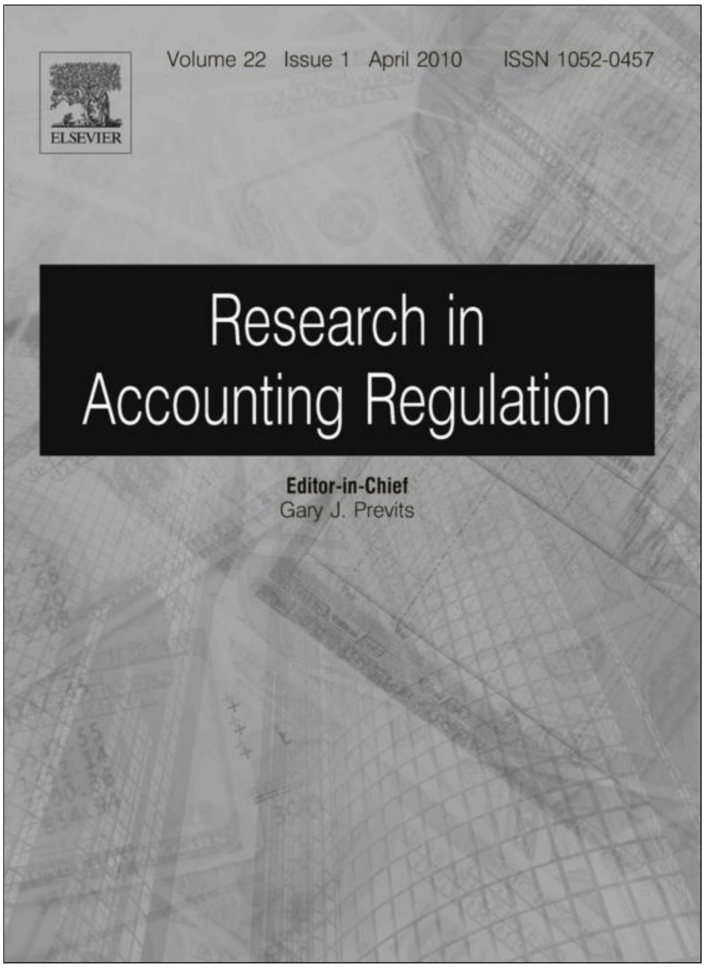
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Regular Paper

The unintended effects of the Sarbanes–Oxley Act of 2002

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ABSTRACT

The auditing profession came under intense scrutiny following the collapse of Enron and several other leading firms. Legislators responded swiftly with the Sarbanes–Oxley Act of 2002, a stringent rules-based system widely considered the most comprehensive economic regulation since the New Deal. Researchers such as DeFond and Francis (2005) and Baker (2008) suggest the law may produce serious unintended harmful consequences, resulting in a call for further research to evaluate its impact upon firms. This paper contributes to this literature in several ways. First, it conducts a review and analysis of multiple literatures to formulate several exploratory hypotheses. Second, the strength of the conceptual model is evaluated using a random sample survey of Fortune 500 CEOs ($n = 206$). This represents the first scholarly attempt to evaluate managerial perception of this important law, which Buckley and Chapman (1997) suggest may be more relevant that its actual costs. Third, drawing from Carmona and Trombetta (2008), we suggest the law's overarching reliance upon strict, inflexible rules may have influenced CEO perception of Sarbanes–Oxley. Since this is not a cost/benefit analysis, neither the potential benefits of the law nor its net effects were evaluated.

Introduction

The importance of auditing is underscored by the intense scrutiny placed upon the profession after the collapse of Enron and reports of accounting fraud at WorldCom, HealthSouth, and other leading firms. In the United States, Congress enacted the Sarbanes–Oxley Act of 2002, widely considered the most comprehensive economic regulation since the New Deal. Past research such as that by DeFond and Francis (2005) has questioned whether the law was necessary.[1] Other studies support concerns that the law can impose harmful consequences upon firms—beyond any direct effect upon auditing (DeFond & Francis, 2005; Baker, 2008). To date, only a few studies have sought to analyze this issue further. Cohen, Dey, and Lys (2007) for instance, find that Sarbanes–Oxley altered the structure of managerial compensation owing to an increase in managerial risk aversion, and reduced research and development spending and capital investments. Litvak (2008) found that the law induced a reduction in corporate risk taking, especially for riskier and better-governed firms. Several studies suggest the law has led firms to replace accrual-based earnings management with real earnings manipulation, with no net improvements in terms of information quality (e.g., Bartov & Cohen, 2008; Cohen, Dey, & Lys, 2008; Graham, Harvey, & Rajgopal, 2005).

Without mentioning Sarbanes–Oxley, Carmona and Trombetta (2008) denote the process by which inflexible, "rules-based" accounting systems impose significant costs upon firms and the accounting profession in general. Rules-based systems are characterized by specific criteria, definitions, thresholds, precedents, examples, and implementation guidance (Nelson, 2003). Sarbanes–Oxley shares each of these attributes, and it is argued that the highly prescriptive nature of the law makes it difficult for the

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[1] In spite of occasional high profile corporate failures and/or accounting scandals, the annual rate of audit failures, defined in terms of successful litigation or US Securities and Exchange Commission (SEC) sanctions, is nearly zero.

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accounting and audit professions to perform their role effectively (Baker & Hayes, 2005). While there is no clear indication that rules-based systems perform superior to their more flexible—principles-based—counterparts, there is growing evidence that they are in fact more costly (Trombetta, 2001). Furthermore, research suggests that such an approach may be insufficient to deter wrongdoing given that accounting fraud is difficult to discover or prove (Ronen, 2002).

