

The Effects and Unintended Consequences of the Sarbanes-Oxley Act on the Supply and Demand for Directors

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Using eight thousand public companies, we study the impact of the Sarbanes-Oxley Act (SOX) of 2002 and other contemporary reforms on directors and boards, guided by their impact on the supply and demand for directors. SOX increased directors' workload and risk (reducing the supply), and increased demand by mandating that firms have more outside directors. We find both broad-based changes and cross-sectional changes (by firm size). Board committees meet more often post-SOX and Director and Officer (D&O) insurance premiums have doubled. Directors post-SOX are more likely to be lawyers/consultants, financial experts, and retired executives, and less likely to be current executives. Post-SOX boards are larger and more independent. Finally, we find significant increases in director pay and overall director costs, particularly among smaller firms. (*JEL* D23, G32, G34, G38, K22, M14)

“In response to a loss of confidence among American investors reminiscent of the Great Depression, President George W. Bush signed the Sarbanes-Oxley Act into law on 30 July 2002.”

—Welytok (2006, p. 9)

The Sarbanes-Oxley Act (SOX) became law on 30 July 2002. It was enacted as emergency legislation amid high-profile corporate scandals and is so important that then Securities and Exchange Commission (SEC) chairman William

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Donaldson (Donaldson 2003) before Congress said, “the Act represents the most important securities legislation since the original federal securities laws of the 1930s.” Contemporaneously, the NYSE and NASDAQ adopted new listing standards. Our goal is to examine the effects of SOX and contemporary reforms on the structure and makeup of corporate boards and directors.

In our analysis, we generally refer to SOX and contemporary changes on the major exchanges collectively as SOX for brevity. This is a shorthand for a much more complex phenomenon, of which SOX is central. SOX was adopted in a period of profound concern over the actions of directors, auditors, accountants, and the Self-Regulatory Organizations (SROs—the exchanges). Some of the exchange-rule changes were directly mandated by SOX.¹ Others had been in the works before SOX, although it is likely that their final form was influenced by SOX. Further, SOX imposed other requirements on both directors and SROs. Some requirements were mandated, but there was also as a change in the expectations of how boards and directors (and SROs in dealing with them) should behave.² Finally, changes in boards and directors have been occurring for some time. Linck, Netter, and Yang (2008) and Gordon (2007), for example, document that the proportion of independent directors on boards has been growing for some time. Gordon suggests that it is due to the increasing importance of maximizing shareholder value as the firm’s objective and the greater informativeness of stock prices. In this article, we show that, while these changes are continuing trends, many changes accelerated after SOX.

We examine the effects of SOX using a simple framework of demand and supply for directors. Specifically, demand for directors increased due to various mandates on board composition and workload. The supply of directors decreased due to the increased workload and risks of being a director. Said differently, firms need to pay people more for the position of a director. While we cannot directly trace out the shifts of the curves, we examine the magnitude of the changes caused by these demand and supply shifts on the number and pay of directors (price and quantity). Both demand and supply shifts would increase the price of directors (pay); indeed, director pay does rise dramatically. While the shifts have opposite effects on quantity, some of SOX’s requirements often necessitate that the quantity of directors increases; thus, we expect that the demand effect will dominate. In fact, we find that boards are larger post-SOX.

Further, we examine factors related to the changes in supply and demand for directors including changes in the workload of directors, the structure of corporate boards, the liability risk faced by directors, and the composition of

¹ For example, rules that directed SROs including the NYSE and the NASDAQ to adopt listing standards concerning the composition, independence, and functions of audit committees and to prohibit the listing of any firm that is not in compliance with these rules. See Securities Act Rel. 8220 (9 April 2003).

² The stated goals of these rule changes (taken from the SEC webpage at <http://www.sec.gov/news/press/2003-89a.htm>) are to “Restore Confidence in the Accounting Profession,” “Improve the Tone at the Top,” “Improve Disclosure and Financial Reporting,” “Improve the Performance of Gatekeepers,” and “Enhance Enforcement Tools.”

the director pool. We find evidence of increased workload and liability faced by directors. The composition of the boards also changes with relatively more lawyers and financial experts and relatively fewer executives from other firms than before SOX.

We construct several different samples for our empirical analysis to provide sufficient breadth and depth to identify important time-series and cross-sectional impacts. For example, we study the boards of more than eight thousand firms from 1989 to 2005, providing broad-sample evidence on the impact of SOX and contemporary changes on the major exchanges. We complement our broad-sample evidence with more detailed analysis of smaller subsamples. The breadth and depth of our sample allow for a comprehensive analysis of board-related costs, and the extent to which the costs of these regulatory mandates are uniform across firms.

Our results suggest that SOX dramatically affected corporate boards, their activities, and their costs. Median pay per director rose by more than \$38,000 from 2001 to 2004, an increase of more than 50%. By comparison, CEO pay increased by just 24% over the same time period. The per director pay increase, coupled with the fact that firms also have more outside directors, drove a substantial increase in total director fees paid by firms. Our results also suggest that changes in director pay especially fall on smaller firms, a fact that was exacerbated by SOX given the dramatic post-SOX rise in director compensation. For example, small firms paid \$3.19 as director fees per \$1000 of net sales in 2004, which is \$0.84 more than they paid in 2001 and \$1.21 more than that in 1998. In contrast, large firms paid \$0.32 as director fees per \$1000 of net sales in 2004, seven cents more than they paid in 2001 and ten cents more than that in 1998. Further, the proportion of equity to cash pay rose significantly post-SOX.

Our evidence is also consistent with the notion that directors' workload and risk have significantly increased post-SOX. On average, audit committees met more than twice as often post-SOX as they did pre-SOX, and some firms started to pay audit chair and committee members extra for their services post-SOX. Further, we find that Director and Officer (D&O) insurance premiums increased substantially post-SOX. For example, for a small sample of firms that provide the necessary disclosures—in the United States, D&O insurance disclosures are only required for firms incorporated in New York—median D&O insurance premiums increased by more than 150% from 2001 to 2004.

Board's structure changed dramatically after SOX, and the extent of these changes varies with firm characteristics. Post-SOX boards are larger and more independent. This suggests that a firm is more likely to add outside directors than remove inside directors to meet independence requirements, consistent with the notion that the board's overall workload increased or that insiders serve specific needs. In addition, more firms separate the positions of CEO and Chairman of the Board (COB) post-SOX, particularly the smaller firms.

Not surprisingly, firms with less independent boards pre-SOX increase board's independence more than firms that had more independent boards pre-SOX.

The makeup of the director pool changed substantially post-SOX. Sitting executives make up a significantly smaller fraction of the director pool, while retired executives, directors with financial expertise, lawyers, and academics make up a larger portion. Directors' turnover increased substantially post-SOX, particularly for audit-committee members. Not surprisingly, firms were less likely to add employee and gray directors post-SOX.

While our study examines the specific impacts of SOX on directors and boards, as noted earlier, we recognize that these changes are more broadly a part of a changed landscape for corporate governance. During the time when SOX was deliberated and passed, other significant events were occurring, such as the large drop in stock prices, the start of an economic recession, and a series of corporate scandals. These events influenced the corporate governance landscape, and led to SOX and changes by the major U.S. exchanges. However, we also believe that SOX signifies a turning point; its enactment represents a significant inroad by government into governance. Our results are consistent with the conjecture that firms are making substantial adjustments directly in response to SOX and contemporary changes to the exchange listing rules.

Mulherin (2007, p. 421) cautions researchers against the "naïve modeling of the costs and benefits of regulatory change." One needs a well-grounded theory of regulation applied to the specific regulation, and well-specified tests to have meaningful results on the net costs and benefits from a regulation. Given that we focus on the structure, activities, and costs of boards, and do not measure the benefits, we cannot draw general conclusions about whether these changes, on net, led to better or worse boards overall.³ We do let other work attempting to measure the effects of SOX guide some of the questions we ask. For example, Wintoki (2007) suggests that small firms were adversely affected by SOX; we look at the effects of SOX on different-sized firms. Others have suggested that some firms may be better served by a board that looks different than the one essentially mandated by SOX (see Boone, Field, Karpoff, and Raheja 2007; Coles, Daniel, and Naveen 2008; Linck, Netter, and Yang 2008). While we do not determine the optimal board's structure, we do analyze the changes in board's structure associated with SOX. Hopefully, this article, in combination with other work, will enable us to have a more broad understanding of the overall costs and benefits of SOX.

Ours is not an estimate of the overall costs and benefits of regulation and thus its value. However, while we cannot measure the benefits of firms being required to have more directors, working them harder, and paying them more, we show that those are the real effects of SOX. At least in terms of extra pay, this was not a "benefit" ever mentioned by legislators drafting the bill, and may

³ For further discussion of the potential long-term benefits of SOX, see Coates (2007). Coates does note that "the law's (SOX's) full costs are hard to quantify, and the benefits even harder, so any honest assessment of Sarbanes-Oxley must be tentative and qualitative."

well be an unintended consequence of legislation allegedly meant to correct poor performance by directors.

The rest of the article is organized as follows. We provide an overview of SOX and develop the hypotheses in Section 1. Section 2 describes our data. In Section 3, we examine director compensation and factors affecting the supply and demand for directors. We examine the impact of SOX on board's structure in Section 4 and on the director pool in Section 5. We summarize and conclude in Section 6.

1. Overview of SOX and Research Questions

Some legal scholars argue that, reacting to a financial crisis, Congress adopted the Sarbanes-Oxley Act very quickly, and without much consideration (Romano 2005; Bebchuk and Hamdani 2006).⁴ Romano (2005) also notes that SOX represents a fundamental change in the law and the mode of regulation. It moves federal regulation into mandates for corporate governance, rather than the traditional disclosure requirements. The SEC moves into areas that had been exclusively regulated by the states. Romano goes on to describe the congressional activity in great detail, but suggests that the Act is made up of "proposals of policy entrepreneurs with neither careful consideration nor assimilation of the literature at odds with the policy prescriptions" (Romano 2005, p. 1602). Our focus is on analyzing the effects of SOX on corporate boards and directors, thereby contributing to the ongoing debate of the effect and potential refinement of this legislation.⁵ Next, we review SOX provisions, highlighting those that are most relevant for this article, lay out our research questions, and summarize the related literature.

1.1 The Sarbanes-Oxley Act and board-related rule requirements

SOX was intended to be a comprehensive solution to the type of corporate malfeasance that led to the spectacular downfalls of firms such as Enron and WorldCom. SOX has five main objectives: (1) to strengthen the independence of auditing firms, (2) to improve the quality and transparency of financial statements and corporate disclosure, (3) to enhance corporate governance, (4) to improve the objectivity of research, and (5) to strengthen the enforcement of the federal securities laws.⁶ The emerging research on SOX has provided some evidence on whether SOX has successfully achieved its first two objectives. Our article primarily addresses the third objective, to enhance corporate governance, by examining the impact on corporate boards. Our approach comes

⁴ Interestingly, the 1933 Act was written in a long weekend by three recent Harvard law graduates appointed by Felix Frankfurter (later Supreme Court Justice) under directions from the new President Roosevelt to do something. Congress passed it within a month (Alter 2006, p. 278).

⁵ For example, the Committee on Capital Markets Regulation was created on 12 September 2006. It calls for cost-benefit analysis of SOX and has made recommendations to relax some of SOX's requirements.

⁶ The Practitioner's Guide to the Sarbanes-Oxley Act, Volume 1, The American Bar Association, 2004.

from the way that SOX attempted to enhance corporate governance which is by promoting board's independence and imposing new obligations and responsibilities on the audit committee.

In an attempt to meet SOX's objective of enhancing corporate governance, the law promotes board's independence and imposes new obligations and responsibilities on the audit committee. Contemporaneously, the NYSE and the NASDAQ adopted new listing requirements. The major governance provisions mandated by SOX and the SROs include⁷

- The board of directors of each NYSE- and NASDAQ-listed firm must have a majority of independent directors.⁸
- The independent director must meet a refined definition of independence.
- The compensation and the nominating/governance committees must consist entirely of independent directors.
- The audit committee must have a minimum of three members and consist entirely of independent directors. In addition, each member of the audit committee must be financially literate. One member must be an "audit committee financial expert," or the company must disclose that it does not have such an expert and why not.

