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INCREASING FIRM VALUE THROUGH DETECTION AND PREVENTION OF WHITE-COLLAR CRIME

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White-collar crime can cost a company from 1 percent to 6 percent of annual sales, yet little is known about the organizational conditions that can reduce this cost. Previous governance research has examined the link between block holders, boards of directors, or CEO compensation and fraud. In this study, these traditional measures of governance are found to have little impact. Instead, operational governance, including clarity of policies and procedures, formal cross-company communication, and performance-based pay for the board and for more employees, significantly reduces the likelihood of a crime commission. Copyright © 2003 John Wiley & Sons, Ltd.

INTRODUCTION

The economic impact of fraud is immense. Estimates of the cost of white-collar crime to companies in the United States range from $200 billion (Touby, 1994) to $600 billion per year (Association of Certified Fraud Examiners (ACFE), 2002). This is massively greater than street crime losses of $3–4 billion (Baucus and Baucus, 1997) and total economic loss to victims of personal and property crimes of $15.6 billion (Bureau of Justice Statistics, 1999). Fraud can significantly impact the financial performance of a firm as it can cost a typical company between 1 percent and 6 percent of annual sales (Hogsett and Radig, 1994; Touby, 1994; ACFE, 2002). White-collar crime alone causes 30 percent of new business failures (Agro, 1978), without regard to the quality of the firms' strategy or assets.

Fraud has brought down many apparently well-performing firms. Enron, Sunbeam, Cendant, and Waste Management are some of the most recent and spectacular examples. Even before Enron's collapse, the U.S. Securities and Exchange Commission was investigating more companies than ever for possible accounting fraud (Roland, 2001). The ability to prevent fraud, or value loss through fraud, has become a potential source of competitive advantage and improved financial performance for firms in today's economy.

This paper investigates whether firms' governance systems influence the probability of white-collar crime. Governance systems comprise not only the board of directors and the CEO, but also operational systems within the firm through which management can influence the firm. Components of these systems have been examined with respect to their role in strategy process[1]

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[1] Process has to do with 'how' a firm gains a competitive position (Schendel, 1992), and relates to an understanding of both how to develop these processes to 'develop good strategy, and then go on to develop those processes necessary to use the strategy to operate the firm' (Schendel, 1992: 3).

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(Marginson, 2002), but not with regard to their impact on crime.

The investigation includes what might constitute failure of governance as well as providing some direction as to what might constitute more effective governance. Understanding or identifying the variation in governance systems between firms with crime and those without it provides insight toward the reduction of white-collar crime in all companies.

The governance differences between firms with crime and those without it is investigated using a sample of 114 firms, composed of matched pairs of firms, half with announced white-collar crimes and half without from 1988 to 1998. The key findings are that a firm's clarity of policies and procedures, formal communication, and contingent pay for employees are associated with less white-collar crime. Additionally, audit committees, contingent pay for board members, and codes of conduct are also associated with fewer crimes. No other board- or CEO-level variables, such as CEO compensation or percentage of outsiders on the board, have any impact on crime. This paper contributes to the literature on fraud research and to our understanding of the process of reducing fraud in organizations.

THEORY AND HYPOTHESES

Previous governance research has not addressed crime extensively, and the few studies that have generally focused on board-level variables rather than the organizational conditions that encourage or prevent crime. The researchers who have studied different operational governance mechanisms have generally done so one at a time. This study integrates the research of board-level variables with the multiple streams included in operational governance research to develop a set of mechanisms that may impact the occurrence of white-collar crime.

Previous governance research is largely derived from agency theory and has focused primarily on the structure of ownership (Abrahamson and Park, 1994), the board of directors (Abrahamson and Park, 1994; Beasley, 1996; Kassinis and Vafeas, 2002), or CEO compensation (Boyd, 1994). This research found that governance structure could influence white-collar crime. For example, Alexander and Cohen (1999), studying 78 public firms with crimes committed during 1984–90, find that crime occurs less frequently among firms in which management (officers and directors) has a larger ownership stake. They conclude that penalizing shareholders through both corporate fines and the negative stock price reaction on announcement deters crime, and corporate crime tends not to benefit shareholders *ex ante*.

The focus of this previous research is critical, since boards of directors are the 'apex of the decision control systems of organizations' (Fama and Jensen, 1983: 311). However, there are other theory-inspired mechanisms beyond the board, the CEO, and the structure of ownership to monitor and control management. Fama and Jensen (1983: 310) argue that mutual monitoring systems and decision hierarchies supported by 'organizational rules of the game, for example, accounting and budgeting systems' are critical for efficient decision control and monitoring of management. There has been much less work in the area of 'organizational rules' or operational governance and, as a result, there is a need to link previous governance research with that of the organizational rules of the game.

This study examines what might constitute operational governance and how it might impact the occurrence of white-collar crime in a firm.