This paper examines three basic research questions: (1) Did Sarbanes–Oxley introduce significant, unanticipated and negative firm effects; (2) If so, what are these effects, and what do they suggest about the relative quality of the legislation; and (3) How can policymakers benefit from this study? Our results suggest that Sarbanes–Oxley has produced unanticipated adverse firm effects, most notably centralization, a conservative bias in decision making, and a prominent managerial decision-making role for the independent auditors. An analysis of the data suggests that a pronounced fear of incrimination among managers is at least partially driving these effects.[2] We argue that such problems can be mitigated if policymakers count CEOs as important stakeholders and encourage their close involvement in the regulatory development process.

This paper seeks to contribute to the literature on Sarbanes–Oxley in several ways. First, we develop a conceptual model of the non-financial impacts of Sarbanes–Oxley, drawing from a comprehensive review of multiple literatures. While the law is likely to also provide firms with specific benefits, following a precedent in the literature, we focus exclusively on its potential to produce unintended "negative" consequences for firms.[3] In general, the effects we hypothesize appear to result from the law's overwhelming reliance upon stringent rules and punitive measures. Second, this is the first study to evaluate managerial perception of this important legislation, which is potentially more relevant than its actual costs (Buckley & Chapman, 1998).

Conceptual model

The following hypotheses were derived after a review and analysis of multiple literatures, and in certain instances, practitioner journals, as they may have more timely information on Sarbanes–Oxley. Comprehensive laws may produce effects that differ from what legislators initially intended (McAfee & Vakkur, 2004). As a result, the review seeks to identify (unintended) consequences not yet documented in the literature. Note that at least some of the effects we hypothesize could potentially benefit the firm. As a result, the survey evaluates the presence of a hypothesized effect and its impact upon the firm separately.

Hypotheses

H1: Sarbanes–Oxley will induce firms to centralize core processes for two main reasons: to increase business efficiency and as a safeguard.

[2] This may be referred to as "defensive management."

[3] These may also be referred to as unintended costs.

Increase business efficiency

Sarbanes–Oxley is a somewhat rules-based regime that requires firms to comply in an often mechanical and prescriptive manner. Since firms are not free to choose how to achieve the desired objective(s), certain adaptations may be required that can impair competitive advantages. Centralization is widely understood to decrease the cost of compliance and the risk of failing to comply (Marchetti, 2007). To illustrate, Springer Carrier centralized its IT systems, core operations, and manufacturing to reduce the cost and complexity of complying with Sarbanes–Oxley (Market Wire, 2006). Centralization of the audit function may also encourage centralization of core processes. However, inducing centralization may harm firms by increasing rigidity and impairing the contingent fit between a firm's strategic priorities and its contextual variables (Jermias & Gani, 2004). Since US firms (e.g., General Motors and Sears) already grapple with these issues, further centralization may harm firms (Freeland, 2001; McAfee, 2005).

As a safeguard

Cohen et al. (2007) found that Sarbanes–Oxley increased managerial risk aversion, while stringent repercussions—e.g., a criminal court trial and 20 years in jail—potentially await any manager guilty of transgression. Consequently, managers likely will seek to minimize the risk of non-compliance. Centralization reduces managerial uncertainty over financial reporting (GAO, 2002). By centralizing core functions, managers improve their knowledge and control over the firm's operations and financial statements, as is required for Section 302 certification.

H2: Sarbanes–Oxley will produce managerial bias in project selection due to three mechanisms: board independence measures, heightened liability concerns, and adverse selection.

Board independence measures

Ensuring board independence is among the objectives of Sarbanes–Oxley. However, research suggests this harms firms pursuing an innovation strategy (Gani & Jermias, 2006), increases CEO turnover (Laux, 2008), and decreases the frequency of candid interactions. It also has been found to inhibit board monitoring behaviors, and to reduce board involvement in firm decision making (Clark, 2005). Therefore, mandating board independence can be expected to impair CEO performance by inducing decision making stress and decreasing access to required information. Such factors can produce a conservative bias in decision making.

Heightened liability concerns

Support for this sub-hypothesis is found in the empirical research (e.g., Litvak, 2008; Iliev, 2007) as well as in a large-scale survey of 1200 corporate directors (Korn/Ferry, 2006). Liability concerns are motivated by the threat of harsh penalties, including significant prison sentences. For instance, violating Section 302—the managerial certification requirement—may lead to a fine of $5 million and 20 years in jail. Furthermore, the *mens rea* requirement for criminal regulatory offenses is relaxed, which broadens the scope of activities prosecutable under criminal law (Lerner & Yahya, 2007).[4] Prosecutors and juries also now have more discretion about what acts may be prosecuted. Managers, who are now more risk averse (Cohen et al., 2007), can be expected to respond by reducing their exposure to personal liability, preferring a low-risk, restrained growth strategy over a high-risk plan targeting market dominance.[5]

Adverse selection

(This sub-hypothesis suggests that a stringent rules-based regime attracts a suboptimal type of executive). In business matters, the ideal CEO is risk-neutral, willing to forego guaranteed 4% returns for riskier projects offering higher expected returns. However, in terms of the criminal law, most managers are risk averse, and willingly comply even in cases when a risk-neutral manager would not (Lerner & Yahya, 2007). In the optimal regulatory environment, the ideal executive thrives. However, when CEOs can be held liable regardless of fault, the ideal executive may prefer a less regulated environment, a trend already noted in prior research (Lerner & Yahya, 2007; Thornton, Byrnes, Henry, & Kripalani, 2006). Thus, managers whose risk preferences will reduce the value of the firm to its owners are more likely to avail themselves to firms subject to Sarbanes–Oxley.