1.2 Research questions

Leading and pursuant to SOX, significant changes were occurring in the economy, including a declining stock market, a series of corporate scandals, elevated shareholder activism, and increased public awareness of corporate governance. Thus, we recognize that our analysis with respect to SOX is part of a broader change in the corporate governance landscape. Further, Romano (2005, p. 1523) argues that many of the provisions of SOX "may more accurately be characterized as recycled ideas advocated for quite some time by corporate governance entrepreneurs." These arguments suggest that some of the post-SOX trends may have begun before SOX was enacted. Even so, we believe that SOX signifies a turning point in the corporate governance landscape and expect to see firms making substantial adjustments directly in response to it. Thus, we form our empirical predictions based on the specific requirements of SOX and rule

⁷ For more details on the Sarbanes-Oxley Act of 2002 and the governance proposals of the NYSE and NASDAQ, refer to Public Law 107-204 (30 July 2002), The Practitioner's Guide to the Sarbanes-Oxley Act, the SEC Release No. 34-48745, File Nos. SR-NYSE-2002-33, SR-NASD-2002-77, SR-NASD-2002-80, SR-NASD-2002-138, SR-NASD-2002-139, and SR-NASD-2002-141. For summaries, refer to Engel, Hayes, and Wang (2005) and Chhaochharia and Grinstein (2007).

⁸ SOX primarily focuses on the audit committee of public companies. Section 301 (Public Company Audit Committees) requires that each member of the audit committee be independent. The rule changes adopted by the NYSE and NASDAQ require firms to have majority of independent boards and entirely independent compensation and nominating/governance committees. In general, the NYSE and NASDAQ rules share many commonalities, but there are some differences. Overall, the NASDAQ rules offer greater flexibility. For example, NASDAQ allows firms to either (1) have an independent compensation or an independent nominating/governance committee or (2) have a majority of independent directors to perform the corresponding committee duties. The new governance rules have no mandates regarding board size or separation of the CEO and COB positions. In addition, certain entities are exempted from the new rules, including controlled companies, limited partnerships, companies in bankruptcy, mutual funds, and certain other passive business organizations.

Table 1
Summary of predictions and results

Attributes	Mandated	Likely	Possible	Findings
<i>Workload and pay</i>				
Increased director workload		X		Meeting frequency increases Some directors hold fewer outside directorships; others are in greater demand Independent directors sit on more board committees
Increased director risk		X		D&O insurance premium increases
Increased director pay		X		Director pay and proportion of incentive pay increases Option awards are a smaller fraction of director pay post-SOX Director pay increases are larger than CEO pay increases Directors receive a larger portion of pay in options than do CEOs
Disproportionate impact on small firms			X	Pay increase is relatively greater for small firms Independent directors of small firms serve on disproportionately more board committees than those of large firms
<i>Board's structure</i>				
Increased board independence	X			Proportion of outsiders on the board and proportion of firms with a majority independent directors increase Firms not previously compliant with SOX increase board's independence more
Increased board size			X	Firms add outsiders more than remove insiders to comply with SOX Firms not previously compliant with SOX increase board size more
Reduction in CEO duality			X	Fewer CEOs are also COB
Disproportionate impact on small firms			X	Small firms increase board's independence more than large firms
<i>Director pool</i>				
Increased director turnover	X			Directors' turnover increases
Director backgrounds				
More financial experts	X			Boards include more financial experts
More lawyers			X	Boards include more lawyers
Fewer current executives	X			Boards include fewer current executives, more retired executives
Fewer directorships per director			X	Some directors holder fewer directorships others are in greater demand

The table summarizes board- and director-related attributes that we examine in the article. We classify each as whether the attribute is effectively Mandated to change by SOX or the exchange-rule changes, Likely to be impacted by the rule changes, or a Possible consequence of the legislation. We report our results under Findings.

changes mandated by the exchanges. We summarize our predictions in Table 1 and briefly discuss them below.

SOX charges directors with more duties, specifies directors' responsibilities in greater detail, and directs directors to focus more on process. Hence, we expect board workload to increase and board tasks to become more complex post-SOX ("The Great American Corporate Director Hunt," *Institutional Investor*,

12 April 2005; “More CEOs Say ‘No Thanks’ to Board Seats,” *The Wall Street Journal*, 28 January 2005). We also expect director risk to increase post-SOX, raising D&O insurance premiums. While SOX does not specifically alter the substantive laws regarding director liabilities, we expect that certain aspects of SOX have increased director risk. For example, Section 804 of the Act provides for a longer statute of limitations for security claims, giving private litigants additional time to discover and file for claims (“Increased Risk of Personal Liability for Outside Directors,” *Directors Monthly*, 1 July 2004). Further, we believe that the combined effects of SOX, recent court decisions in favor of shareholder plaintiffs, public scrutiny of corporate fraud, and other contemporaneous events have led to a substantial increase in the risk faced by directors. For example, several court decisions shortly after SOX expand director liabilities for breaches of fiduciary duties, signaling a trend toward stricter judicial scrutiny of director decision-makings.⁹ Some legal scholars interpret this change in jurisprudence as states’ attempt to preempt further federal intrusion into state corporate governance (Coffee 2003; Jones 2004). SOX also increased the SEC’s budget from \$437 million in 2002 to \$776 million in 2003. Some evidence suggests that the SEC has increased scrutiny of directors post-SOX, raising concerns that more directors will face sanctions and reprimands by the agency (“Does a lawsuit that forced former WorldCom board members to pay their own money to angry shareholders mean that directors are now. . . BIGGER TARGETS?” *The Plain Dealer*, 8 January 2005). In January 2005, directors of Enron and WorldCom had to pay over \$20 million in personal funds to settle shareholder lawsuits. Although these settlements create no legal precedent, the size of the payments that those directors made out of their own pocket is unusual. Indeed, Richard Breeden, former SEC chairman, refers to it as a “watershed development” that “will send a shudder through boardrooms across America and has the potential to change the rules of the game.”¹⁰

Given the increased workload and risk, board candidates may be more reluctant to sit on corporate boards. Additionally, some directors may drop out of the supply pool as they fail to qualify as independent directors under the new

⁹ Veasey (2004), Klughaupt (2006), and Grossman (2007) discuss the effect that cases such as Disney, Cogan, Abbott, Oracle, etc., have on director liability (*In re The Walt Disney Co. Derivative Litig.*, 825 A.2d 275 (Del. Ch. 2003); *Pereira v. Cogan*, 294 B.R. 449 (S.D.N.Y. 2003); *In re Abbott Laboratories Derivative S’holder Litig.*, 325 F.3d 795 (7th Cir. 2003); *In re Oracle Corp. Derivative Litig.*, 824 A.2d 917 (Del. Ch. 2003)). Also see “Increased Liability for Directors and Officers,” by Herbert Henryson, *Mondaq Business Briefing*, 3 June 2004; “Enron and WorldCom Settlements Reflect Need to Reexamine Director Liability Standards,” by David E. Brown Jr. and Michael P. Reed, *Corporate Officers and Directors Liability Reporter*, 16 May 2005; “Developments in Director Responsibilities,” by Geoffrey R. Morgan, *Wall Street Lawyer*, September 2003. William B. Chandler, Chancellor of the Delaware Court of Chancery, notes, “a fiduciary’s duties do not change over time. How we understand those duties may evolve and become refined. . .” [*In re The Walt Disney Co. Derivative Litig.*, Civ. A. No. 15452, 2005 WL 1875804 (Del. Ch. 9 Aug. 2005)].

¹⁰ “Tracking the Numbers/Outside Audit: WorldCom’s Steep Price—Outside Directors’ Failures Send Expensive Lessons On the Cost of Inattention,” by Jonathan Weil and Shawn Young, *The Wall Street Journal*, 7 January 2005, Page C1. Also see “10 Ex-WorldCom Directors Agree to Settlement,” by Brooke A. Masters and Kathleen Day, *The Washington Post*, 6 January 2005; “Director Liability,” an edited transcript of a forum on personal liability of directors held at Harvard Law School in November 2005, by Bebchuk et al. (2006).

definition of “independent directors.” Taken as a whole, we expect the supply of qualified directors to decrease and demand to increase post-SOX. Therefore, we expect companies to pay more to lure qualified directors post-SOX. Further, SOX Section 402 prohibits all loans to directors, which may require substitute compensation. We expect SOX to have the most dramatic impact on the pay and workload of audit-committee members given Section 404, as well as specific requirements on audits and audit committees. SOX Section 404 requires a company’s management and auditors to report on the effectiveness of internal controls over financial reporting. It is widely viewed as the single most expensive piece of SOX (“The Limitations of the Sarbanes-Oxley Act,” *USA Today*, 1 March 2005; CNNfn, 30 July 2004). To proxy for workload, we examine the meeting frequency for the board and its committees, as well as the number of directorships a director holds.

Some of SOX’s compliance costs are likely fixed. For example, board size does not increase linearly with firm size, so increases in director compensation may be relatively more burdensome for smaller firms. In light of this, Holmstrom and Kaplan (2003) argue that SOX will have a more negative effect on smaller companies than on larger ones. Thus, we expect the board-related costs of SOX to be disproportionately higher for smaller firms.

Gordon (2007) and Linck, Netter, and Yang (2008) show that the trend toward more independent boards predates SOX. However, given that SOX includes specific independence-related requirements, we expect the trend toward independence to accelerate after SOX. Firms can choose to meet the independence requirements by either adding outside directors or removing inside directors. Which method they choose is an empirical question. However, if the overall workload of the board increased or if insiders serve specific needs, then we expect to see that firms add outside directors more than they remove inside directors to meet the independence requirements, increasing the overall board size. Further, to the extent that smaller firms are less likely to be compliant with SOX (Lehn, Patro, and Zhao Forthcoming; Boone et al. 2007; Linck, Netter, and Yang 2008), we expect their board’s independence to increase disproportionately more than for larger firms.

Since SOX has specific mandates on director qualifications, board’s structure, and some of its committees, many public companies will have to restructure their boards to comply with the new regulations, removing unqualified directors and adding qualified ones. The reforms and increased public scrutiny on governance practice may also drive companies to reevaluate the skill sets that they need from directors, leading to changes in board members.¹¹ Further, faced with increased workload and risk, directors may reevaluate their

¹¹ For example, during a hearing on SOX held by the House Committee on Financial Services, the CEO of E*Trade, Mitchell Caplan, testified that the compliance process with SOX has led the firm to reassess the skill set that it needs for board members. In the end, E*Trade separated the titles of COB and CEO, revamped the audit and compensation committees, and brought on four new members to the board of directors (Political Transcripts by Federal Document Clearing House, 22 July 2004).

decisions to serve. These arguments suggest that directors' turnover will increase post-SOX. In addition, SOX creates demand for certain types of directors (e.g., directors with financial expertise). These factors are likely to drive a change in the composition of the director pool.

2. Data Description

We use three primary samples to explore the impact of SOX on corporate boards: a "Disclosure" sample, an "IRRC" sample, and a random sample of small, medium, and large firms for which we hand-collect detailed data (the "random" sample). Disclosure contains director, financial, and ownership information for all publicly traded companies that file with the SEC.¹² Our Disclosure sample begins in 1989. One criticism of SOX is its blanket imposition of governance requirements on all public firms, possibly resulting in a disproportionate burden for small firms (Morgenstern and Nealis 2004). We are able to assess the validity of this claim using the Disclosure sample, since it contains most public firms, large and small.

Albeit comprehensive in the firms covered, Disclosure lacks some important board attributes, such as committee structure and detailed descriptions of each board member. In contrast, the Investor Responsibility Research Center (IRRC) data include committee information and more detailed classifications of directors, among other things. However, it covers only S&P 1500 firms for a shorter time period. Further, IRRC begins coverage of some board characteristics only after 1998. By construct, the IRRC firms are, on average, significantly larger than the Disclosure sample firms. Indeed, as of 2004, only 2 of the 1141 IRRC firms have a market capitalization of less than \$75 million.

We also assemble a third sample of ninety firms for more detailed analysis. We form this sample by first placing each firm into one of three market value groups using cutoffs of \$75 and \$700 million as of 2002 (SOX uses these break points in providing firm breaks on certain compliance deadlines). We then randomly choose thirty firms from each size group, and hand-collect detailed information from their proxy statements for 1998, 2001, and 2004.

Table 2 reports the annual number of observations, as well as the mean and median market value of equity (in 2004 millions of dollars) across our three samples. There are a total of 62,694 firm-year observations representing 8327 unique firms in the Disclosure sample for the sample period of 1989–2005. The IRRC sample includes 12,022 firm-years from 1996 to 2005 representing 2209 unique firms, and our random sample covers 90 unique firms for 1998, 2001, and 2004.¹³ The IRRC sample firms are, on average, substantially larger

¹² For more information about the Disclosure database and the sample collection process, please see Linck, Netter, and Yang (2008).

¹³ To provide a complete picture, we use the maximum available time series when possible. However, we focus many of our tests on the 1998–2004 period to allow approximately equal time pre- and post-SOX.