Operational governance

Fama and Jensen (1983) mention mutual monitoring, accounting, and budgeting systems as critical for ensuring that management's decisions are made with the interests of the shareholder in mind. Jensen and Meckling (1976: 308) include 'budget restrictions, compensation policies, operating rules, etc.' as important in monitoring management. These systems represent agency theory's ideas of the organizational rules of the game. This is related to the research on internal control. Internal control helps assure effectiveness and efficiency of operations, reliability of financial information, and compliance with applicable laws and regulations (Kinney, 2000).

These 'organizational rules of the game' have also been researched under the term 'management control.' Management control is the broad term that is related to the budgeting, planning, and accounting systems in a firm. Management control gives managers 'an explicit tool for strategy implementation' (Daft and Macintosh, 1984: 63) and

'involves target-setting, activity-monitoring, and deficiency-correcting activities' (Daft and Macintosh, 1984: 63). Management control can also be considered 'the process by which managers influence other members of the organization to implement the organization's strategies' (Anthony 1988: 10).

The quality or success of the management or internal control can affect the possibility of employee misconduct in a firm. For example, Leatherwood and Spector (1991) find that enforcements reduced employee misconduct. They find that inducements play a role as well, and that both enforcements and inducements have independent (not interactive) effects on reducing the likelihood of employee misconduct.[2] Russell (1995) argues that widespread corporate fraud often requires a failure in internal control or operational governance systems. Some of the characteristics of a company at high risk for fraud are: weak, loose, or no enforced internal controls; poor financial and operational planning; poor company loyalty, low morale and work motivation; unusual turnover; or rapid company expansion.

This research demonstrates that operational governance mechanisms influence crime commission. As these mechanisms reduce crime, they have the ability to improve firm performance, as do the high-level mechanisms. The next section discusses these mechanisms individually and explores their ability to impact crime commission. Figure 1 illustrates this relationship.

Operational governance mechanisms

Many employees have the opportunity to commit white-collar crimes. In fact, several studies have shown that 30 percent of employees plan to steal, 30 percent may give in to temptation occasionally, and only 40 percent would resist this temptation[3] (Hogsett and Radig, 1994). While management may not be able to affect the 30 percent who plan to steal, they can affect the 30 percent who may occasionally give in to temptation by understanding the role of operational governance.

An accounting system comprises 'the methods by which financial data about a firm or its activity are collected, processed, stored and/or distributed' (Bruns, 1968: 470). The activities of collecting and processing are potential sources of error. Indeed, 'errors and inaccuracy in the process of measuring, counting and reporting are inevitable' (Bruns, 1968: 472). Better systems can reduce the degree of error. Better systems can also lead to less opportunity for funds or inventory to be redirected

[2] Their definitions are: enforcements (monitoring, auditing, etc. to detect, and penalties, suspension, or prosecution to deter) and inducements (contingent compensation, options, profit sharing, used mostly to align interests of agent with principal).

[3] Bologna (1980) found 20 percent to be honest, 20 percent to be dishonest, and 60 percent to be as honest as the situation allows.

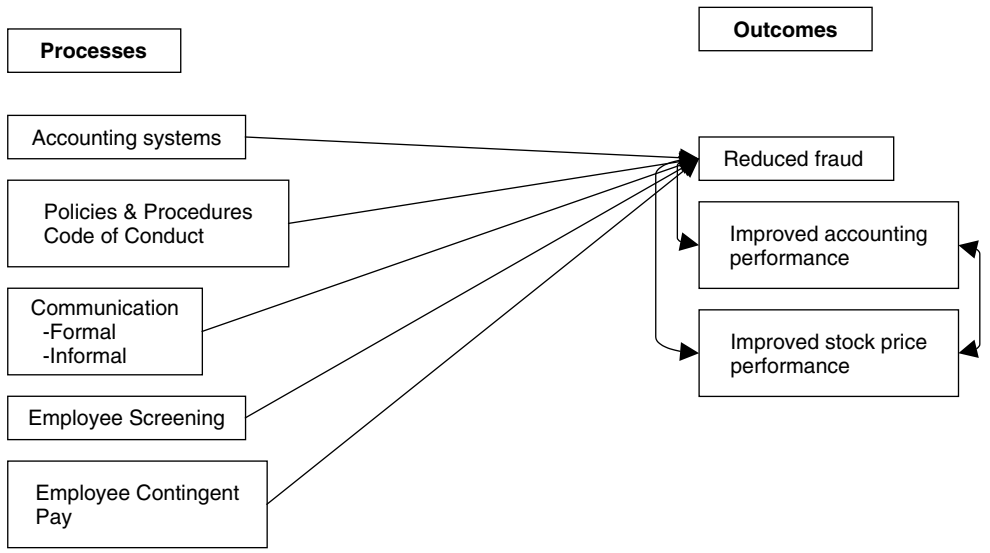

Figure 1. Operational governance mechanisms, fraud reduction and firm performance

for personal use. An accounting system that is designed only to provide reasonable assurance that errors and inaccuracies are few can be seen as a weak system when compared to a system that frequently faces self-examination, modification, extensive employee training, and a sense of organizational responsibility for better reporting.