H3: Sarbanes–Oxley will decrease the rate of firm innovation by increasing rigidity, diverting capital (away from R&D), and adverse selection.

Increasing rigidity

Wintoki (2007) finds that Sarbanes–Oxley has a negative impact on young, small growth firms, while Litvak (2008) finds that it burdens riskier and well managed firms. A potential factor explaining these findings is that the law increases the marginal cost associated with change—including beneficial changes that yield tangible improvements—due to the requirement that extensive documentation accompany all types of change. As a result, firms are likely to find change more difficult, reducing the total number of changes they seek to enact. As organizational learning is achieved through trial and error, innovation may easily be reduced.

Diverting capital

The law's resource requirements are significant. For instance, compliance spending at a leading bio-tech firm approximates the annual budget of its entire R&D department (Mullen, 2007). For firms with limited R&D budgets, innovation will suffer. As small firms are disproportionately innovative, this may have a pronounced effect.

Adverse selection

Research suggests executives have departed public firms due to excessive regulation, that managing regulatory details is now more relevant to the CEO's role than entrepreneurship, and that Sarbanes–Oxley deters innovation (Lerner & Yahya, 2007; Shadab, 2008). As the ideal manager will refuse a strict liability environment, we predict firm risk taking and innovation will be reduced.

H4: Sarbanes–Oxley increases the managerial role for accountants due to two factors: implementation authority and punitive authority.

Implementation authority

Even before Sarbanes–Oxley, research suggests auditing has an influential role in decision making (Salterio & Koonce, 1997). The law adds to this influence by defining internal controls to encompass nearly every firm process. Accounting firms are responsible for monitoring compliance, which has increased the power and earnings of the accounting firms (Pollock, 2006).

At the firm level, managerial decisions and compliance activities are linked, with each affecting the other. Managerial accounting has long been considered important to the development of firm strategy (Kaplan, 2006). Since failures to comply may be severely punished, managers can now be expected to seek greater input from auditors when making decisions. Anecdotal accounts suggest auditors currently influence the development of firm strategy along with a broad range of managerial decisions (Henry, France, & Lavelle, 2005).

Punitive authority

Under the law, accounting firms gauge compliance and have the ability to punish managers perceived to be non-compliant, by for example charging higher fees to particular clients (Lyon & Maher, 2005). Deloitte and Touche forced the firing of a CEO who neglected to disclose a bookkeeping error worth 1% of net income (Henry et al., 2005). Ina strict liability environment, this power has only increased, and accounting firms have allegedly used it to inflate demand beyond the level required by law. As a result, we suggest managers will engage auditors in managerial decision making, which potentially may decrease firms' long run firm profits.[6]

H5: Sarbanes–Oxley will decrease financial statement transparency due to: (A) a misguided focus, (B) adverse selection, and (C) a decrease in information quality.

Misguided focus

Audit quality depends upon having access to the right information (Simnett, 1996). Rules-based standards impose a rigid, one-sized-fits-all approach to accounting, which deter full and accurate disclosure (Carmona &

[4] Mens rea—or "guilty mind"—refers to criminal intent. Under Sarbanes–Oxley, managers who do not knowingly intend to engage in fraud can now be prosecuted for fraud. Prosecutors no longer have to prove intent.

[5] For example, Zhang (2007) estimates that, because of Sarbanes–Oxley, the market capitalization of US public firms fell by $1.4 trillion. Since there are approximately 10,000 publicly traded firms, the estimated net effect is approximately $140 million per firm. It is unlikely that this reflects the present value of the incremental direct compliance costs of the law. A switch to less risky corporate strategies (assuming that previous strategies were optimal) could easily reduce shareholders' wealth in the magnitude documented by Zhang (2007).

[6] A feasible alternative is that an emphasis upon cost control, risk management, and internal controls may benefit the firm. However, this alternative is not tested since we seek, following a precedent in the literature, to focus on the unintended (e.g., negative) consequences of the law.

Trombetta, 2008). Furthermore, highly prescriptive laws make it more difficult for accountants and auditors to detect and prevent inappropriate behavior (Baker & Hayes, 2005). Apparently, the law has caused firms to switch rather than reduce their earnings management techniques (Cohen, Dey, & Lys, 2005).

Bear Stearns, Lehman Brothers, AIG, and Washington Mutual were all Sarbanes–Oxley compliant, and yet each failed. Until Bear Stearn's collapse, senior executives and SEC Chairman Chris Cox insisted its liquidity was sound (Kearns & Onaran, 2008; Westbrook, 2008). While it may be argued that a lack of transparency was not crucial to these failures, some evidence suggests otherwise. For instance, balance sheet transparency was generally lacking, such that investors and firm managers were unable to adequately assess risk.[7] Even regulators have admitted the immensely difficult, if not impossible, task that the average investor faces in trying to comprehend firms' financial statements under Sarbanes–Oxley (Hewitt, 2007).[8] During the same period in which the information quality of firms' financial statements was decreasing (Rodgers, 2008), investors were falsely led to place greater trust in the general reliability of financial reporting (Pollock, 2007), as well as in Sarbanes–Oxley's purported ability to prevent a recurrence of the dramatic corporate failures of the 2000–2002 period.