Table 2
Sample description

	Disclosure sample			IRRC sample			Random sample		
	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median
	(Market value of equity in millions)								
1989	2,424	976	72						
1990	2,610	1,045	68						
1991	2,699	983	59						
1992	2,923	1,219	96						
1993	3,295	1,149	97						
1994	3,791	1,108	106						
1995	4,056	1,028	96						
1996	3,991	1,328	124	1,006	4,825	1,256			
1997	4,391	1,501	138	1,152	5,104	1,112			
1998	4,758	1,832	143	1,319	6,099	1,249	90	2120	257
1999	4,602	2,429	127	1,332	7,834	1,168	90	3759	191
2000	4,426	2,772	155	1,318	8,610	1,379	90	5045	204
2001	4,242	2,594	132	1,387	7,701	1,220	90	3391	259
2002	3,882	2,435	167	1,119	7,730	1,347	90	3765	296
2003	3,813	2,016	135	1,133	6,133	1,131	90	2761	287
2004	3,522	2,729	283	1,137	7,558	1,554	90	3795	374
2005	3,269	3,037	345	1,119	7,436	1,733			
Number of firm-years	62,694			12,022			630		
Number of unique firms	8,327			2,209			90		

The table lists the annual number of firms, and the mean and median market value of equity for the three samples: (i) the Disclosure sample, (ii) the IRRC sample, and (iii) the random sample. Market value of equity is expressed in millions of 2004 constant dollars. The Disclosure sample is based on the universe of firms in the Disclosure database, after excluding (1) foreign firms, (2) regulated firms (financial and utility firms or equivalently firms with SIC Codes of 49 and 60–69), (3) firms that have information on board size and board composition for less than two years in Disclosure, and (4) firms that are missing total assets (Compustat) or monthly stock returns (CRSP). The IRRC sample is based on the universe of firms in the IRRC database, after excluding (1) regulated firms and (2) firms that are missing total assets (Compustat) or monthly stock returns (CRSP). The random sample is formed by ranking all the Disclosure firms into three size groups based on the market value of equity and randomly choosing thirty firms from each group.

than those in both the Disclosure and random samples. In 2004, the median market value of equity for the Disclosure, IRRC, and random samples are \$283 million, \$1.55 billion, and \$374 million, respectively.

3. Evidence of Director Compensation and Factors Affecting the Supply and Demand for Directors

In this section, we first examine how director compensation changed from before to after SOX. Director compensation essentially measures the overall impact of changes in the supply and demand for directors. We then analyze other factors that drove these changes, including directors' workload, D&O insurance premiums, and changes to the director pool. Given the detailed information required, we use the IRRC and random samples for most of this analysis (director pay data are not available for the Disclosure sample).

3.1 Changes in director compensation

In this section, we examine the change in director pay around SOX for the IRRC and random samples. Due to data availability, cash compensation for the IRRC sample includes only the annual cash retainer and fees paid to directors for attending general board meetings. For the random sample, we are able to include attendance fees for committee meetings plus any additional cash compensation paid to lead directors, the chairman of the board, committee chairs, and certain committee members. For both samples, equity pay includes option and stock grants. Pay numbers are expressed in 2004 constant dollars.¹⁴

Table 3 reports univariate pay results for the IRRC and random samples.¹⁵ For the IRRC sample, the median total compensation per director rose substantially from \$57,514 in 1998 to \$74,488 in 2001 (a 30% increase) and to \$112,745 in 2004 (a 51% increase), both statistically significant changes. The increase in cash pay was significantly higher post-SOX while equity-based pay rose significantly in both the pre- and post-SOX period. These findings are consistent with Farrell, Friesen, and Hersch (2008), who find that director pay increased dramatically from 1998 to 2004, particularly in the form of equity pay. The table also reports pay scaled by the market value of equity. By this metric,

¹⁴ Following Bryan and Klein (2004), we do not include option awards upon initial election since these one-time grants would distort our compensation comparison across years (which may be exacerbated by the "lucky grant" concern reported by Bebchuk, Grinstein, and Preyer 2006). If directors join the board mid-year, we assume that they receive the compensation for the entire year. We also do not consider outlays such as insurance plans (term life insurance, accident, etc.), retirement plans, and charity matching contribution. Further, we do not include D&O insurance in our compensation numbers, but do analyze it separately below. For the IRRC sample, we gather pay data from the IRRC and ExecComp databases. For the random sample, we collect pay data from proxy statements. We use stock price data from CRSP. To compute the value of option grants, we use the Black-Scholes (1973) method and assume that option grants are at the money with a seven-year maturity and that the grant price is the closing stock price from the previous fiscal year (Aggarwal and Samwick 1999; Core and Guay 2002; Ryan and Wiggins 2004). To compute the value of stock grants for directors, we multiply the number of shares granted by the closing stock price from the previous fiscal year (Ryan and Wiggins 2004).

¹⁵ We report medians because option pay includes several large outliers that distort mean pay measures.

Table 3
Director compensation

Panel A: Median director pay for the IRRC sample					
	<i>N</i>	Cash pay (\$)	Equity-based pay (\$)	Total pay (\$)	Total director pay per MVE (in \$000)
1998	1,087	29,797	25,113	57,514	0.353
1999	1,102	29,328	31,580	63,396	0.391
2000	1,101	29,800	31,927	65,119	0.390
2001	1,129	28,820	41,827	74,488	0.450
2002	1,108	29,827	40,481	74,216	0.436
2003	1,103	33,215	59,539	95,623	0.673
2004	1,075	37,500	70,216	112,745	0.559
2005	1,041	39,647	68,448	112,723	0.492
% Change _{1998–2001}		–3.3%	66.6%***	29.5%***	27.4%***
% Change _{2001–2004}		30.1%***	67.9%***	51.4%***	24.2%***
% Change _{2001–2004 vs. 1998–2001}		33.4%***	1.3%	21.8%***	–3.2%***

Panel B: Median CEO pay for the IRRC sample					
	<i>N</i>	Cash pay (\$)	Equity-based pay (\$)	Total pay (\$)	CEO pay per MVE (in \$000)
1998	1,063	1,031,440	1,060,970	2,421,890	1.656
1999	1,091	1,068,780	1,230,250	2,642,480	1.984
2000	1,101	1,083,410	1,393,140	2,953,470	2.100
2001	1,123	929,813	1,608,180	2,931,010	2.058
2002	1,105	995,920	1,422,470	2,717,240	2.277
2003	1,095	1,089,450	1,814,640	3,134,130	1.871
2004	1,064	1,258,350	2,038,350	3,637,370	1.761
2005	1,034	1,275,480	1,974,670	3,679,990	1.857
% Change _{1998–2001}		–9.9%***	51.6%***	21.0%***	24.3%***
% Change _{2001–2004}		35.3%***	26.7%***	24.1%***	–14.4%***
% Change _{2001–2004 vs. 1998–2001}		45.2%***	–24.8%***	3.1%	–38.7%***

(continued overleaf)

Table 3
(Continued)

Panel C: Median director pay for the random sample

		Cash pay per director	Equity-based pay per director (\$)	Total pay per director (\$)	Director pay per net sales (in \$000)	Director pay per MVE (in \$000)
Small firms ($n = 30$)	1,998	6,848	0	12,839	1.98	1.40
	2,001	13,877	0	18,813	2.35	3.72
	2,004	13,875	5,247	20,054	3.19	4.46
Medium firms ($n = 30$)	1,998	16,689	6,502	26,359	1.02	0.53
	2,001	20,815	14,435	50,195	1.23	0.71
	2,004	30,000	32,489	63,488	2.05	0.85
Large firms ($n = 30$)	1,998	36,036	25,559	63,534	0.22	0.18
	2,001	37,944	40,209	87,078	0.25	0.24
	2,004	56,190	58,746	121,264	0.32	0.28

The table reports median director (panel A) and CEO pay (panel B) for the IRRC sample, and median director pay for the random sample (panel C). For the IRRC sample, cash pay equals annual cash retainer plus meeting fees times the number of board meetings. Equity-based pay consists of the value of option and stock grants. We use the Black-Scholes (1973) method to compute the value of option grants assuming that grants are at the money with a seven-year maturity and a grant price equal to the closing stock price at the previous fiscal year-end. The value of stock grants equals the number of shares granted times the closing stock price at the previous fiscal year-end. Total pay is the sum of cash pay and equity-based pay. CEO cash pay includes salary and bonus. CEO equity-based pay consists of the value of option and stock grants. We value CEO stock and option pay in the same manner as for directors. CEO total pay is the sum of cash pay, equity-based pay, long-term incentive pay, and other annual payments. All pay levels are expressed in 2004 constant dollars. For the random sample, cash compensation includes the annual retainer and board meeting fees, plus fees paid to directors for attending committee meetings and any additional amount paid to lead directors, chairmen of the board, committee chairs, and certain committee members. For the IRRC sample, 8746 firm-year observations have the necessary data for the director pay calculation, and 8676 for the CEO pay calculation. *** indicates the significance of a Wilcoxon two-tailed test at the 1% level, respectively.

Comparison between Director and CEO Incentive Pay

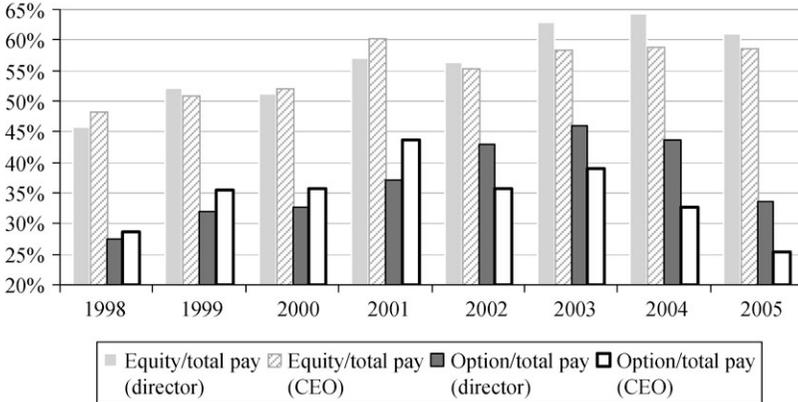


Figure 1
Time trends of equity-based pay between directors and CEOs from 1998 to 2005

This figure illustrates the median ratio of option pay over total pay (option/total pay) and equity-based pay over total pay (equity/total pay) for the directors and CEOs in the IRRC sample from 1998 to 2005. Equity-based pay is the sum of option and stock awards. Total pay is the sum of cash pay and equity-based pay. We use the Black-Scholes (1973) method to compute the value of option grants assuming that grants are at the money with a seven-year maturity and the grant price is the closing stock price from the previous fiscal year. The value of stock grants equals the number of shares granted times the closing stock price from the previous fiscal year. The data used for this analysis come from ExecuComp, IRRC, CRSP, and Compustat. There are 8746 firm-year observations that have the necessary data for the director pay calculation, and 8676 for the CEO pay calculation.

director pay increased by a similar amount pre- and post-SOX, 27% and 24%, respectively, suggesting that some of the increase in pay post-SOX was driven by increases in market value. This is consistent with the observation that market returns, on average, were higher in the post-SOX period than pre-SOX, coupled with the fact that directors are getting a larger portion of their pay in the form of options.

For comparison, we report median CEO pay in panel B of Table 3. The change in total CEO pay was relatively more modest than that in director pay, both in absolute terms and when scaled by market value. The median CEO pay rose from \$2.4 million in 1998 to \$2.9 million in 2001 (a 21% increase) and to \$3.6 million in 2004 (a 24% increase). When scaled by market value, CEO pay increased by 24% pre-SOX and decreased by 14% post-SOX. The decrease in CEO pay scaled by market value is consistent with the fact that the proportion of the incentive-based pay for CEOs decreased post-SOX and market returns, on average, were higher in our post-SOX period than in our pre-SOX period. For example, Cohen, Dey, and Lys (2007) argue that SOX increased the risk to CEOs. Firms responded by reducing CEO incentive pay to provide additional insurance to the CEOs. Overall, panels A and B of Table 3 show that director pay increased significantly since 1998, particularly post-SOX, and the post-SOX increases are relatively larger than the increases observed for CEO pay.

Figure 1 compares the median proportion of equity-based pay for CEOs and directors from 1998 to 2005. The proportion of director pay provided by

equity increased from around 45% in 1998 to over 60% post-SOX. The ratio dropped slightly from 2004 to 2005, but is still above 60%. For CEO pay, the pre-SOX trend is similar; however, it appears that the trend reversed post-SOX, consistent with Cohen, Dey, and Lys (2007). The trends appear similar, albeit somewhat more dramatic, when we break out just the option component of equity pay. In untabulated results, we tested whether the proportion of pay provided by equity (and of just options) was significantly different between directors and executives. We find that pre-SOX the proportion of equity pay for CEOs was either larger than or insignificantly different from that for directors. In contrast, post-SOX we find that the proportion of pay that comes from equity is significantly higher for directors than that for CEOs.