Firms have in place many policies to reduce or discourage fraud, beyond the accounting system. Ineffective written policies can contribute to the incidence of white-collar crime (Turner and Stephenson, 1993; Russell, 1995; Hooks *et al*., 1994). Bell *et al*. (1998) find that where management frequently overrides controls and does not segregate duties, audit differences classified as fraud are more prevalent. Indeed, 'lax management attitudes, particularly toward internal controls, have frequently been linked to fraud and its detection'(Holmes *et al*., 2002: 85).

A company that has clear divisions of responsibility, has communications geared toward company-wide understanding of policies and procedures, has a required management program that reinforces the importance of key policies, procedures and systems, and has a company-wide program designed to identify, analyze, and address basic problems in the workplace can be said to have clearer policies and procedures than a firm that pays less attention to ongoing education and training in what constitutes the corporate policies and procedures.

Thus, two foundational components of an operational governance system are the accounting system and the policies and procedures within the firm (Fellner and Mitchell, 1995). Thus:

Hypothesis 1: The stronger a firm's accounting system, the less likely it is to have white-collar crime.

Hypothesis 2: The clearer a firm's policies and procedures, the less likely it is to have white-collar crime.

A code of conduct is a policy or procedure that is specifically targeted to reduce unethical behavior. As such, it deserves special attention. Lack of a code of conduct can contribute to white-collar crime (Turner and Stephenson, 1993). In addition, clear expectations of behavior, company loyalty, and management integrity may strongly influence the incidence of white-collar crime (Mitchell *et al*., 1996; Russell, 1995; Hooks *et al*., 1994). The existence of a code of conduct can help with the explicit nature of the expectation of behavior (Turner and Stephenson, 1993). Clear expectations reduce uncertainty about choices of actions. Employees, in many cases, desire more detail as to what is acceptable within a firm (Weeks and Nantel, 1992; Pascale, 1985).

Previous research has found that just having a code of ethics may not necessarily reduce commission of a crime. Instead, a code needs to be comprehensive. The more specific it is, the more likely it is to reduce illegal behavior. Mitchell *et al*. (1996) found that the mere presence of a code of conduct has no impact. In a study of 63 organizations, Key, Messina, and Turpen (1998–99) find that executives at firms with known or suspected occurrences of fraud identified poor internal controls and weak ethics policies as the two primary contributors. When the ethics code is specific and consistently enforced, it reduces the opportunity for commission of a fraud and makes it difficult for employees to rationalize prohibited behavior. Fifty-three percent of the 1000 members of the Institute of Management Accountants' cost management group believe that a strong, comprehensive ethics policy reduces the overall cost of internal control (*Journal of Accountancy*, Anonymous, 1994). Such a policy would include a clearly articulated code, management training in following the code supplemented by an annual review, and communication of the code to all employees. Thus the following hypothesis that the quality of the code of conduct can impact crime commission:

Hypothesis 3: The stronger and more comprehensive a firm's code of conduct, the less likely it is to have white-collar crime.

Organizational communication is a 'system binder' that facilitates internal control and stability (Almaney, 1974). Communication is also 'integral to each phase of the accounting cycle and to the overall understanding of the operational processes of the organization' (Fellner and Mitchell, 1995: 80). Fraud involves concealment and communication fosters openness (Hooks *et al*., 1994). More organization-wide communication, and greater intensity of communication, can reduce occurrences of fraud. For example, upward communication, such as face-to-face meetings or letters with management feedback, can preempt

some problems or alert management early to their presence (Ettore, 1995).

Communication not only flows up or down, but laterally and diagonally as well (Sonnenberg, 1991). Lateral relations facilitate interunit communications. Lateral relations are not communication events *per se*; rather, they provide an opportunity for communication to exist. Without these opportunities, communication would be much more difficult. Lateral relations consist of joint work in teams, task forces and meetings (Ghoshal, Korine, and Szulanski, 1994; Hoskisson, Hill, and Kim, 1993). Job rotation and management development programs can also facilitate lateral relations. These procedures are also a powerful tool for organizational socialization (Gupta and Govindarajan, 1991; Martinez and Jarillo, 1989). Communication can occur on a formal basis, with the intention to communicate about certain topics. These are often occasions arranged by the organization, for example a training event involving geographically dispersed employees, a job rotation program, or several employees whose job it is to compare divisions and transfer methods and practices throughout the organization. Communication can also be informal or ad hoc, outside of the company's express purpose. Such informal communication can occur at the training event mentioned above, during a break, for example. Such communication can also occur at any team meeting. It is hypothesized that both forms of communication can have an impact on crime:

Hypothesis 4: The more formal communication opportunities a firm has, the less likely it is to have crime.

Hypothesis 5: The more a firm provides opportunity for informal communication, the less likely is it to have crime.

White-collar crime reduction should begin with the careful screening of potential employees, which may identify some of the potentially problem individuals (Stavros, 1998; Martin, 1998; Turner and Stephenson, 1993; Gardner, 1998). A potential employee's former employment, educational record, financial situation, and criminal record can all be checked. Such an exercise can reveal 'red flags' (Stavros, 1998). The care that companies take during the hiring process can vary: '... many employers base their hiring decision on their "gut feeling" about a person. More often than not, that instinctive response is accurate ... but not always' (Stavros, 1998: 31). Careful employee screening can reject employees who have higher than normal proclivities to illegal behavior. Thus:

Hypothesis 6: The more attention the firm pays to employee screening, the less likely it is to have crime.