Adverse selection

Over time, appropriate risk disposition CEO's may depart for less regulated environments, leaving behind a greater proportion of risk averse and risk-neutral/overly risk-seeking executives. The "ideal" CEO will readily bypass a project with a certain 4% gain in favor of a riskier project with expected returns greater than 4%. However, in regards to the criminal law she is risk averse, willingly paying the certain costs of compliance rather than risk being found guilty of a crime (Lerner & Yahya, 2007). This may be contrasted to the risk-neutral/risk-preferring CEO, who refuses to comply because the low detection probability renders the expected penalty less than the cost of compliance.[9]

A decrease in information quality

Cohen et al. (2005) found that the law fails to increase the information quality of earnings. With a rules-based regime, accountants are not required to possess a deep understanding of the economic and business factors influencing a firm's financial statements, but will tend towards a mechanistic application of the law (Carmona & Trombetta, 2008). Making matters worse, the accounting industry views adherence to the letter of the law to be an indispensable means of avoiding incrimination. (Henry et al., 2005; Wutkowski, 2009). Firms are forced to restate financial reports for increasingly smaller amounts: KPMG forced Countrywide Financial Corp. to restate its earnings because it held a 0.1–2.2% stake in assets booked as sold (Henry et al., 2005). Reports submitted to the SEC are now longer, more complex, and contain extensive footnotes. Firms' 10-K reports in the Dow Jones industrial average have doubled in average length over the past 6 years (Baker, 2008; Radin, 2008). Some firms now voluntarily disclose non-material, insignificant bookkeeping weaknesses that have only a remote chance of affecting financial statements. The result is a significant increase in disclosure related activities, the purpose of which is not to inform investors but to ward off potential lawsuits and/or to placate the increased demands of the firm's audit partner (Radin, 2008). Consequently, investors must process more firm disclosures, not all of which are informative.[10] The result is to dilute the quality and usefulness of financial statement information for the average investor—who lacks the ability to efficiently differentiate between disclosure types—and to increase monitoring costs.[11] As a result, investors may reduce their monitoring activities as firms disclose more information, paradoxically increasing the likelihood of fraud (Povel, Singh, & Winton, 2007).

H6: Sarbanes–Oxley will reduce worker incentives for workers and managers.

Individuals possess a limited capacity to engage in multiple problem solving activities simultaneously. Some firms have altered employee compensation schemes to incentivize compliance-related behaviors. This creates a reduction in the incentives attached to other work related activities (Holmstrom & Milgrom, 1991), potentially reducing productivity. Since firms cannot decrease workers' compensation in the short run, US competitiveness may be harmed. (Alternatively, firms can hire additional workers increasing overall operating costs).

Survey of executives

Methodology, sample and limitations

We developed a 25-item survey, included in the Appendix, to test our hypotheses. The survey was pre-tested with PhD students and researchers with advanced degrees. In addition, an earlier version was pre-tested on a convenience sample of 20 firms. The target population is CEOs of the Fortune 1000.[12] A random sample of 550 firms was selected, which we expected to yield a minimum sample of 100 completed surveys. Responses were ultimately received from 206 firms. All surveys were completed prior to July, 2007.

There are several important limitations to this study, one of which is that the dependent variable is not the ac-

[7] For an informal discussion see Acello, R. "$50 Trillion Worth of Obscurity." October. 2008. San Diego Magazine.

[8] The reference to Sarbanes–Oxley in this context is broad so as to include accounting rules specifically enacted in order to comport with the law by relevant standard setting bodies (e.g., FASB).

[9] This brief discussion is intended to be theoretical and is admittedly simplistic. Rather than focus on every factor likely to influence the managerial decision to comply with the law, we highlight only one potential aspect of that process—CEO disposition to risk.

[10] This practice may be referred to generally as "defensive accounting." For instance, information may be disclosed in a footnote, under the assumption it will go unread–a practice employed quite successfully by Enron.

[11] I assume two categories of disclosures: those that reveal useful information and those that are purely intended for defensive purposes.

[12] The most recent list of Fortune 1000 may be found at the following web address: http://money.cnn.com/magazines/fortune/fortune500/2009/full_-list/.

tual effect of the law, but rather how strongly management perceives a hypothesized effect to exist. Ideally we would like to assert a direct relationship between the survey data and the effects we hypothesize. Several factors prevent us from making such a direct connection. For example, executives may exaggerate their perceptions so as to promote regulatory relief from legislators. Respondents' perceptions may also be biased, meaning that participant firms may systematically differ from the target population as a whole. Survey research in general is particularly vulnerable to sampling error (e.g., individuals who differ in important ways are systematically excluded), a non-random selection process, and systematic differences between those who did and did respond to the survey (Fowler, 2008).

Bias is difficult or even impossible to completely eliminate. However, we minimized the potential for bias in the following ways. First, we selected our entire population for potential survey. As a result, we employed random sampling and eliminated many of the problems associated with more complicated selection methodologies. In addition, our entire population can be readily located. Consequently, for all practical purposes, the first two potential sources of survey bias can be ruled out (Fowler, 2008). To address the third potential source, we employed statistical analysis, which failed to reveal any systematic differences between participant and non-participant firms.

There is also the possibility that survey responses may be unduly influenced by managerial affinity for (aversion to) Sarbanes–Oxley, versus an objective assessment of the law's actual effects. One possible argument is that due to firms' ongoing capital requirements, CEOs may be incentive-aligned in favor of regulation that cost-effectively facilitates transparency. Transparency is central to firms' ability to raise capital—and ultimately to their ability to earn profits—as investors will not continue to supply capital without faith in the system (McAfee, 2004).