Panel C of Table 3 summarizes director pay for the random sample. Given the small sample size in each size group, this is meant to be descriptive. Consistent with the IRRC sample results, director compensation—both cash and equity components—increased significantly from 1998 to 2004. Over this period, cash compensation for nonemployee directors increased by 103%, 80%, and 56% for small, medium, and large firms, respectively. The increase in director cash pay is primarily due to the increase in the annual retainer and the increase in the number of committee meetings. In untabulated results, we also find that seven large firms, five medium firms, and six small firms began paying extra compensation to the chair or members of the audit committee post-SOX, while we detected no such practice pre-SOX. Large (medium, small) firms paid, on average, \$10,000 (\$5000, \$3750) more to audit chairs than to other directors (not reported in the table).

The per director pay numbers do not incorporate the differential impacts that the rule changes may have on board size and composition. Thus, to better assess the relative cost of director pay, we estimate total director pay per \$1000 in net sales and per \$1000 of market value.¹⁶ For small firms, total pay per \$1000 in net sales rose from \$1.98 in 1998 to \$2.35 in 2001 to \$3.19 in 2004. The increase from 2001 to 2004 appears economically large at \$0.84 (36%), but is not statistically significant, possibly due to our small sample size. For medium (large) firms, the corresponding numbers rose from \$1.02 (\$0.22) in 1998 to \$1.23 (\$0.25) in 2001 and to \$2.05 (\$0.32) in 2004. Again, the changes are not statistically significant. The trends are similar when we examine pay scaled by the firm's market value of equity.

In sum, board compensation increased substantially post-SOX. Further, the results suggest that director pay is disproportionately costly for smaller firms, a fact that appears to have been exacerbated by SOX given the dramatic post-SOX rise in demand for directors. In 2004, small firms paid directors \$1.14 more per \$1000 in sales than medium firms (56% higher) and \$2.87 more than large firms (almost ten times more). The results are consistent with the notion

¹⁶ When we use the term "cost," we are referring to the overall economic cost. For example, increased pay may not be a cash flow if it can be paid with noncash instruments, such as stock and options. However, the overall economic cost is still borne by the firm's shareholders.

that it is relatively more expensive for small firms to hire qualified directors than for large firms.

3.2 Director compensation

In this section, we analyze the impact of SOX on director compensation in a multivariate framework, controlling for the economic factors that the existing literature has suggested drive director pay. As an initial examination of whether the level of total pay and the proportion that comes from options change post-SOX, we employ the following model specifications:

$$\begin{aligned} \text{Log}(\text{Total_pay}) = f(\text{POSTSOX}, \text{ROA}, \text{Stock return}, \text{R\&D}, \text{Firm size}, \\ \text{Director ownership}, \text{Log}(\text{CEO tenure}), \\ \text{CEO ownership}, \text{firm fixed effects}), \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Option/total_pay} = f(\text{POSTSOX}, \text{R\&D}, \text{Firm risk}, \text{Firm size}, \\ \text{Director ownership}, \text{Log}(\text{CEO tenure}), \\ \text{CEO ownership}, \text{Total debt / total assets}, \\ \text{zero dividend dummy}, \text{Tax loss carry} \\ \text{—forward dummy}, \text{firm fixed effects}). \end{aligned} \quad (2)$$

Total_pay is the sum of cash and equity pay per director; equity pay includes option and stock awards. We select the control variables based on the contracting and managerial-power theories (Jensen and Murphy 1990; Hermalin and Weisbach 1998; and Bebchuk, Fried, and Walker 2002). The contracting theory predicts relations between pay and firm performance, job complexity, leverage, and ownership. The managerial-power theory predicts relations between pay and CEO negotiation power.¹⁷ We use industry-adjusted ROA (*ROA*) and market-adjusted stock returns (*Stock return*) to measure firm performance,

¹⁷ Since shareholders do not observe managers' actions, Holmstrom (1979) argues that compensation needs to tie managers' pay to firm performance. Holmstrom also predicts that incentive pay should positively correlate with information asymmetry of the firm. In this light, Smith and Watts (1992) argue that growth firms require more incentive pay since they are harder to value. The contracting theory also predicts that managers of large firms will be paid more because they oversee more resources. Additionally, compensation, as just one element of the nexus of contracts, interacts with other contracting mechanisms like capital structure and ownership structure. For example, Mehran (1995) documents a negative relation between incentive pay and stock ownership, and John and John (1993) show that levered firms have low pay-performance sensitivity. In contrast to the contracting theory, the managerial-power theory (Hermalin and Weisbach 1998; Bebchuk, Fried, and Walker 2002; Bebchuk and Fried 2003) views compensation as the manifestation of agency problems (i.e., self-serving managers have negotiation power over the board of directors in setting their own pay). Consistent with this argument, Bebchuk, Cremers, and Preyer (2007) find that powerful CEOs (proxied by CEO tenure, whether CEO is the COB, and antitakeover provisions) receive higher pay. Ryan and Wiggins (2004) also find that firms with less independent boards pay their directors less incentive pay. For more details regarding the compensation literature, please see Murphy (1999) for a general survey on executive pay and Core, Guay, and Larcker (2003) for a survey focusing on equity-based pay.

research and development (*R&D*), and the log of market value of equity (*Firm size*) to proxy for job complexity, *CEO tenure* to proxy for the CEO's bargaining power, and director and CEO ownership to proxy for potential substitution between the incentive-alignment effect provided by compensation contract and the incentive-alignment effect provided by an ownership stake.

We also include firm fixed effects to control for unobserved firm-level heterogeneity. Firm fixed effects will capture the effect of firm characteristics that do not change substantially over time. Since many of our control variables are unlikely to change dramatically over our time series, this specification may reduce the explanatory power of our firm characteristics, but should not impact our estimate of SOX effect, which is largely a time-series prediction. We view this as a reasonable trade-off since we are primarily concerned with the impact of SOX. Nevertheless, we perform robustness checks using alternative specifications (including industry fixed effects, but no firm fixed effects; controlling for firm-level clustering (Petersen 2008), including random effects). The results of these robustness checks do not alter our conclusions with respect to the impact of SOX.

In the models that examine the proportion of pay provided by options, we also include a *zero dividend dummy*, which equals one if a firm pays no dividend, to proxy for firms' cash constraints, and a *tax loss carry-forward dummy*, which equals one if a firm has a net operating loss carry-forward (NOLs), to capture the tax advantages of option and stock pay (Yermack 2004). Yermack argues that option pay provides tax advantages because the option holder's tax liability net of the corporation's tax deduction has lower present value compared to cash pay. He argues that the same tax advantage for option awards may also apply to stock awards, albeit to a lesser degree.

Table 4 presents the results. We use the panel data technique and the method of restricted maximum likelihood to estimate models (1), (3), and (4). Since about one quarter of sample firms do not grant option awards, we estimate Tobit models to account for the fact that the dependent variable is censored at zero in model (2). Consistent with our hypotheses and earlier univariate results, we find that SOX dummy (*POSTSOX*) is positively related to both the level and the change in director pay and the option component thereof.

As expected, firm size is significantly and positively related to total pay and incentive pay, while growth opportunities (*R&D*) are significantly and positively related to incentive pay. Results for our other control variables are generally consistent with expectations and the prior literature. Stock performance is positively correlated with total director pay, and CEO ownership is negatively related to total director pay. John and John (1993) suggest that levered firms award less equity compensation to mitigate the agency costs of debt. We do not find support for this with respect to director pay as the coefficient on leverage (*Total debt/total assets*) is indistinguishable from zero. However, this may be due to the fact that this variable does not change substantially over our time series. Indeed, in untabulated results, we find this variable significant and of

Table 4
The impact of SOX on director compensation

Independent variables	(1) Log (total_pay)	(2) Option/total_pay	(3) Δ Log(total_Pay)	(4) Δ Option/total_pay
POSTSOX	0.263*** (<0.001)	0.044*** (<0.001)	0.284*** (0.003)	0.093** (0.029)
POSTSOX* Firm size			-0.026** (0.018)	-0.016*** (0.001)
POSTSOX* R&D			0.249 (0.392)	0.176 (0.169)
POSTSOX* Δ Workload			-0.001 (0.895)	0.004 (0.139)
POSTSOX* Stock return			0.120*** (0.001)	0.051*** (0.000)
POSTSOX* Firm risk			-0.275 (0.214)	0.060 (0.609)
ROA	-0.003 (0.954)		-0.107 (0.113)	
Stock return	0.055*** (<0.001)		0.138*** (<0.001)	
R&D	-0.079 (0.819)	0.307* (0.096)	-0.258* (0.086)	-0.004 (0.952)
Firm risk		-0.021 (0.747)		-0.135* (0.059)
Firm size	0.338*** (<0.001)	0.080*** (0.001)	0.028*** (0.001)	0.007*** (0.009)
Director ownership	-0.317 (0.443)	0.226 (0.434)	0.216 (0.561)	-0.055 (0.758)
Log (CEO tenure)	-0.007 (0.554)	-0.005 (0.528)	-0.001 (0.897)	-0.001 (0.721)
CEO ownership	-0.569*** (0.005)	0.089 (0.501)	0.046 (0.704)	0.015 (0.743)
Total debt/total assets		-0.070 (0.161)		-0.020 (0.322)
Zero dividend dummy		0.103*** (0.001)		0.007 (0.387)
Tax loss carry-forward dummy		0.015 (0.406)		0.002 (0.790)
Δ Workload			0.017*** (<0.001)	-0.008*** (<0.001)
Δ ROA			0.157** (0.054)	-0.015 (0.777)
Δ Stock return			0.067*** (<0.001)	0.016*** (0.001)
Δ R&D			-0.427 (0.137)	-0.029 (0.831)
Δ Firm risk			-0.096 (0.359)	0.047 (0.392)
Fixed firm effects	Yes	Yes	No	No
Model P-value	0.001	<0.001	<0.001	<0.001
Number of observations	6335	4170	5864	3854

The table reports regression estimates of the impact of SOX on director pay for the IRRC firms from 1998 to 2004. To be included in the test, the IRRC firm needs to have the necessary IRRC, EXECUCOMP, CRSP, COMPUSTAT, and Disclosure data. *Total pay* is the sum of director cash pay, option pay, and stock pay. Cash pay equals annual cash retainer plus meeting fees times the number of board meetings. Option pay equals the number of options granted times the option value. We use the Black and Scholes (1973) method to compute the option value, assuming that options are granted at the money with a seven-year maturity and the grant price is the closing stock price at the previous fiscal year-end. Stock pay equals the number of shares granted times the closing stock price at the previous fiscal year-end. *Option/total pay* is option pay over total pay. *ROA* is the annual industry-adjusted earnings before interest and taxes scaled by total assets. *ROA* is adjusted for industry performance by subtracting from it the median *ROA* of all the firms in the same four-digit SIC Code as the firm. *Stock return* is the monthly compounded annual stock return adjusted for value-weighted market return. *R&D* is the R&D expenditure over total assets. *R&D* is assumed to be zero if reported missing. *Firm risk* is the annualized standard deviation of the monthly stock return. *Firm size* is the market value of equity. *POSTSOX* is a dummy that takes the value of one if the sample years are after 2001 or zero otherwise. *Zero dividend dummy* is an indicator variable that takes the value of one if a firm does not pay any dividend, zero otherwise. *Tax loss carry-forward dummy* is an indicator that takes the value of one if a firm has a net operating loss carry-forward on its balance sheet. Δ *Workload* is the difference between this year's board meeting frequency and the previous year's. We use panel data techniques and the method of restricted maximum likelihood to estimate models (1), (3), and (4). We estimate model (2) using Tobit given that option awards are censored at zero. *P*-values are reported in parentheses. *, **, and *** indicate the significance at the 10%, 5%, and 1% levels, respectively.

the predicted sign in any specification where we exclude firm fixed effects. The coefficient on the *zero-dividend dummy* is positive and significant, consistent with the notion that firms use more equity pay when they are cash constrained (Yermack 2004; Bryan and Klein 2004). The *tax loss carry-forward dummy* is indistinguishable from zero, which is inconsistent with Yermack's (2004) taxation argument that option pay provides tax advantages. Yermack also found this relation to be empirically insignificant.

Since we are most interested in how pay changed around SOX, models (3) and (4) estimate models where we regress the change in pay and the change in option pay, respectively, on various attributes interacted with our *POSTSOX dummy* and the control variables described above. Since we estimate this in changes, not levels, we do not include firm fixed effects. The interaction between the *POSTSOX dummy* and *Firm size* is negatively related to both the change in total pay and the change in the proportion of pay provided by options, suggesting that directors at small firms experienced a greater increase in both total pay and the option proportion of total pay post-SOX relative to larger firms. We find no significant relation for post-SOX interacted with R&D expenditures. We also include an interaction term for the change in directors' workload (defined as the meeting frequency of the board). While the change in workload is significant (and positive), its interaction with the *POSTSOX dummy* is insignificant. This suggests that while increasing workload is associated with higher pay, that relation is unchanged by SOX. Thus, SOX impacts pay by increasing workload; however, the amount they get paid per unit of work is not significantly altered by SOX.¹⁸ Workload is negatively related to the change in option pay, consistent with the observation that meeting fees are usually paid in cash.