An employee at any level may pursue opportunistic behavior at the expense of the organization. Direct supervision cannot monitor all employee behavior. Instead, peer (or mutual) monitoring may partially substitute. Mutual monitoring can be encouraged through gainsharing programs, and supported through certain organizational characteristics. For example, reward systems can be structured so that the acts of individuals in the group threaten all group members (Trevino and Victor, 1992). Mutual monitoring supported by a mutual reward system tends to be associated with lower labor costs, high productivity, good product quality (Schuster, 1984), and improved employee attitudes (Hatcher, Ross, and Collins, 1989). 'Employees are more likely to steal if they feel a company was unfair to its employees' especially if they feel personally mistreated (Buss, 1993: 37). When an employee stock ownership system has meaningful equity, information, and influence, it produces psychological ownership, which leads to a bonding or integration of the employee–owner with the organization (Pierce, Rubenfeld, and Morgan, 1991). Thus:

Hypothesis 7: As a greater percentage of the employees in the firm are rewarded for firm performance, the less likely the firm is to have white-collar crime.

METHODOLOGY

Sample creation

In this study, the firms that have committed white-collar crime were identified through a Lexis-Nexis search of *The Wall Street Journal* from January 1, 1988 to December 31, 1998.[4] Articles were

[4] The crime-related search terms were obtained from a listing of the types of white collar crimes in *Fraud: Bringing Light*

eliminated that (1) did not discuss economic crime within the firm; (2) dealt with an economic crime either committed outside the United States or committed by a foreign firm within the United States; or (3) discussed economic crime in private firms. This elimination left 204 articles containing an announcement of a white-collar crime. Firms in the defense, financial services, power (energy), or healthcare (related to Medicare fraud) industries were also eliminated. These industries have extensive regulation and so occupy an environment where what might be a 'gray' crime in another industry is 'black' in the industries mentioned, or where it is difficult to separate an intentional fraudulent act that can be prosecuted in a civil or criminal court from an unintentional error or another form of violation. For example, a data entry error may lead to a Medicare fraud charge without any fraudulent intention. The energy firms are often charged with environmental crimes. While these may be genuine crimes, often it is difficult to separate the environmental violation from the civil or criminal violation. There were 161 occurrences remaining in the sample following this filter.

The firms named in these announcements were then checked for data availability. The U.S. Securities and Exchange Commission (SEC) requires public firms to publish annual reports, 10Ks and proxy statements. These were gathered for the firms for which these documents existed. The SEC data were gathered for the year prior to the announcement of the crime. This was to ensure that the firm governance conditions were those that coexisted with the crime. If a company committed a separate crime twice in the time window, they and their match were entered twice, once for each year. The final sample represents 77 occurrences of crimes representing 57 firms. Eight firms had two crimes in the time window included in this study—two had three crimes, one had four crimes, and one had six. Table 1 illustrates the filtering process.

Matched-pair design is an acceptable method when studying why otherwise similar subjects have different outcomes.[5] In this case, one member of a pair had a crime announcement, and one member did not. Characteristics used to match firms included primary industry, asset size, and similar numbers of industries (4-digit SIC codes) outside of the primary industry. These characteristics were recorded for the 'crime firms' in the year prior to the announcement of the crime. In order to find the best matches, I first generated a complete list of the firms in the primary 4-digit SIC code in that same year. Then I identified all firms in that 4-digit SIC code that were half as large to twice as large in asset size as the crime firm. This list of firms was compared with the descriptions of the businesses either in Hoover's corporate descriptions or in the beginning of the 10K for each firm. The firm with the closest description in terms of primary industry and other industries if the firm was somewhat diversified was selected. This second step in matching was necessary as SIC codes are often not very informative and sometimes only distantly related to the primary business of the firm. In some cases, when a firm's business description did not match its SIC code, it was rematched in the SIC code that was a better description of its business. For example, Cendant (which was CUC at the time

Table 1. Generation of the crime-firm sample

Filter	Number remaining
First search	Tens of thousands of articles
Economic crime, in U.S., by U.S. firm, public company	204 announcements of separate crimes
Not defense or healthcare or financial services or power industry	161 announcements of separate crimes
Data availability and reasonable match	77 announcements of separate crimes, 57 firms

to the Dark Side of Business by Albrecht, Wernz, and Williams (1995). The list of terms generated from this book's comprehensive description is as follows: fraud, kiting (false checks—a form of embezzlement), skimming (a form of embezzlement), lapping (a form of embezzlement), bilking, embezzling, larceny, theft, kickbacks, overbilling, swindling, price fixing, bid rigging, racketeering, defraud, fraudulent.