To address this potential bias, the survey asks very specific questions that pertain to the hypothesized effect(s) of the law on firms. This is helpful in that it is unclear how managerial affinity (aversion) might influence constructs like perceived centralization. In part, this is because the hypothesized effects arguably fail to reflect a pattern of bias regarding Sarbanes–Oxley. For most effects, a well reasoned argument may be made either in support or opposition to the law's merits. This suggests that it is ambiguous as to whether CEOs who perceive multiple hypothesized effects will be more (less) likely to view the legislation favorably. To test these relationships, the survey evaluates managerial perception in terms of (a) the law's hypothesized effects, (b) their impact upon firm value, and (c) the law's net impact.

Another potential source of measurement error is that CEOs may simply be mistaken. While this is possible, it is unlikely for several reasons. CEOs, as leaders of global firms, have withstood enormous challenges in order to implement Sarbanes–Oxley, providing ample opportunities to analyze its effects. Furthermore, more than any other stakeholder, CEOs have specific knowledge of the strategic challenges and opportunities facing the firm (Meckling & Jensen, 1998). In addition, Buckley and Chapman (1997) suggest that managerial perception of costs is more relevant than actual costs, and should be considered central to policy analysis.

Results

We examine whether (1) CEOs perceive the rules of Sarbanes–Oxley to have had unintended negative consequences and (2) what factors help to explain differences in CEO perceptions?[13]

First, we report summary statistics about our sample in Table 1. Unless otherwise noted, all results reported are based upon the full sample of 149 CEOs and 57 Directors ($n = 206$).

H1: Sarbanes–Oxley induces a centralization of core processes.

The mean response of "6" ($SD_x = 3.2$) indicates a significant perceived centralization effect, which was viewed as having "harmed the firm and/or decreased its value" ($u_x = 7.5$; $SD_x = 3.1$). Thus, managers do perceive the law to have induced the centralization of core processes, which often leads to greater rigidity (see Tables 2–4).

H2: Sarbanes–Oxley induces managerial bias in project selection.

The mean full-sample response ($u_x = 7$; $SD_x = 4.6$) indicates a strong perception the law has biased managerial decision making in favor of a conservative approach, which is believed to have detracted from firm value ($u_x = 9$; $SD_x = 3.3$). The survey also sought to evaluate which of the specific factors, as described in the hypothesis, contribute to the observed effect. Responses suggest management's desire to reduce exposure to civil and criminal liabilities under the law is a critical explanatory factor of managerial bias.[14]

H3: Sarbanes–Oxley decreases the rate of firm innovation.

This hypothesis was not supported ($u_x = 1$; $SD_x = 1.4$). Thus, it cannot be concluded that Sarbanes–Oxley has negatively impacted the rate of firm innovation.

H4: Sarbanes–Oxley increased the managerial role for auditors.

Respondents perceive ($u_x = 9$; $SD_x = 3.7$) that auditors gained managerial influence under Sarbanes–Oxley, and that this harmed the firm ($u_x = 7$; $SD_x = 2.1$). Respondents attribute this effect to accountants increased implementation authority under the law, and a perception that their additional authority has been misused.

H5: Sarbanes–Oxley reduced transparency for investors.

Survey responses ($u_x = 4$; $SD_x = 4.3$) reveal tepid support for this hypothesis, although there is significant dispersion of responses. Managers believe the law is narrowly focused

[13] The data was verified (using the Jarque-Bera test and a visual analysis of the histogram of the residuals) to be normally distributed. Additional statistical tests suggested that intraclass correlation and heterogeneity are not an issue.

[14] This may be referred to generally as "defensive management".

Table 1
Summary statistics, overall sample.

Hypo.	Item	Summary	Obs	Mean	Std. Dev	Min	Max
I	1	*Induced Centralization*	206	6	3.2	1	10
	1a	Decreased firm value	206	7.5	3.1	2	10
II	2	*Conservative decisions*	206	7	4.6	2	10
	2a	Decreased firm value	206	9	3.3	0	10
		Primary Mechanism:					
	2b	Hurt relations w/board	206	4	4.3	2	8
	2c	Decreased firm value	206	6	2.4	1	10
	2d	Liability concerns	206	10	3.7	4	10
	2e	Managerial departures|	206	4	3.3	0	6
	2f	Decreased firm value	206	3	2.1	0	5
III	3	*Decrease in innovation*	206	1	1.4	1	6
		Primary Mechanism:					
	3a	Increased rigidity	206	0	0.75	0	4
	3b	Less capital for R&D	206	9	7.6	1	10
	3c	Managerial departures ↑	206	1	0.9	0	5
IV	4	*Managerial role accountants*	206	9	3.7	0	10
	4a	Decreased firm value	206	7	2.1	1	10
		Primary Mechanism:					
	4b	Implementation authority	206	9	5.7	4	10
	4c	Hypervigilance	206	4	2.1	1	9
V	5	*Reduced transparency*	206	4	4.3	0	7
		Narrow focus	206	7.5	3.4	0	10
	5a	Investors less information	206	6	4.7	2	9
	5b	Decreased firm value	206	7	7.9	0	10
VI	6	*Reduced productivity*					
	6a	Worker productivity	206	<1	0.4	0	2
	6b	Manager productivity	206	7	4.8	3	10
NA	7	*Costs exceed benefits*	206	9	3.6	4	10
	7a	Tax upon firms	206	6	2.7	3	10
	7b	Harmed investors	206	5	4.9	0	9

Table 2
Summary statistics, mean by function.