We also interact the *POSTSOX dummy* with stock returns and firm risk. As expected, we find the interaction for stock returns positively and significantly correlated with total pay and incentive pay. This suggests that post-SOX director pay is more sensitive to firm performance, which is not surprising given that directors receive more incentive pay post-SOX. The interaction for firm risk is indistinguishable from zero in both models.

Overall, our results are consistent with the hypothesis that SOX significantly increased director pay and the impact was larger for small firms. Fama and Jensen (1983) argue that outside directors use their directorships to signal to the market that they are expert decision makers and monitors. They further state that "the signals are credible when the direct payments to outside directors are small" (p. 315). However, we find that, due to the dramatic increase in directors' workload and risk, director pay has significantly increased post-SOX. In addition, according to the contracting theory, large firms are more

¹⁸ We also remind the reader that we proxy for workload by the total number of board meetings since we do not have committee-level meeting data for the IRRRC sample. In our random sample (Table 5), we find that committee meeting frequency increases more than does the meeting frequency of the full board. Thus, our proxy may not fully capture the increase in directors' workload, which may reduce the power of this test.

Table 5
Workload of the board and its committees

		Board of directors		Audit committee		Compensation committee		Nominating committee	
		Number of freq	Number of freq	Number of counts	Number of freq	Number of counts	Number of freq	Number of counts	
Small firms (<i>n</i> = 30)	1998	5.8	1.7	30	2.1	27	0.5	4	
	2001	5.8	2.6	30	2.2	27	1.0	5	
	2004	6.9	5.1	30	2.3	30	1.6	22	
Medium firms (<i>n</i> = 30)	1998	5.7	2.3	30	2.1	29	0.2	4	
	2001	6.4	4.0	30	2.4	29	0.9	8	
	2004	7.3	6.2	30	3.3	30	1.9	23	
Large firms (<i>n</i> = 30)	1998	6.5	3.2	30	3.5	29	1.2	22	
	2001	6.4	4.5	30	4.0	30	1.3	25	
	2004	6.4	8.2	30	4.7	30	4.2	30	

The table reports mean values of meeting frequencies (number of freq) for the board and its committees for a sample of randomly selected small, medium, and large firms. For each committee, we also report the number of firms (number of counts) that have each committee. We collect these data from proxy statements. We consider only audit, compensation, and nominating/corporate governance committees (henceforth nominating committee) because they are the most common standing board committees and are the committees specifically referenced by SOX and the new NYSE and NASDAQ listing requirements.

difficult to monitor; thus, they should use more incentive pay. Smith and Watts (1992) also argue that large firms enjoy economics of scale in administrating incentive pay programs and find evidence that firm size is positively related to incentive pay. However, we find that post-SOX, small firms tend to use more incentive pay than large firms to pay their directors. Therefore, our findings are indicative that SOX not only increases director pay but also potentially impacts pay structure.

3.3 Board and committee meetings

The preceding section provides some evidence that directors' workload contributes to higher director pay post-SOX. This section provides direct evidence on the extent of such workload increases. We collect data on the board's committees and the number of times each of those committees meets each year for the random sample.¹⁹ We consider only audit, compensation, and nominating/corporate governance committees (henceforth nominating committee for brevity) because they are the most common standing board committees and are the committees specifically referenced by SOX and the NYSE and NASDAQ listing requirements. Table 5 reports the results. While there is no material change in the meeting frequency for the full board of directors and the compensation committee, the meeting frequency of audit and nominating committees increased significantly. Further, nearly 80% of small and medium firms do not

¹⁹ IRRC does not provide information on the meeting frequency of the board or its committees. ExecuComp provides meeting frequency for the board but not for its committees. In unreported analysis, we compiled meeting frequencies for all firms in ExecuComp (S&P 1500 firms). Consistent with the results based on the random sample, we did not discern any trend in board meeting frequency for ExecuComp firms—the median is six from 1996 to 1998, seven from 1999 to 2000, six from 2001 to 2002, and seven in 2003.

have a nominating committee before SOX. (In the absence of a nominating committee, the full board or the executive committee, which is generally led by the CEO, performs the corresponding function.) However, post-SOX, more than 70% of small and medium firms had a nominating committee. Given that the average board size of those firms is six, these results suggest that it may be more difficult for smaller firms compared to larger firms (which average about ten directors) to have three separate board committees, each of which needs to be entirely independent under the new listing standards.²⁰ Indeed, Michael S. Emen, Senior Vice President, NASDAQ Listing Qualifications, makes this point in explaining the greater flexibility in NASDAQ's rules: "Our new rules take into account the differences in size among issuers by allowing companies to satisfy this (independence) requirement either by having an independent compensation or nomination committee or by allowing the independent directors (of the full board) approve these matters" ("Corporate Governance: The View from NASDAQ," 22 March 2004).

3.4 Directorships and memberships

In this section, we provide additional evidence on directors' workload by studying outside directorships and the proportion of independent directors who sit on all three key committees (audit, compensation, and nominating). The former measures the general market demand for a director, while the latter gauges the workload of independent directors within a firm. If the director market tightens post-SOX, independent directors should sit on more committees within a firm post-SOX. We expect directors, in general, to hold fewer outside directorships, particularly for audit-committee members given the greater responsibilities imposed on them.

Panel A of Table 6 reports the percentage of independent directors who sit on all three committees, and the number of outside directorships and the proportion of busy directors for audit- and non-audit-committee members for the IRRC sample. We define a busy director as one who holds two or more outside directorships if not retired or who holds five or more outside directorships if retired (Ferris, Jagannathan, and Pritchard 2003; Fich and Shivdasani 2006). We define a director as retired if the individual is classified as retired by IRRC or if the individual is more than seventy years old. Consistent with our conjecture, significantly more independent directors sit on all three board committees post-SOX. The results are not consistent with our hypothesis that directors will hold fewer directorships post-SOX. Indeed, the results suggest

²⁰ For operating efficiency, committee meetings often convene about the same time as the full board meetings (usually a day earlier). Firms generally strive to have different directors sit on different committees partially due to governance motivations and partially due to logistic concerns. If an outsider sits on too many committees, it becomes difficult to schedule meetings. As we show later, less than 10% independent directors sit on all committees. As more firms set up separate committees post-SOX, which are required to be entirely independent under the new listing requirements, firms may find it a logistical necessity to add independent directors to staff those committees, leading to larger boards post-SOX. We thank Professor Denny Beresford, former FASB chairman (1987–1997), who now has extensive board experience, typically as chairman of the audit committee, for sharing this insight with us.

Table 6
Directorships and committee memberships

Panel A: Outside directorships and % independent directors who sit on all committees (the IRRC sample)							
	% Independent directors who sit on all committees	Number of directorships among			% Busy directors among		
		Audit members	Nonaudit members	Difference	Audit members	Nonaudit members	Difference
1998	1.490	0.504	0.426	0.078	0.106	0.097	0.010
1999	1.740	0.562	0.477	0.085	0.129	0.108	0.021
2000	2.039	0.533	0.448	0.085	0.119	0.097	0.021
2001	2.144	0.540	0.441	0.099	0.120	0.098	0.022
2002	2.980	0.544	0.450	0.095	0.123	0.099	0.024
2003	6.923	0.543	0.440	0.103	0.120	0.093	0.026
2004	8.908	0.575	0.460	0.115	0.123	0.096	0.027
2005	9.031	0.580	0.452	0.127	0.094	0.081	0.013
Change _{1998–2001}	0.65 5***	0.036***	0.015***		0.014**	0.001	
Change _{2001–2004}	6.7 64***	0.03 5***	0.019***		0.003	–0.001	

Panel B: Outside directorships and other characteristics of directors (the random sample)						
		% Independent directors who sit on all committees	Number of directorships per director	% Busy directors	% Fin expert	Number of directorships per fin expert
Small firms (<i>n</i> = 30)	1998	0.01	1.03	0.21	2.59%	1.00
	2001	6.74	0.65	0.15	5.13%	1.00
	2004	33.02	0.68	0.14	10.00%	1.18
Medium firms (<i>n</i> = 30)	1998	6.38	0.99	0.19	3.91%	1.00
	2001	1.77	1.17	0.25	4.64%	1.17
	2004	15.33	0.96	0.21	6.55%	1.10
Large firms (<i>n</i> = 30)	1998	1.20	1.79	0.39	0.49%	2.00
	2001	3.09	1.95	0.39	1.76%	1.00
	2004	8.74	1.57	0.22	6.36%	1.15

Panel A reports outside directorships held by each director and % independent directors who sit on all audit, compensation, and nominating committees for the IRRC sample. Number of directorships is the average number of outside directorships per director. % Busy directors measures the fraction of directors who held two or more outside directorships if not retired, or five or more outside directorships if retired. Panel B reports outside directorships and other director characteristics for the random sample. % Fin expert is the percentage of directors who are CFOs or professional accountants at the end of the classification year. Therefore, if a director was a CFO the previous year, but became a CEO during the classification year, the individual will not be classified as a financial expert. *** indicate the significance of Wilcoxon two-tailed tests at the 5% and 1% levels, respectively.

that audit-committee members increase their directorships post-SOX, although the proportion of busy directors held relatively flat after SOX. Further, the gap between their directorships and the directorships held by non-audit-committee members widened post-SOX. The results do not support our hypothesis that the general director population held fewer directorships post-SOX, but are consistent with the notion that certain types of directors, those with financial expertise, are in greater demand post-SOX. Further, given that the number of busy directors did not increase, the results are consistent with the conjecture that nonbusy directors with financial expertise added directorships post-SOX.

We also examine these measures for the random sample since the labor market for directors may differ for small and large firms. The results are reported in panel B of Table 6.²¹ Substantially more independent directors sit on all three committees in smaller firms than in larger firms. Directors at smaller firms also held fewer board seats than those at larger firms, supporting the general perception that the latter are more skilled directors and, hence, in greater demand. Directors at medium and large firms increased their directorships from 1998 to 2001, but decreased them from 2001 to 2004. In contrast, directors at small firms exhibit the opposite trend, providing additional evidence that small firms potentially face a different director labor market than large firms. Although firms of all size groups have fewer busy directors post-SOX, large firms exhibit the biggest drop in the proportion of busy directors, 43% decrease post-SOX, compared to 13% for medium firms and 10% for small firms. This is consistent with the notion that directors at larger firms, due to greater visibility, draw greater scrutiny for being too busy.

In view of SOX's specific requirements on directors with a financial background, we also study outside directorships per financial expert.²² We define a director as a financial expert if the individual is an incumbent CFO or professional accountant. Hence, if a director was a CFO the previous year, but became a CEO the current year, the individual will not be classified as a financial expert. (This is a rather stringent requirement, but ensures more consistent classification.) We first examine the proportion of a firm's directors who are financial experts. Consistent with our expectation, firms from all size groups increase the proportion of financial experts on their board post-SOX. The trend

²¹ The number of outside directorships we compile is larger than those reported by IRRC. We cross-checked several firms and find that the difference arises because IRRC misses some directorships. We spoke with the IRRC, which suggested that IRRC only counts directorships at major public corporations, which are essentially the companies covered in the IRRC database. For example, for Jeffrey H. Brotman, director of Starbucks Corporation, the 1998 proxy statement reports his job description as "(JEFFREY H. BROTMAN, 55, has been a director of the Company since March 1989... Mr. Brotman, presently the chairman of Costco Companies, Inc... He is a member of the Board of Directors of Seafirst Bank; The Sweet Factory, a candy retailer; and Garden Botanika, Inc., a cosmetics and skin care retailer)." We count the number of outside directorships for him as three while IRRC only one.

²² Congress left the definition of "financial expert" to the SEC, which defines a financial expert as someone who has, through education and experience, an understanding of financial statements, generally accepted accounting principles, internal controls and procedures for financial reporting, and audit-committee functions.

actually started pre-SOX, but accelerated considerably post-SOX. Further, the increase is the largest for small firms (from 5.13% of the total directors in 2001 to 10.00% in 2004), followed closely by large firms (1.76% to 6.36%). In terms of the number of directorships held, the trends are not particularly strong, although it appears that directors with a financial background at small firms increased their outside directorships post-SOX. Taken as a whole, our findings suggest that small firms may face a tighter director labor market post-SOX than large firms.