[5] Matched-pair design is most common in epidemiology, where the focus is more on what might be associated with contracting a particular disease. In these cases, individuals are matched on age, gender, socioeconomic status, ethnicity, etc. In this case, 'crime' is the disease, and firm characteristics substitute for individual characteristics. Matched-pair design also has implications for the methodology employed, which will be discussed later. A discussion of the methods can be found in Holford (2002). Previous studies incorporating a matched-pair design include McConaughy *et al*. (1998), who paired founding family controlled vs. low managerial ownership firms, and matched on sales and industry, and Teece (1981), who paired on low vs. high performance and matched on product lines and sales.

the crime was committed) is classified in SIC code 4724 (travel agencies), and its match is Damark. Damark is classified in SIC code 5961 (catalog and mail order houses). Below are excerpts from their 10Ks:

> CUC International Inc. (the 'Company') is a membership-based consumer services company, providing consumers with access to a variety of services. These memberships include such components as shopping, travel, auto, dining, home improvement, lifestyle, vacation exchange, credit card and checking account enhancement packages, financial products and discount programs. (CUC, 1995, 10K, p. 3)

> Damark's products and services are offered through mail order catalogs and a variety of membership clubs which provide members discounts on travel, hospitality, entertainment and merchandise purchased through its catalogs. (Damark, 1995, 10K, pp. 2–3)

Some of the matches are for firms that are some distance apart in asset size. However, the scopes of diversification of the firms are similar, they are in identical businesses, and there was no closer match. Size was also controlled for in the empirical tests.

Measurement of variables

Most of the variables used in this study are combinations of numbers readily found in the firm's annual reports, proxy statements or 10Ks. For example, the percentage ownership of the CEO or the number of meetings of the board of directors is easily found and are unambiguous numbers. The other variables are much more difficult to generate.

A modified form of content analysis is used for the operational governance variables in order to find references to particular characteristics of the firm, and then code those references on a scale of 1 to 7, based on details about those characteristics. This procedure analyzed the context of the words, not the number of times certain words appeared or their position in a sentence as in traditional content analysis.

Content analysis has been previously used in organizational research. Traditionally, it involves identifying constructs of interest, determining what terms are included in that construct, then counting the occurrence of those terms in sample documents that are interpreted as indicating the degree of the presence of the original constructs (see Popping, 2000, for an historical review of the evolution of content analysis). Most organizational research that has used content analysis has primarily used annual reports and a dictionary to search for terms in the annual reports. The number of occurrences of the terms was then quantitatively analyzed (Arndt and Bigelow, 2000; Bowman, 1984; Abrahamson and Park, 1994).

For this study, content analysis software was used to retrieve each mention of a firm's accounting system. Then, based on the context of the terms, or the description of the variable in question, I scored the strength of that variable on a 1 to 7 scale. I term this method 'content-context analysis.' Table 2 shows the variables for each theoretical grouping and the outline of the measures used for the content-context analysis variables.

Specifically, for each company and year (crime as well as noncrime firms), electronic versions of the SEC documents were imported into a qualitative data analysis software package called NUD*IST.[6] Using NUD*IST, nodes, or files, were created for each variable, and a scoring dictionary was developed to use for the search terms. A text search function was created to find the words in the dictionary in all the documents and to retrieve the line that the word appeared in, as well as 10 lines on either side for the context. The retrieved text was saved at the node (or in the file) belonging to that variable. For example, in searching for references to a firm's accounting system, I searched for references to accounting or internal controls. Any reference that was not relevant was deleted. For example, in searching for policies and procedures, one of the search terms is 'document'. In downloading the electronic documents from the Securities and Exchange Commission, each electronic document includes the term 'document' in the header as well as the 'document date,' reflecting the date the document was completed. Neither of these references have anything to do with that particular firm's policies or procedures. This process can be repeated without creating inconsistencies.

The retrieved text was reviewed and any noninformative text was deleted. Any reference that would belong elsewhere was also deleted. For example, there would often be references

[6] QSR NUD*IST (1997) from Qualitative Solutions and Research Pty Ltd.

Table 2. Summary of operating governance variables and measures

Theoretical grouping	Variable	Measure
Organizational rules	Accounting system	Scale 1–7; higher numbers represent more communication throughout the company as to maintaining the integrity of the accounting system, as well as periodic reviews and changes
	Policies and procedures	Scale 1–7; higher numbers represent more communication of policies throughout the organization, training, clear responsibility, formalization.
Communication	Liaison roles (formal communication)	Scale 1–7; higher numbers represent greater company-wide interaction among employees
	Teams (informal communication)	Scale 1–7; higher numbers represent greater use of teams, and more cross-functional or cross-geographic use
Code of conduct	Code of conduct	Scale 1–7; higher numbers represent more specific codes, with greater company-wide education and management responsibility
Employee screening	Employee screening	Scale 1–7; higher numbers represent more background checking for qualifications, better interviewing and recruiting
Incentive alignment	Contingent pay for employees	Scale 1–7; higher numbers represent more contingent pay available to more employees

to policies and procedures near accounting references. Policies and procedures is a separate variable, and the references were filed there instead. For each company there are several paragraphs on the accounting system that were generated by search words.