Item **Summary**	**1** **Centralization**	1a ↓ Firm value	**2** **Conservative**	2a ↓ Firm value	2b Board relations	2c ↓ Firm value	2d Liability fears	2e Mgr. exits ↑	2f ↓ Firm value
Executive	6.39	7.7	6.9	9.2	4	6.4	10	4.2	3.2
Director	5	7	7.5	8.5	4	5	9.9	3.6	2.5

Item **Summary**	**3** **↓ Innovation**	3a ↓ Rigidity	3b ↓ $ for R&D	3c Mgr. exits ↑	**4. Mgr. role** **Accountants**	4a ↓ Firm value	4b Due to role	4c Power	**5** **↓ Transparency**
Executive	0.8	0	9.1	1	9.1	7.1	8.8	4.1	4.1
Director	1.5	0	8.8	1.2	8.75	6.8	9.5	3.9	3.75

Item **Summary**	5a ↓ Info. flow	5b ↓ Firm value	**6** **↓ Productivity**	6a For workers	6b For managers	**7** **Cost > benefit**	7a ≈ Tax	7b Hurt public
Executive	6.1	7.2		0.5	6.9	9.1	6.1	5
Director	5.75	6.5		0.4	7.5	8.8	5.9	5

Executive ($n = 149$).
Director ($n = 57$).
Survey contains complete list of items. For instance, Item #1 reads "Sarbanes–Oxley has induced your firm to centralize its core processes..."
A response of "0" indicates untrue or not at all, a "10" indicates entirely. The above scores reflect the mean response to each survey item.

($u_x = 7.5$; $SD_x = 3.4$) and has reduced information quality for investors ($u_x = 6$; $SD_x = 4.7$), thus decreasing monitoring effectiveness.

H6: Sarbanes–Oxley reduces worker incentives.

The hypothesis for line workers was not supported ($u_x < 1$; $SD_x = 0.4$), while it was supported for managers ($u_x = 7$; $SD_x = 4.8$). Managers perceived that requirements of Sarbanes–Oxley compliance usurped energy and time that would have been devoted to more profitable managerial activities.

Discussion

Much research on Sarbanes–Oxley has focused on accounting costs, while little is known about the poten-

Table 3
Ordered probit regression results.

Probit w/industry dummy Dependent variable	1 **Centralization**	1a ↓ Firm value	2 **Conservative**	2a ↓ Firm value	2b Board relations	2c ↓ Firm value	2d Liability fears	2e Mgr. exits ↑	2f ↓ Firm value
Survey item									
Market cap	**−0.0036*****	**−0.0036*****	**0.0045****	**0.0045****	**0.0045****	**0.0045****	**0.0045****	0.075	0.07
	[0.0008]	[0.0008]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	0.09	0.14
P/E ratio	0.041	0.041	0.049	0.049	0.049	0.049	0.049	0.049	0.049
	0.075	0.075	0.062	0.062	0.062	0.062	0.062	0.062	0.071
3-yr Trailing beta	**0.04****	**0.04****	**−0.051*****	**−0.051*****	**−0.051*****	**−0.051*****	**−0.051*****	−0.0001	**−0.051*****
	[0.0075]	[0.0075]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	0.0011	[0.0011]
Profit margin	−0.1	−0.1	0.0045	0.0045	0.0045	0.0045	0.0045	**−0.045****	**−0.045****
	0.4	0.4	0.03	0.04	0.04	0.04	0.04	0.0011	0.0011
Debt: market cap	**0.0039****	**0.0039****	**−0.055****	**−0.055****	**−0.055****	**−0.055****	**−0.055****	−0.01	−0.055
	[0.0007]	[0.0007]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	0.08	0.05
Observations	206	206	206	206	206	206	206	206	206
Log likelihood	−70.325874	−68.36	−61.45	−53.5	−71.4	−61.3456	−70.45	−53.234	−65.234
LR χ^2	89.08	86.59	77.84	67.77	90.44	77.71	89.24	67.43	82.63
Prob > χ^2	0	0	0	0	0	0	0	0	0

	3 ↓ **Innovation**	3a ↑ Rigidity	3b ↓ $ for R&D	3c Mgr. exits ↑	**4. Mgr. role** **Accountants**	4a ↓ firm value	4b Due to role	4c Power	**5** ↓ **Transparency**
Market cap	−0.05	**0.004****	**−0.05****	0.075	**0.0058****	**0.0058****	**0.0058****	**0.0058****	0.0044
	0.05	[0.001]	[0.0031]	0.09	[0.001]	[0.001]	[0.001]	[0.001]	0.0011
P/E ratio	0.06	0.06	0.06	0.049	−0.007	−0.007	−0.007	−0.007	−0.12
	0.49	0.49	0.49	0.062	0.05	0.05	0.05	0.05	0.3
3-Yr Trailing beta	**−0.0036****	**−0.0051****	**−0.0051****	−0.0001	0.018	0.018	0.018	0.018	**0.0144****
	[0.0008]	[0.0007]	[0.0007]	0.0011	0.04	0.04	0.04	0.04	[0.0012]
Profit margin	−0.0136	−0.0136	−0.0136	**−0.015****	**−0.048****	**−0.048****	**−0.048****	**−0.048****	0.0044
	0.02	0.02	0.02	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	0.02
Debt: market cap	0.04	0.04	0.04	−0.01	0.09	0.09	0.09	0.09	**0.05**
	0.8	0.8	0.8	0.08	0.11	0.11	0.11	0.11	[0.0011]
Observations	206	206	206	206	206	201	201	201	206
Log likelihood	−70.272	−61.8854	−54.7584	−46.4102	−62.4384	−54.1747	−62.38464	−45.9341	−64.2816
LR χ^2	91.5	80.58	71.30	60.43	81.30	70.54	81.23	59.81	83.70
Prob > χ^2	0	0	0	0	0	0	0	0	0