3.5 Director and officer (D&O) insurance

SOX not only intends to increase the responsibility of corporate officers and directors but also aims to strengthen the enforcement of federal securities laws. As such, we expect a corresponding increase in the risk that directors face, possibly leading to higher D&O insurance premiums. Unfortunately, we do not have detailed information on D&O insurance data for all firms (it is not a required disclosure). However, we were able to gather some D&O insurance data from several sources. We report aggregate D&O insurance premium results from Towers Perrin Tillinghast's "Tillinghast 2004 Directors and Officers Liability Survey (D&O Liability Survey)." We also collect D&O insurance premium data for firms incorporated in New York since they are a required disclosure in that state. Lastly, we searched the 1998, 2001, and 2004 proxy and financial statements for all S&P 500 firms, and found twelve firms that disclosed some information on D&O insurance premiums.

The D&O Liability Survey includes a historical D&O insurance premium index, which summarizes average D&O insurance premiums back to 1974. In 1998, this index average stood at 539. It increased to 720 in 2001 and to 1113 in 2004. The increase from 1998 to 2001 represents a 34% increase, while the increase from 2001 to 2004 represents a 55% increase. The index showed particularly large increases from 2001 to 2002 (29%) and from 2002 to 2003 (33%).

We report the results for our hand-collected data from New York firms and S&P 500 firms in Table 7. These samples include twenty-seven New York firms that reported D&O insurance premiums in 1998, 2001, and 2004, and twelve S&P 500 firms that reported D&O insurance premiums in those same years. For the twenty-seven New York firms, median D&O insurance premiums rose from \$113,000 in 1998 to \$143,000 in 2001 to \$360,000 in 2004, an increase of 27% from 1998 to 2001 and 152% from 2001 to 2004. For the S&P 500 firms, the median D&O insurance premium increased from \$675,000 in 1998 to \$826,000 in 2001 to \$3.0 million in 2004. This represents an increase of about 22% from 1998 to 2001 and more than 264% from 2001 to 2004. Indeed, all twelve firms reported higher D&O insurance premiums in 2004 compared to 2001. Overall, we find that D&O insurance premiums increased quite dramatically in the post-SOX period, supporting the notion that director risk increased post-SOX. An important caveat with respect to our D&O insurance results is

Table 7
D&O insurance premiums from 1998 to 2004

	N	MVE (\$millions)	D&O insurance premiums			% Change	
			1998	2001	2004	1998–2001	2001–2004
Panel A: D&O insurance premiums for firms incorporated in New York							
Mean	27	\$16,175	\$355,310	\$427,692	\$2,047,142	20.4%	378.6%
Median	27	\$436	\$112,645	\$142,800	\$360,000	26.8%	152.1%
Panel B: D&O insurance premiums for S&P 500 firms							
Mean	12	\$26,318	\$875,860	\$1,042,674	\$4,951,388	19.0%	374.9%
Median	12	\$6,210	\$674,977	\$825,741	\$3,008,587	22.3%	264.3%

Disclosure of D&O insurance in the United States is required only for companies incorporated in New York, and is voluntary for all others. We searched proxy and financial statements for New York firms as well as all S&P 500 firms for 1998, 2001, and 2004. Panel A reports mean and median D&O insurance premiums for all New York firms that disclosed data for all three years and panel B reports the same for all S&P 500 firms that disclosed data for all three years.

that we know very little about the details of the associated D&O policies. If the type of coverage (limits, deductibles, types of exclusions, etc.) systematically changed post-SOX, then we do not have direct apples-to-apples comparisons. We conjecture that the limitations and restrictions likely increased, if anything, post-SOX. If that is the case, then the total cost of the D&O insurance risk may have increased even further than what the increased premiums imply. However, it could also be that firms increased their D&O coverage in the wake of SOX, which would bias our estimates upward.

4. The Impact of SOX on Board’s Structure

In this section, we examine how SOX affected board’s structure. For most of this analysis we use the Disclosure sample as well as the IRRC sample. Some of this analysis is similar to Linck, Netter, and Yang (2008), who examine the factors that determine board’s structure. However, here we focus on the regulatory impact of SOX on board’s structure, which is one element in understanding how SOX affected the supply and demand of directors.

4.1 Board development from 1989 to 2005

Figure 2 shows the development of the board from 1989 to 2005 for the Disclosure sample, the IRRC sample, and Disclosure firms with market capitalization under \$75 million. We add the third category because we are interested in understanding the impact of SOX on small firms. We describe board composition as the fraction of nonemployee directors on the board. We use the two-way classification scheme of employee (insiders) and nonemployee directors (outsiders) because the Disclosure database lacks sufficient information for

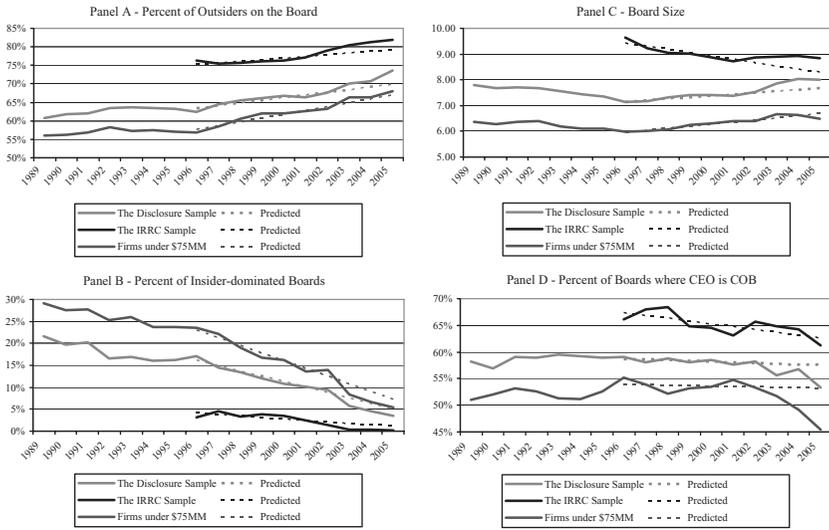


Figure 2
Board development pre- and post-SOX

The figure reports the development of board’s structure from 1989 through 2005 for the Disclosure sample, the IRRC sample, and Disclosure firms with market capitalization under \$75 million. Panel A reports the percentage of outsiders, nonemployee directors, on the board. Panel B reports the percentage of firms that have a majority of insiders on the board. Insiders are defined as employee directors for both Disclosure and IRRC firms. Panel C reports average board size and Panel D reports the percentage of firms that have combined the CEO and COB titles. The dotted lines represent the predicted values of each corresponding board attributes based on the past mean values from 1996 to 2001.

us to identify inside, gray, and independent directors.²³ In addition to the actual values of each attribute, we report the “predicted” values based on a simple time-series extrapolation to better highlight whether post-SOX changes were different from trends already occurring. Panel A shows that the mean proportion of outsiders on the board increased steadily throughout the sample period. This finding is consistent with the general perception that corporate boards are becoming more independent due to increased shareholder activism and public pressure. Additionally, it appears that SOX intensified this trend. For example, the mean ratio of outsiders on the board for the Disclosure sample increased by 5.6 percentage points over the twelve years from 1989 to 2001 (60.7% to 66.3%), compared to a 7.3 percentage point increase in just four years from 2001 to 2004.

Panel B of Figure 2 shows the time trend in board composition measured as a percentage of firms with insider-dominated boards. We consider a board as insider dominated if insiders comprise more than 50% of the board. Consistent with the results in panel A, the percentage of firms with insider-dominated

²³ This officer/director classification is also used in other studies, including Borokhovich, Parrino, and Trapani (1996); Agrawal and Knoeber (2001); Kroszner and Strahan (2001); and Lehn, Patro, and Zhao (Forthcoming). *Million Dollar Directory* also uses this classification.

boards decreased monotonically from 21.6% in 1989 to only 3.5% in 2005 for the Disclosure sample—the decline was steepest during the post-SOX period. We observe a similar trend for the IRRC sample. There were almost no IRRC firms with a majority of insiders on the board during the post-SOX period. Small firms exhibited the biggest decrease in insider-dominated boards. The ratio declined from 29.2% in 1989 to 13.5% in 2001 and then to 5.3% in 2005.

Panel C of Figure 2 shows the time trend of board size from 1989 to 2005. The management literature (e.g., Kephart 1950; Feldman and Arnold 1983) finds that communication and coordination problems reduce the effectiveness of large groups. Using similar arguments, Lipton and Lorsch (1992) and Jensen (1993) suggest that smaller boards are more efficient than larger boards. Consequently, there has been public pressure on firms to reduce their board size. For the Disclosure sample, the mean board size decreased by 5.6% from 1989 to 2001 (Wilcoxon P -value = 0.01). The IRRC sample, which covers larger, more visible firms, showed an even larger decrease of 9% from 1996 to 2001 (Wilcoxon P -value = 0.01). Interestingly, post-SOX average board size increased for both samples. From 2001 to 2005, average board size of the Disclosure firms increased by 8.4%, reversing the entire reduction in board size over the previous twelve years (Wilcoxon P -value = 0.01). While the average board size for the IRRC firms also increased, it is not economically or statistically significant. The board size of small firms decreased slightly from 1989 to 1997 and then started to increase thereafter. It reached its peak in 2003, and then slightly decreased afterward, consistent with the notion that smaller firms have more difficulty recruiting directors post-SOX.

Panel D of Figure 2 shows the trend in the proportion of firms that have the CEO chair the board from 1989 to 2005. Despite the public call for separating the two posts of CEO and COB (see, for example, Lipton and Lorsch 1992; “Changes Across the Board,” *The McKinsey Quarterly*, 2002, among others), the percentage of Disclosure firms with combined titles of CEO and COB stayed relatively constant from 1989 to 2001. Interestingly, despite the fact that SOX has no provisions regarding board leadership, the proportion of firms that combined the two titles dropped in the post-SOX period. Small firms showed the steepest decrease, from 54.8% in 2001 to 45.5% in 2005 (Wilcoxon P -value < 0.01).

In summary, these descriptive results are consistent with the view that SOX had a significant effect on board’s structure, and that its effect varies with firm size.

4.2 The impact of SOX on board’s structure

Although the previous descriptive results suggest that SOX had a significant effect on board’s structure, one concern is that the results are driven by firms entering or exiting the sample. To alleviate this concern and to further investigate the impact of SOX, we perform multivariate tests on the firms that survived from 1998 to 2004. We choose the 1998–2004 period so that we can have

roughly equal time intervals for board changes pre- and post-SOX. However, this does create a survivor-bias problem. Although the literature has so far produced mixed evidence on the causality between board's structure and firm performance (see, for example, Bhagat and Black 2002), the current reforms are presumably premised on the belief that SOX will improve governance, which will result in better performance and long-term survival. Requiring sample firms to survive from 1998 to 2004, a period that spans an economic recession, may bias the sample to better-performing firms. If it is true that better-governed firms perform better, then SOX will have less effect on these firms, resulting in a downward bias in our estimation of the impact of SOX for this sample.

We estimate the following models to analyze the impact of SOX on board's structure, controlling for firm-specific factors that the literature has shown to influence board's structure (e.g., Lehn, Patro, and Zhao Forthcoming; Boone et al. 2007; Linck, Netter, and Yang 2008).

$$\begin{aligned} BoardSize = & \alpha + \beta_1 POSTSOX + \beta_2 COMPLEX + \beta_3 MONCOSTS \\ & + \beta_4 LogMVE + \beta_5 CEO_Own + \beta_6 Director_Own + \varepsilon, \end{aligned} \quad (3)$$

$$\begin{aligned} BoardIndep = & \alpha + \beta_1 POSTSOX + \beta_2 COMPLEX + \beta_3 MONCOSTS \\ & + \beta_4 LogMVE + \beta_5 CEO_Own + \beta_6 Director_Own \\ & + \beta_7 FCF + \beta_8 Performance + \beta_9 Log(CEO_Age) \\ & + \beta_{10} Lag(CEO_Chair) + \varepsilon. \end{aligned} \quad (4)$$

POSTSOX is a dummy variable that takes the value of one if the sample period falls after 2001. Based on our earlier analysis, we expect it to correlate positively with board size (*BoardSize*) and board's independence (*BoardIndep*). Linck, Netter, and Yang (2008) argue that large firms or firms with complex operating and financial structures benefit more from outside advising and monitoring. Consistent with their hypothesis, they find those types of firms have larger and more independent boards. Following Linck, Netter, and Yang (2008), we use principal component analysis and extract one factor from log of firm age, total debt over total assets, and log of business segment to proxy for firms' operation and financial complexity (*COMPLEX*). Linck, Netter, and Yang (2008) also argue that outsiders lack firm-specific information and, hence, face information acquisition and processing costs. Larger boards also face additional costs of free-rider, coordination, and/or communication problems (Lipton and Lorsch 1992; Jensen 1993). Therefore, they predict that board size and board's independence decrease in monitoring costs. They use standard proxies for information asymmetry (stock return volatility) and growth opportunities (market-to-book

ratio and R&D expenditure) to measure firms' monitoring costs. Following Linck, Netter, and Yang (2008), we extract one factor from the market-to-book ratio, R&D expenditure, and stock return volatility to capture firms' monitoring costs (*MONCOSTS*). Boone et al. (2007) and Linck, Netter, and Yang (2008) find that proxies for CEO power (firm performance and CEO age) and CEO incentive alignment (CEO ownership) correlate negatively with board's independence. Linck, Netter, and Yang (2008) show that outside director ownership is positively associated with larger and more independent boards. They also find that firms with a high level of free cash flow and firms where the CEO is also the chair have more independent boards. Therefore, we also control for CEO ownership (*CEO_Own*), outside director ownership (*Director_Own*), log of CEO age (*Log(CEO_Age)*), firm performance (*Performance*; return on assets after adjusting for industry median), free cash flow (*FCF*; the measure in Lehn and Poulsen 1989), a lagged dummy indicating whether the CEO is the chair (*Lag(CEO_Chair)*) in the regressions for board size and board's independence accordingly.