These paragraphs were read and assigned a value from 1 (meaning weak, few controls or cross-checks, selecting which principles to use, little top management attention beyond formal signing off) to 7 (strong, controls that are reviewed and changed, top management attention and interest). The company name or its crime status was not known during the coding process. This method is similar to the case survey method employed in Larsson and Finkelstein (1999). In that study, they developed a 5-point scale to convert qualitative data into quantitative data.

Each company ended up with the highest score they obtained from any one document. In other words, if a company was being scored for their accounting system, and if they received a 4 on the proxy statement, there was no information in the annual report, and a 5 in the 10K, this company would be awarded a 5. The numbers were not averaged or totaled for several reasons. First, there is a significant amount of repetition between 10Ks and annual reports. Generating a total or an average would not have reflected this repetition. For example, a firm could receive a 5 based on information in the annual report, and a 5 based on an identical paragraph in the 10K. If this was summed, the firm would receive a 10 (assuming no information in the proxy statement), but the 10 would reflect identical information, not additional, new information above a 5 category. Second, each document, in general, has a different focus. The annual report's focus is to shareholders and anyone interested in the company, the 10K to regulators and analysts, and the proxy statement to voting shareholders (some individuals, mostly institutions). As a result, averaging would take away some of the information contained in the scores. For example, a firm receiving a 3 for Code of Conduct from the annual report, and a 0 elsewhere, would end up with a 1 overall. Third, the amount of repetition (as mentioned in point one) vs. the amount of unique information per documents (point two) varies significantly over the measures. As a result, in order to not over-reward repetition, and yet maintain some variance between levels of variables, I chose to use only the highest number from each firm.

The specific operational governance variables are directly related to the hypotheses. They include information on the accounting system, on the written policies, procedures, job descriptions, whether or not there are liaison roles or permanent or temporary teams, and the extent of integration within the firm (Martinez and Jarillo, 1989; Hoskisson *et al*., 1993; Gupta and Govindarajan, 1991). Appendix 1 shows the search terms for each

content-context variable as well as text excerpts that reflect the range of each variable. Appendix 2 contains the scoring system for each content-context variable.

In order to assure quality in my coding scheme, a second rater coded a random subsample of the data set. For a random subset of approximately 20 percent, I generated 16 random numbers between 1 and 77 to identify 16 random crime firms and their matches for a total of 32 firms (20.8% of the entire sample; 10–15% has been considered sufficient (Fan and Chen, 2000)). I then retrieved the text from the original searches for these firms across all the content-context variables: accounting system, policies and procedures, code of conduct, formal communication, informal communication, employee screening, employee contingent compensation, and audit committee strength. I trained a second coder on the process and scoring sheet. The coder was not informed as to which firms were crime firms and which were not. We adopted a consensus approach for variables where the two coders disagreed. This method follows Larsson and Finkelstein (1999). The consensus approach allowed us to reexamine the scales and our own reasoning. The coding scales were critical to ultimate resolution of disputes. Percent agreement ranged from 84.38 percent to 100 percent, where 65 percent is considered a benchmark (Larsson and Finkelstein, 1999: 21), with kappas of 0.81 to 1.00, where greater than 0.60 is considered substantial agreement (Stata 7.0 Reference Manual H-P, 2001: 150). See Table 3 for the information by variable.

Controls

The variables used to control for traditional governance mechanisms include blockholders (Coffey and Fryxell, 1991), CEO duality (Boyd, 1995; Finkelstein and D'Aveni, 1994), the proportion of board insiders vs. outsiders (Hermalin and Weisbach, 1991), audit committees (McMullen, 1996; McMullen and Raghunandan, 1996), board compensation (Hermalin and Weisbach, 1991), director and CEO stock ownership (Alexander and Cohen, 1999), and CEO compensation (Boyd, 1994; Jensen and Murphy, 1990).

These variables are not only important to control for because of their extensive use in previous governance research, but also because they should impact white-collar crime commission. For example, an independent board is more likely to be better at monitoring and reducing financial statement fraud (Beasley, 1996) because more outside directors may be more likely to prevent management from making self-serving decisions (Fama, 1980). Beasley (1996) finds that firms that have not committed financial statement fraud have boards with more outside members than firms that have committed fraud. As outside directors' ownership in the firm increases, outside member tenure on the board increases and number of outside directorships in other firms decreases, the likelihood of financial statement fraud decreases. Additionally, Abrahamson and Park (1994) find that the presence of outside directors, large institutional shareholders (institutions that own 5% or more), and accountants (as seen in the presence of qualified audits) limits concealment of negative organizational outcomes, whereas small institutional owners (owning less than 5%) and outside-director-shareholders promote it.