	5a ↓ Info. flow	5b ↓ Firm value	**6** ↓ **Productivity**	6a Of workers	6b Of managers	**7** ≈ **NPV < 0**	7a ≈ "Tax"	7b Hurt public
Market cap	0.1	0.0044		**0.0095****	**0.0095****	**−0.0057****	**−0.0057****	**–.0057****
	0.936	0.0011		[0.0013]	[0.0013]	[0.0011]	[0.0011]	[0.0011]
P/E ratio	0.0036	−0.12		0.005	0.005	0.049	0.049	0.049
	0.05	0.3		0.006	0.006	0.062	0.062	0.062
3-yr Trailing beta	**0.0056*****	**0.0144****		−0.04	−0.04	**0.075*****	**0.075*****	**0.075*****
	[0.0007]	[0.0012]		0.5	0.5	[0.0032]	[0.0032]	[0.0032]
Profit margin	−0.06	0.0044		**−0.0045****	**−0.0045****	0.0045	0.0045	0.0045
	[0.07]	0.02		[0.0011]	[0.0011]	0.0011	0.0011	0.0011
Debt: market cap	0.04	**0.05**		0.06	0.06	**−0.05****	**−0.05****	**−0.05****
	0.2	[0.0011]		0.15	0.15	[0.0011]	[0.0011]	[0.0011]
Observations	179	179		206	206	206	206	206

Log likelihood	−68.41344	−63.4613	−54.7661	−54.76608	−59.7801	−59.78013	−59.7801
LR χ^2	89.08	82.63	71.31	71.31	77.84	77.84	77.84
Prob > χ^2	0	0	0	0	0	0	0

The table reports coefficient estimates for probit regressions (the constant is not shown). Robust standard errors in brackets.
All regressions in this table control for industry fixed effects.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

tially broader, non-pecuniary impact of the law. This study, following DeFond and Francis (2005), seeks to increase our understanding of the latter issue. Consequently, while we acknowledge the legislation's broad potential to benefit firms, our survey focuses exclusively on its unintended "negative" aspects.[15] In summary, the survey suggests three main effects:

- ○ Centralization.
- ○ A conservative bias in decision making.
- ○ A managerial role for accountants.

The law's harsh legal repercussions—its reliance upon inflexible rules versus principles—are perceived as influencing a decrease in managerial risk taking. The implementation authority granted to accountants under the law is perceived as facilitating an increase in the managerial role for accountants. Arguably, this may also be a byproduct of an inflexible and prescriptive rules-based standard, where "rule checkers" are entrusted with greater power. In addition, the law appears to have induced centralization with additional rigidity. Executives reported changing core processes in response to Sarbanes–Oxley to minimize the cost of managing and simultaneously complying with the mandates of Sarbanes–Oxley. This is important since it is consistent with the view that Sarbanes–Oxley has a smaller impact on larger firms, since centralization is a way of making firms larger. The potential disadvantage is that firms—especially large firms re likely to become less nimble.

Conclusion and implications

Research suggests that rules-based standards impose costs upon firms (Carmona & Trombetta, 2008). Further, managerial perceptions of costs are relevant and are critical to policy analysis (Buckley & Chapman, 1997). We analyze managerial perceptions of Sarbanes–Oxley. Survey results suggest that managerial fear of incrimination fundamentally influences how CEOs perceive the law and its effects. Inflexible rules, coupled with greater opportunities for prosecution and stiffer penalties, has incentivized firm adaptations, at least in the perception of their CEOs, which reduce firm value. Given that stricter regimes are not unequivocally superior to principles-based standards (e.g., Trombetta, 2001), it may be argued that a principles based implementation may achieve the desired objectives more efficiently. Arguably, this study also increases an understanding of the potential effects of rules-based systems upon firms and their CEOs.

A potentially important takeaway of this study is its emphasis upon the policy relevance of CEO perception. Managerial scandals at Enron, WorldCom and other leading firms, helped to motivate Sarbanes–Oxley and tarnished the reputation of the public firm CEO. Arguably, one result was that CEOs were afforded a less central role in important policy deliberations, especially those pertaining to corporate governance. The net cost of failing to ade-

[15] These may also be referred to as unintended costs.

Table 4
Summarized ordered probit regression results for main hypotheses.

Survey item Control	**1** Centralization	**2** Conservative	**3** ↓ Innovation	**4. Mgr. role** Accountants	**5** ↓ Transparency	↓ Productivity **6a** Of workers	**6b** Of managers	**Additional** ≈ NPV < 0
Market cap	−**0.0036*****	**0.0045****	−0.05	**0.0058****	0.0044	**0.0095****	**0.0095****	−**0.057****
	[0.008]	[0.0011]	0.05	[0.001]	0.0011	[0.0013]	[0.0013]	[0.0011]
P/E ratio	0.041	0.049	0.06	−0.007	−0.12	0.005	0.005	0.049
	0.075	0.062	0.49	0.05	0.3	0.006	0.006	0.062
3-yr Trailing beta	**0.04****	−**0.051*****	−**0.0036****	0.018	**0.0144****	−0.04	−0.04	**0.075*****
	[0.0075]	[0.0011]	[0.0008]	0.04	[0.0012]	0.5	0.5	[0.0032]
Profit margin	−0.1	0.0045	−0.0136	−**0.048****	0.0044	−**0.0045****	−**0.0045****	0.0045
	0.4	0.0011	0.02	[0.0011]	0.02	[0.0011]	[0.0011]	0.0011
Debt: market cap	**0.0039****	−**0.055****	0.04	0.09	**0.05**	0.06	0.06	−**0.005****
	[0.0007]	[0.0011]	0.8	0.11	[0.0011]	0.15	0.15	[0.0011]
Observations	206	206	206	206	206	206	206	206
Log likelihood	−70.325874	−61.45	−70.272	−62.4384	−64.2816	−54.76608	−54.76608	−59.780133
LR chi2	89.08	77.84	91.5	81.30	83.70	71.31	71.31	77.84
Prob > chi2	0	0	0	0	0	0	0	0

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

quately incorporate CEOs in policy development decisions arguably may be considered equivalent to the sum of the (perceived) effects uncovered in this study.