One of the main objectives of SOX is to strengthen board monitoring by mandating more independent boards. Therefore, by design, SOX is more likely to increase the board's independence of those firms that are not in compliance with the new rules before the enactment of SOX. However, it is unclear whether they do so by adding independent directors or removing nonindependent directors. We believe that this research question is interesting because it helps us assess director supply post-SOX and whether firms desire a certain number of insiders on the board. Due to data limitations, we define noncompliant firms in the Disclosure sample as those with a majority of employee directors on the board. We also expect SOX to have a greater impact on small firms and firms with a larger CEO ownership stake, since those firms tend to have more insiders on the board (Linck, Netter, and Yang 2008) and hence are more likely to be affected by the Act.

To test the above hypotheses, we interact *POSTSOX* with our measure of a firm's compliance (*Non-compliant*), firm size (*LogMVE*), and CEO ownership (*CEO_Own*). We hypothesize *Non-compliant*POSTSOX* and *CEO_Own*POSTSOX* to be positively related to board's independence, and *LogMVE*POSTSOX* to be negatively related to board's independence. For reasons stated earlier, we treat the relations between these three interaction terms and board size as an empirical question. Table 8 presents the results. Models (1) and (4) report the results from estimating Equations 3 and 4 above. Consistent with our expectation, *POSTSOX* is positively and significantly related to board size and board's independence. Our results on the control variables are largely consistent with the existing literature. For example, we find that complex firms have larger and more independent boards.

Models (2) and (5) in Table 8 add a dummy for noncompliant firms as well as interacted terms to estimate the extent to which these relations changed post-SOX. As expected, noncompliant firms had smaller and less independent

Table 8
The effect of SOX on board's structure

Independent variables	Board size			board's independence				
	(1)	(2)	(3)	(4)	(5)	(6)		
<i>POSTSOX</i>	+	0.157*** (0.000)	0.063 (0.436)	-0.018 (0.937)	+	0.014*** (0.000)	-0.006 (0.383)	-0.051*** (0.011)
<i>POSTSOX*SOXeffect</i>								0.081 (0.698)
<i>Non-compliant</i>		-0.222*** (0.001)	-0.222*** (0.001)	-		-0.111*** (0.000)	-0.111*** (0.000)	-0.111*** (0.000)
<i>Non-compliant*POST SOX</i>		0.225** (0.025)	0.225** (0.026)	+		0.065*** (0.000)	0.065*** (0.000)	0.065*** (0.000)
<i>LogMVE*POST SOX</i>		0.010 (0.413)	0.010 (0.413)	-		0.002* (0.093)	0.002* (0.095)	0.002* (0.095)
<i>CEO_Own*POST SOX</i>		0.291 (0.316)	0.328 (0.283)	+		0.050* (0.055)	0.068*** (0.011)	0.068*** (0.011)
<i>COMPLEX</i>	+	0.303*** (0.000)	0.300*** (0.000)	0.300*** (0.000)	+	0.012*** (0.000)	0.011*** (0.000)	0.011*** (0.000)
<i>MONCOSTS</i>	-	-0.101*** (0.000)	-0.101*** (0.000)	-0.101*** (0.000)	-	-0.002 (0.409)	-0.002 (0.410)	-0.002 (0.422)
<i>LogMVE</i>	+	0.407*** (0.000)	0.401*** (0.000)	0.401*** (0.000)	+	0.013*** (0.000)	0.012*** (0.000)	0.012*** (0.000)
<i>CEO_Own</i>	-	-2.047*** (0.000)	-2.086*** (0.000)	-2.098*** (0.000)	-	-0.154*** (0.000)	-0.150*** (0.000)	-0.156*** (0.000)
<i>Director_Own</i>	+	0.398 (0.343)	0.332 (0.430)	0.331 (0.431)	+	0.098*** (0.005)	0.071** (0.040)	0.070** (0.040)
<i>FCF</i>				+	-0.011 (0.243)	-0.010 (0.314)	-0.011 (0.245)	-0.011 (0.245)
<i>Performance</i>				-	0.002 (0.828)	0.002 (0.821)	0.002 (0.830)	0.002 (0.830)
<i>Log(CEO_Age)</i>				-	0.005 (0.654)	0.001 (0.917)	0.001 (0.913)	0.001 (0.913)
<i>Lag(CEO_Chair)</i>				+	0.023*** (0.000)	0.024*** (0.000)	0.024*** (0.000)	0.024*** (0.000)
<i>Controlled</i>		-0.032 (0.800)	-0.031 (0.806)	-0.007 (0.961)	-	-0.016 (0.132)	-0.017 (0.120)	-0.003 (0.837)
Number of observations		11,669	11,669	11,669		10,049	10,049	10,049
Model <i>P</i> -value		< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001

The table reports estimation results of panel-data analysis of the differential effects of SOX on board's structure. For this analysis, we use Disclosure firms that survived from 1998 to 2004. Board size is the number of directors on the board. board's independence is the percentage of nonemployee directors on the board. *POSTSOX* is a dummy that equals one if the sample years are after 2001 or zero otherwise. *Non-compliant* is a dummy variable that equals one if the majority of the directors on the board are employee directors the prior year or zero otherwise. *SOXeffect* is a dummy variable that equals one if the firm is *not* a controlled firm. *Controlled* is a dummy indicating whether it is a controlled firm (firms with more than 50% of the voting power held by an individual, a group, or another company). Controlled firms are not required to comply with SOX. All models include intercepts and control for industry fixed effects and firm-level random effects. The table reports the sign predicted by our hypotheses, the coefficient estimates, and the *P*-values. *, **, and *** indicate the significance at the 10%, 5%, and 1% levels, respectively.

boards. In this specification, *Non-compliant*POSTSOX* is positively related to both board size and independence and the *POSTSOX dummy* (not interacted) is insignificant. This suggests that the observed increase in board size and independence is driven by firms that were previously not in compliance with SOX, which also supports the contention that there is a distinct SOX effect as opposed to just an extrapolation of already existing trends. The results also suggest that noncompliant firms may have become more independent by

adding outsiders rather than reducing insiders. $LogMVE*POSTSOX$ is positive and marginally significant in the board's independence regression, suggesting that large firms add more outsiders to the board than small firms. Although this finding is contrary to our prediction, it supports the argument that large firms face more complex board tasks and hence potentially need to hire more directors. It is also consistent with the view that large firms are better able to recruit outside directors. $CEO_Own*POSTSOX$ is insignificant in the board size regression, but is significantly positively related to board's independence, consistent with our prediction.

Other significant events were also taking place in the economy around SOX, including several major corporate scandals, a recession, elevated shareholder activism, etc. Together these forces changed the corporate governance landscape, including board's structure. This makes it difficult to disentangle how much of the changes we observe are due to SOX, and how much are due to other forces occurring contemporaneously. To further address this issue, we utilize a specific SOX exemption. SOX applies to all firms listed in the United States except for controlled firms, firms in bankruptcy, passive business organizations, and foreign issuers.²⁴ While the Disclosure sample does not include most of these exempted companies, it does include controlled firms. Controlled companies are those "with more than 50% of the voting power held by an individual, a group, or another company." The full Disclosure sample includes 927 controlled firms, 291 of which survived from 1998 to 2004. Thus, to better tease out the specific impact of SOX we use the following model:

$$Board\ structure = \beta X + \delta POSTSOX + \gamma POSTSOX * SOXeffect, \quad (5)$$

where X is a vector of the variables that determine board's structure. $POSTSOX$ is the dummy variable that equals one if the sample period falls after 2001, and $SOXeffect$ is a dummy variable that equals one if the firm is *not* a controlled firm. In this model specification, δ captures the impact of all the events that happened after 2001, which include SOX, corporate scandals, stock market decline, etc. In other words, δ captures the collective forces that changed board's structure post-SOX. On the other hand, $SOXeffect$ shifts the intercept only for those firms specifically targeted by SOX. Therefore, γ measures the impact of SOX on boards above and beyond what would have happened without SOX. Models (3) and (6) in Table 8 report the results. $POSTSOX*SOXeffect$ is positive and significant in the board's independence regression, suggesting that SOX has a significant impact even after we control for other forces influencing boards at that time. Interestingly, $POSTSOX*SOXeffect$ is insignificant in the board size regression. Note that SOX does not have any direct mandate regarding board size.²⁵

²⁴ For details about the exemptions, please refer to <http://www.sec.gov/rules/sro/34-48745.htm>.

²⁵ Following Linck, Netter, and Yang's (2008) specification, we also estimate the impact of SOX on the probability of CEO being the COB by including SOX dummy ($POSTSOX$), the corresponding interacted terms,

Overall, our multivariate results confirm our earlier descriptive and univariate findings. Post-SOX boards are larger and more independent, and are more likely to separate the CEO and COB posts. These effects vary with firm characteristics. SOX had a bigger impact on firms with less independent boards, smaller firms, and firms with high CEO ownership. Further, SOX had a bigger impact on firms specifically targeted by the Act, suggesting a distinct SOX impact beyond trends that were already occurring.

5. The Impact of SOX on the Director Pool

In this section, we examine how SOX impacted the composition of the director pool. We first examine the overall frequency of directors' turnover pre- and post-SOX and then analyze the types of directors that make up the director pool in the pre- and post-SOX periods. Since we are interested in the identity of directors, we use the IRRC sample for this analysis.

5.1 Directors' turnover from 1996 to 2004

Figure 3 illustrates directors' turnover for the IRRC sample from 1996 to 2005. To maintain data consistency, we exclude new firms and delisted firms. More than 60% of firms experienced directors' turnover in any given year. Denis and Sarin (1999) find that 40% of the firm-years in their sample period (1983–1992) exhibit directors' turnover, suggesting a higher turnover in more recent periods. This is consistent with the results for CEO turnover. Kaplan and Minton (2006) report that CEO turnover is higher from 1998 to 2005 than from 1992 to 1997. Further, directors' turnover is particularly high in 2003 and 2004, the two years following SOX. In addition to SOX, the higher directors' turnover is consistent with anecdotal evidence that board reforms such as term limits and performance evaluation led to more scrutiny of the board (“Directors Who Don't Perform Will Be Asked to Resign,” *PR Newswire*, 13 August 1999; “When Deadwood Doesn't Refer to the Table,” *The New York Times*, 17 October 1999; “Corporate Boardrooms May See as Much as 50% Turnover,” *Dow Jones News Service*, 13 August 2002).

and finally *POSTSOX*SOXeffect*. Consistent with our descriptive analysis, we find that *POSTSOX* is negatively and significantly related to the likelihood that the CEO is also the COB. Note that SOX has no mandates with respect to separating the CEO and COB posts. We do not find significant relations for interacted terms and *POSTSOX*SOXeffect*. We have also done other robustness checks. We reestimate the model using robust standard errors clustered at the firm level (Petersen 2008). We also estimate seemingly unrelated regressions (SURE) to control for the potential joint determination of board size and board's independence. We obtain similar results. Further, we estimate the same regressions for the IRRC sample. Given the richer information available for the IRRC sample, we construct a more detailed noncompliance score that captures the extent to which a firm is not in compliance with SOX and the exchanges. Specifically, the noncompliance score is the sum of five dummy variables, each taking the value of one if the board consists of a majority of inside directors, or if the audit, compensation, nominating, or governance committee is not 100% independent. Thus, a noncompliance score of five indicates that the firm needs to make the biggest change in board's structure to meet the requirements of SOX and the exchange-rule changes. The results are similar to those for the Disclosure sample, with some minor differences. The differences may be driven by the fact that, on average, the IRRC firms are much larger than Disclosure firms. We do not report the results from these robustness checks to conserve space.