The audit committee of a board has responsibility for interacting with the internal and external auditors and for assuring the quality of the financial reporting. McMullen (1996) finds that firms with earnings restatements, shareholder litigation,

Table 3. Interrater reliability measures

Variable	Agreement	Expected agreement	Kappa	S.E.	*Z*	Prob > *Z*
Accounting System	84.38%	15.82%	0.8144	0.0745	10.93	0.000
Policies and procedures	93.75%	19.34%	0.9225	0.0845	10.92	0.000
Code of conduct	96.88%	51.27%	0.9359	0.1015	9.22	0.000
Formal communication	96.88%	62.30%	0.9171	0.1109	8.27	0.000
Informal communication	90.63%	28.03%	0.8697	0.0984	8.84	0.000
Employee screening	100.00%	54.69%	1.0000	0.1203	8.31	0.000
Employee contingent pay	93.75%	27.54%	0.9137	0.0962	9.49	0.000
Audit committee	75.00%	19.04%	0.6912	0.0838	8.25	0.000
All variables together	91.41%	22.16%	0.8896	0.0297	29.91	0.000

SEC enforcement actions, illegal acts, or auditor turnover were less likely to have an audit committee than firms without these problems. DeFond and Jiambalvo (1991) find companies without audit committees were more likely to overstate earnings. Both of these studies imply that audit committees signal the likelihood for better financial reporting and fewer financial reporting problems.

CEOs can also be chair of the board. These are both powerful roles. If the roles of CEO and chair are separate, there may be more objective assessment of the performance of the CEO (Boyd, 1994). Vigilant boards may tend to favor separation of these roles because it reduces the possibility of entrenchment by the CEO. Entrenched CEOs may have so much power that they can use the firm to further their own interests, rather than the shareholders', and can hamper the board's independence and ability to monitor (Beatty and Zajac, 1994). This constraint reduces the possibility that the board can execute its governance role (Rechner and Dalton, 1991; Mizruchi, 1983).

Zajac and Westphal (1994) find that firms treat incentive alignment and monitoring as substitutes for each other, although Tosi, Katz, and Gomez-Mejia (1997) find that incentive alignment is a more powerful mechanism than monitoring for ensuring that agents act in the interests of owners. This alignment of agents' and principals' interests can be achieved through contingent compensation contracts (Jensen and Murphy, 1990). Table 4 summarizes these variables and their measures.

Other controls included are for firm size and past performance. Firm size may be an important predictor of illegal activity (Baucus and Near, 1991; Daboub *et al*., 1995). Larger firms are more likely to be investigated and not necessarily more likely to commit crimes. Also, larger firms can more easily absorb penalties for illegal acts and

Table 4. Summary of control variables and measures

Theoretical grouping	Variable	Measure
Structure of ownership	Largest owner	The largest 5%+ shareholder alone
	CEO stock ownership	Measured as the percentage of shares of the firm held by the CEO
	Stock held by the board	Measured as the percentage of stock held by the directors and officers of the company
Structure of the board of directors	Board insiders	Measured as the number of insiders divided by the total number of board members
	Board compensation	Measured as the yearly pay received by board members, assuming the member attended all regular meetings and was not on a committee
	Board compensation type	Scale 1–7, flat annual fee to highly contingent
	Number of meetings	The number of regular and special meetings in the past year of the board of directors
Audit committee	Number of meetings of the audit committee	The number of meetings in the past year of the audit committee
	Outsiders on the audit committee	The number of outsiders on the audit committee divided by the total number of audit committee members
	Strength of audit committee	Scale 1–7; higher numbers represent more independent committees, with more responsibility and authority
CEO	Number of roles	1 = CEO, 2 = CEO + Chair, 3 = CEO + Chair + President
	CEO flat compensation	Measured as the natural log of the CEO's salary and bonus
	CEO flat vs. contingent compensation	Measured as the salary, bonus, and other annual compensation divided by the dollar value of any options, stock or other long-term incentive pay
Other	Firm size	Number of employees
	Past performance	Past 3 years ROA
		Past 3 years change in market value

the stigma of illegal acts than can smaller firms (Hill *et al*., 1992).

Poor performance may increase the possibility of a crime. If crime improves the short-run performance of the employee's division or organization and poor performance in the short run increases the employees' probability of job loss, then the incentive to commit a crime is increased (Alexander and Cohen, 1996). The crime may be either to improve the perception of the division's performance or to appropriate assets for personal use prior to job loss. These variables are also in Table 4.

Estimation method

The first test is a binary logit model with crime as the dependent variable. In this case, crime = 0 in the cases of the firms without announced crime, and crime = 1 if there is any crime. As this is a matched-pair design, I employed a form of logit that allows for a stratified sample (data coming from two nonindependent groups). Additionally, to explore the idea that firms with more crime have weaker governance systems, the second test is an ordered logit model with the number of crimes committed as the dependent variable (0 to 6).[7] An ordered logit model allows multinomial dependent variables and is recommended when the dependent variables have some kind of natural ordering, in this case fewer crimes to more crimes.[8] The ordered logit model was also structured to allow for a stratified sample (data coming from two nonindependent groups).

One reason for the importance of the ordered logit model is that, throughout the sampling and testing, there has been an implicit assumption that firms that have not had an announcement of a crime have not had a crime. This is an unproven assumption. Accordingly, the ordered logit model will provide some idea of the progressive differences between firms with crime = 0, crime = 1, up to crime = 6. If there are progressive weakening governance systems, then the sampling technique, while not perfect, will be supported.