Appendix

Introduction

The general purpose of this survey is to better understand and appreciate the overall impact that the Sarbanes–Oxley Act of 2002 has had upon your firm. The results of these interviews will be held strictly confidential and used only for the purposes of this study, funded by the RAND Center for Business Ethics. You will receive a copy of the final report.

In particular, we are seeking to evaluate the Non-pecuniary costs that the law has imposed on firms. Non-pecuniary costs, a term that originating in the law, refers to a loss that cannot be quantified monetarily, but which nevertheless detracts from the well-being or utility of the firm. Since they are not traded in markets, no market price exists by which to calculate damages. Research suggests several reasons why it may be difficult for managers to recognize even significant non-pecuniary costs incurred by the firm as a result of a particular regulation. As a result, this study seeks to evaluate the hypothesis that firms have incurred potentially significant non-pecuniary costs as a result of Sarbanes–Oxley.

In making your responses, please focus on your own firm's experiences, versus what you may have read or discussed with colleagues. This survey may be completed in as little as 20 min, depending upon your answers.

Survey items

Before beginning, please attest that you have a high level of familiarity with the Sarbanes–Oxley Act as well as the impact it has had upon your firm. If you do not, please do not complete the survey.

In responding the remaining survey items, please adhere to the following "0–10" scale:

Response	Interpretation	Effect perceived as...
$0 < y \leqslant 1$	No effect (untrue)	NA
$1 < y \leqslant 4$	Effect (true)	Moderate
$4 < y \leqslant 7$	Effect (true)	Significant
$7 < y \leqslant 10$	Effect (true)	Dominant

All items relate to the firm where you are principally employed. Prior to responding, please read carefully the explanations and definitions that were provided separately. All descriptions and definitions were taken from the study text and various business dictionaries, and are necessary to understand the question in its proper context.

(1) Sarbanes–Oxley has induced your firm to centralize its core processes (e.g., manufacturing, management, IT, but exclude from your response any centralization of the accounting function).
   (a) This effect—if observed—has harmed the firm and/or decreased its value (e.g., by increasing rigidity or decreasing the ability of the firm to respond to environmental threats).

(2) Sarbanes–Oxley has influenced managerial decision by causing it to become more conservative.
   (a) This effect—if observed—has harmed the firm and/or decreased its value.
   (b) As a result of the law, the quality and frequency of communication between the firm's board of directors and its senior executives has decreased.
   (c) This effect—if observed—has harmed the firm and/or decreased its value.
   (d) Heightened liability concerns have motivated an increased tendency in favor of conservative managerial decision making, which has harmed the firm?

(e) As a result of Sarbanes–Oxley, talented, entrepreneurial managers are now more likely to depart public firms in favor of environments with less regulation (e.g., private equity).
(f) This effect—if observed—has harmed the firm and/or decreased its value.

(3) As a result of the law, the rate of firm innovation, in your view, has decreased.
(a) This effect—if observed—has resulted from an increase in rigidity (e.g., rules, regulations).
(b) This effect—if observed—has occurred since the capital needed for R&D has been diverted into compliance.
(c) This effect—if observed—has resulted since strong leaders who champion innovation have departed the firm in favor of less regulated markets (e.g., private equity).

(4) Sarbanes–Oxley has increased the managerial role of accountants, such that accountants are now more involved in managerial decision making because of the law.
(a) This effect—if observed—has harmed the firm and/or decreased its value.
(b) The increase in the managerial role of accountants—if observed—results from the implementation authority (e.g., role in determining who is and who is not in compliance) accounting firms received under the law.
(c) The increase in the managerial role of accountants—if observed—is a result of an increase in power (e.g., ability to punish managers by calling upon regulators) accounting firms received under the law.

(5) On the whole, Sarbanes–Oxley has reduced transparency by forcing organizations to focus inordinately on one aspect of transparency (e.g., internal controls) at the expense of other, equally relevant transparency measures.
(a) As a result of the law, investors have less access to the type of information needed to guide their investment decision than they did prior to the law.
(b) This effect—if observed—has harmed the firm and/or decreased its value, in part by decreasing the ability of investors to monitor managers.

(6) Sarbanes–Oxley has reduced the productivity of ___________ who now has less time to devote to regular duties after satisfying compliance requirements.
(a) The average worker.
(b) The average senior manager.

(7) Sarbanes–Oxley was a legislative error: Congress enacted a law whose costs far outweigh its benefits.
(a) Sarbanes–Oxley, on the net, has harmed firms. As such it represents a pure tax upon firms.
(b) Sarbanes–Oxley, on the net, has harmed investors. As such it has produced higher prices or reduced quality products with little to no compensatory benefit.

(8) The survey was clear, and no difficulties were encountered in completing it.
(a) The definitions and supplementary explanations provided were useful.

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