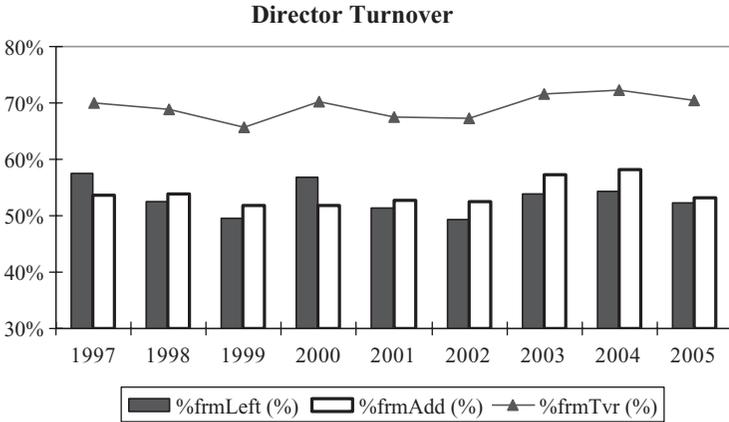


Figure 3
Directors' turnover from 1996 to 2005

This figure illustrates directors' turnover using the IRRC sample from 1996 to 2005. %frmTvr denotes the percentage of firms that either lost or added directors during a given year. %frmLeft denotes the percentage of firms that exhibited director departures in a given year. %frmAdd denotes the percentage of firms that appointed new directors in a given year. We exclude turnover due to delisting or new entrants.

5.2 The impact of SOX on the composition of the director pool

In this section, we investigate whether the composition of the director pool has changed post-SOX. We classify directors into six broad categories based on the information provided by IRRC:

- (1) *Executive*: executives of a nonfinancial service company;
- (2) *Retired*: directors who are retired executives or more than seventy years old;
- (3) *Financial*: private investors or those who work in financial services industries;
- (4) *Lawyer*: lawyers or consultants;
- (5) *Academic*: directors who work for academic institutions; and
- (6) *Other*: all other classifications.

We report the results in Table 9, panel A. Executive directors made up more than half of the director pool prior to 2002. That proportion declined monotonically to 36.84% in 2005, with the steepest decline occurring post-SOX. This trend is consistent with the hypothesis that SOX increased the risk and workload of directors, resulting in fewer sitting executives serving as directors (Bebchuk et al. 2006). Further supporting this conjecture is the increase in directors who are retired. It appears that firms demand the expertise/skill of executives, but that the workload demands are increasingly too great for sitting executives. The proportion of directors with financial expertise and the proportion of lawyers/consultants also increased, likely filling demands for specific expertise driven by the new regulations such as financial expertise and increased

Table 9
The impact of SOX on the composition of the director pool

Panel A: Time trend in director supply, 1998–2005

	Executive	Retired	Financial	Lawyer	Academic	Other
1998	54.71	19.93	5.56	4.88	4.19	10.73
1999	53.91	23.16	7.64	5.27	4.56	5.44
2000	53.34	23.43	8.70	5.41	4.09	5.03
2001	50.80	24.39	10.45	5.55	4.00	4.80
2002	48.19	25.87	11.12	7.75	4.59	2.49
2003	43.24	26.87	12.99	8.73	4.67	3.51
2004	42.17	27.11	12.93	8.91	4.81	4.07
2005	36.84	29.23	12.77	9.69	4.89	6.59
Change _{1998–2001}	−3.91***	4.46***	4.89***	0.67**	−0.19	−5.93***
Change _{2001–2004}	−8.63***	2.72**	2.48***	3.36***	0.81***	−0.73***

Panel B: Directors' turnover by director type, 1999–2005

	Independent directors (%)								
	Employee directors (%)	Gray directors (%)	Audit committee members	Nonaudit committee members					
				Executive	Retired	Financial	Lawyer	Academic	Other
<i>Departures</i>									
1999	23.99	21.61	27.82	7.24	12.93	0.93	0.93	1.34	3.21
2000	26.06	20.76	28.12	8.99	11.23	1.53	1.08	0.90	1.35
2001	23.90	21.07	28.03	8.28	11.10	2.07	1.88	1.60	2.07
2002	24.76	16.35	30.33	8.77	13.15	2.37	1.42	1.30	1.54
2003	19.20	20.50	31.13	9.65	12.26	3.69	2.06	1.08	0.43
2004	18.31	20.07	32.13	8.44	14.14	3.84	1.86	0.88	0.33
2005	17.67	18.46	34.68	6.60	12.98	3.47	2.80	1.90	1.45
Change _{1999–2001}	−0.10	−0.54	0.22	1.04	−1.83	1.14**	0.95*	0.25	−1.14
Change _{2001–2004}	−5.58***	−1.01	4.09**	0.16	3.04**	1.77**	−0.02	−0.72	−1.74***

(continued overleaf)

Table 9
(Continued)

	Employee directors (%)	Gray directors (%)	Audit committee members	Executive	Retired	Financial	Lawyer	Academic	Other
<i>Additions</i>									
1999	22.02	13.87	18.72	26.48	6.79	3.59	2.13	3.49	2.91
2000	23.51	11.91	21.83	26.09	5.56	3.87	2.58	2.08	2.58
2001	20.19	12.30	24.32	23.94	6.29	3.76	3.76	3.57	1.88
2002	17.77	11.50	24.94	22.89	7.97	5.24	3.64	3.99	2.05
2003	10.92	7.35	31.83	21.85	10.29	5.25	5.99	3.57	2.94
2004	12.72	5.58	34.13	21.20	11.89	4.65	3.62	3.41	2.79
2005	13.06	5.73	31.16	18.10	13.98	3.89	6.87	4.01	3.21
Change _{1999–2001}	−1.83	−1.57	5.60***	−2.54	−0.50	0.17	1.62**	−0.08	−1.03
Change _{2001–2004}	−7.47***	−6.72***	9.81***	−2.74	5.60***	0.90	−0.14	−0.16	0.91

This table examines the impact of SOX on the composition of the director pool using the IRRC sample. There are 88,558 directors in the IRRC sample during the period between 1998 and 2005. We classify a director as an executive director if the individual is an executive of a nonfinancial service company, as retired if the individual is noted as such by the IRRC or is more than seventy years old, as a financial director if the individual is a private investor or works in the financial service industry, as a lawyer if the individual is a lawyer or a consultant, or as an academic if the individual works for an academic institution. We group directors with other backgrounds into the “other” category. Panel A reports the time trend in the director pool by director type. Panel B reports directors’ turnover by director type. *, **, and *** indicate the statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed chi-square tests.

risk of litigation. Financial experts and lawyers/consultants represented 21% of the director pool in 2004 compared to 10% in 1998. Interestingly, boards added proportionately more lawyers post-SOX than any other category. The share of directorships held by lawyers rose from 5.55% in 2001 to 8.91% in 2004, consistent with rising legal liabilities.

Given that SOX has a particular focus on the audit committee, we separately examine directors' turnover for audit- and non-audit-committee members. The results are presented in Table 9, panel B. We find a significantly higher turnover on the audit committee (departures and additions) post-SOX compared to pre-SOX. Departures from the audit committee rose from 28.0% in 2001 to 32.1% in 2004, and additions rose from 24.3% to 34.1%. These results are consistent with firms restructuring their audit committees to meet the demands of the new requirements for independence and financial expertise. It may also be the result of the turnover at firms that experience financial scandals. For example, Srinivasan (2005) finds that the likelihood of director departure increases in the severity of a restatement, particularly for audit-committee members. With respect to non-audit-committee members, we find a statistically significant increase in both additions and departures for retired executives post-SOX. Interestingly, the turnover of lawyer directors increased faster pre-SOX than it did post-SOX.

We also analyze the impact of SOX on directors' turnover in a multivariate setting. Since the insights are neither surprising nor new given our previous analysis, we do not tabulate these results to conserve space. Our models include various control variables following Hermalin and Weisbach (1988) and Yermack (2004). Consistent with expectations, firms were more likely to appoint independent directors to the board throughout the sample period, and this likelihood increased post-SOX. Post-SOX firms were also more likely to appoint new audit-committee members. Interestingly, the probability that a firm adds a busy director increased post-SOX, supporting the notion of a tightened supply of qualified directors post-SOX. Consistent with our earlier results, executives are less likely to be appointed to the board post-SOX.

6. Conclusion

The Sarbanes-Oxley Act of 2002 represents the most dramatic change to the securities laws regulating corporate governance since the 1933 and 1934 Acts. SOX was motivated by the scandals that hit corporate America in the early years of the twenty-first century. While the scandals were caused by the actions of corporate executives, many argue that better monitoring by boards and accountants, among others, could have prevented the scandals from occurring. With SOX, the federal government for the first time moved into direct merit regulation (as opposed to disclosure regulation) of the behavior of managers, as well as the structure of corporate boards. SOX and the contemporary changes in the exchange rules require greater documentation of internal

controls, an increase in reporting requirements, and impose specific requirements on corporate boards and greater responsibility on directors.

Our guide for examining the changes in boards and directors is using a simple supply and demand framework. We consider factors that affected the supply of directors (workload and risk) and factors that affected the demand (requirements for more independent directors). We then examine the overall effect on the price (pay) and quantity of directors and the factors that drive those shifts (increased directors' workload and personal liability), as well as other effects including the composition of the director pool, directors' turnover, and board's structure.

We examine these issues using broad-sample evidence from more than 8000 public companies, as well as detailed analysis of other subsamples. The breadth and depth of our sample allow for a comprehensive analysis of board-related costs, and the extent to which the costs of these regulatory mandates are uniform across firms. Broadly speaking, our evidence suggests that SOX and contemporary reforms dramatically increased the cost of corporate boards, particularly for small firms. We find that director compensation increased substantially post-SOX. Further, we find some evidence that SOX imposes a disproportionate burden on small firms. For example, small firms paid \$3.19 in director fees per \$1000 of net sales in 2004, which is \$0.84 more than they paid in 2001 and \$1.21 more than in 1998. In contrast, large firms paid \$0.32 in director fees per \$1000 of net sales in 2004, seven cents more than they paid in 2001 and ten cents more than in 1998. In 2004, director pay per \$1000 of net sales is almost ten times higher for small firms than for large firms. These results illustrate the relatively greater impact of these costs on smaller public firms. In addition, most of the literature critiquing the burdensome costs of SOX has focused on the cost of complying with Section 404. This article shows that SOX affected other expenses of public companies as well, particularly for small firms that have not yet had to comply with Section 404.

We find evidence consistent with the theory that directors' workload and risk increased post-SOX. Board committees meet more often post-SOX, particularly the audit committee, and many firms now pay additional fees to the chair and members of the audit committee post-SOX, a practice that was rare pre-SOX. In addition, we find substantial increases in D&O insurance premiums from 2001 to 2004.

SOX also had a substantial impact on board's structure, directors' turnover, and the director pool. Post-SOX boards are larger and more independent, and more firms separated the two posts of CEO and the COB. The degree of these board changes varied with firms' characteristics. Firms that did not have majority independent boards prior to SOX exhibited greater increases in board's independence and board size. Larger firms were more likely to increase outsider representation on the board than smaller firms post-SOX, and firms with higher managerial ownership were more likely to add directors and separate the CEO and COB titles. Not surprisingly, firms were less likely to add inside directors,

and more likely to add independent directors to the board post-SOX compared to pre-SOX. We also find that the makeup of the director pool changed post-SOX. The proportion of directors that are sitting executives dropped significantly, while the proportion held by retired executives, financial experts, and lawyers/consultants increased. While this trend predated SOX, many of these trends accelerated post-SOX.

We focus on the effects on directors and the board of directors as it is beyond the scope of this article to draw conclusions as to the overall net cost or benefit of SOX. However, our analysis does provide some guidelines for future research. For example, as we noted, the mandates of SOX are aimed at setting up boards and directors to reduce the possibility of undetected fraud and engaging in fraudulent behavior. One obvious outcome of these mandates is, on average, larger boards. However, the literature has suggested that larger boards may be less effective than smaller boards (Yermack 1996; Eisenberg, Sundgren, and Wells 1998). What are the value implications of this change and the effects on performance? Have the mandates of SOX increased directors' workload and changed board's structure so materially that it has affected the advisory role of boards? SOX's mandates all deal with the monitoring function of boards, not the role in advising on business strategy. Finally, we also find that director compensation increased substantially post-SOX. Combined with larger boards this means that firms are paying much more for their board (relatively more for small firms). The directors may be more independent, more numerous, and harder working, but what are the implications of these changes on firm performance? Pay for monitoring has never been a mantra of good governance. How has SOX impacted a firm's ability to deal with changes in the environment and what types of firms are most affected? We raise these important questions for future research.

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