[7] I also ran models allowing crimes to be 0–2+ (or 0 crimes, 1 crime, 2 or more crimes) and 0–3+, as there are only two firms that had four or more announcements, and four that had three or more.

[8] Stata 7 reference manuals, Reference H-P, p. 451.

EMPIRICAL RESULTS

Descriptive statistics

For the control and governance variables, there is wide variation in many of the variables, indicating very different structures of firms. Table 5 shows the descriptive statistics. For example, the percentage of the firm held by the largest owner ranges from less than 5 percent of the firm to 90 percent, with the average at 13 percent. Similarly, the percentage of insiders on the board ranges from 7 percent to 100 percent, with the average at 33 percent. Some firms' boards met only once during the year, while others met 17 times, with the average at 7.5 meetings per year, with most boards meeting seven or eight times. In the area of CEO compensation, some CEOs receive no contingent compensation; some other CEOs receive 37.8 times their flat salary in contingent compensation (options, restricted stock). The average for all the firms in the sample is that CEOs receive 4.3 times their flat salary in contingent compensation. CEOs own 6 percent of the firm, on average, and boards own 12 percent, on average. These numbers range from essentially 0 percent to 90 percent and 95 percent, respectively.

Audit committees for the firms in the sample are mostly comprised of outsiders, but there are some audit committees with only insiders. Audit committees met three times a year, on average, with some committees meeting nine times, and others not at all.

With regard to the operational governance variables that were generated through the content analysis and range from 0 or 1 to 7, accounting systems, policies and procedures, and employee contingent pay average around 3.5 or 4, with standard deviations of 1.2 to 2. Formal communication, informal communication, code of conduct, and employee screening variables averaged 1.6 to 2.5, with standard deviations of 1.1 to 1.8.

Correlations

Table 6 shows the correlations. All the correlations discussed below are significant at the 0.05 level or greater. The crime variables are significantly correlated with a number of interesting governance and control variables. For example, of the control variables, more insiders on the board, CEO, block and board ownership are positively correlated with crime occurrence. Board compensation

Table 5. Descriptive statistics

Variable	Obs.	Mean	S.D.	Min.	Max.
1. Crime	154	0.50	0.50	0	1
2. # of Crimes	154	0.95	1.41	0	6
3. Accounting System	154	4.10	2.04	0	7
4. Policies & Procedures	154	3.53	1.75	0	7
5. Code of Conduct	154	2.40	1.76	1	7
6. Formal Communication	154	1.95	1.60	1	7
7. Informal Communication	154	2.47	1.67	1	7
8. Employee Screening	154	1.61	1.16	1	7
9. Employee Contingent Pay	154	3.40	1.15	0	6
10. % Largest Owner	154	0.13	0.15	0	0.9
11. % Owned by CEO	154	0.06	0.14	0	0.9
12. % Owned by the Board	154	0.12	0.18	0	0.95
13. % Insiders	154	0.33	0.16	0.07	1
14. Ln(Board Salary)	154	10.62	1.32	0	13.59
15. Board Salary Type	154	4.07	1.49	0	7
16. # Meetings of the Board	154	7.47	2.78	1	17
17. # Meetings Audit Committee	154	2.95	1.45	0	9
18. % Outsiders on Audit Committee	154	0.90	0.20	0	1
19. Audit Committee Strength	154	4.39	1.38	0	7
20. # Roles CEO	154	2.30	0.57	1	3
21. Ln(CEO Flat Pay)	154	13.75	1.41	0	15.99
22. CEO Contingent/Flat	154	4.31	6.41	0	37.82
23. Size (Employees)	132	79.21	112.60	0	520
24. ROA Past 3 years	132	0.06	0.06	−0.16	0.22
25. Change in Market Value Past 3 years	132	1.60	4.91	−0.74	44.88

measured as both level of pay and as extent of stock- and option-based pay and audit committee strength are negatively correlated with the crime variables. These variables are not correlated with the number of crimes committed. Only the number of meetings of the board, the number of roles of the CEO, and the CEO's flat compensation are positively correlated with the number of crimes committed. Size is positively correlated with the number of crimes, but not the initial occurrence, and past performance measured as ROA is negatively correlated with the number of crimes, but not the initial occurrence. Past performance measured as the change in market value of the firm is not correlated with either of the crime variables.

The accounting system, policies and procedures, formal and informal communication, code of conduct, and contingent pay for employees are all negatively correlated with the occurrence of a crime. Policies and procedures, formal and informal communication are also negatively correlated with the number of crimes committed.

From the correlations, it appears that certain governance components 'go together,' and that they may be able to impact crime occurrence. It can be seen from the descriptive statistics that there are wide distributions of these variables, so that crime and noncrime companies look very different, and that these differences appear to be related to occurrences of crime.

Operational governance hypothesis testing

Logistic regressions

Table 7 shows the results of the logistic regressions on crime and number of crimes, clustering the pairs of firms together by announcement. Table 7 also shows logistic regressions when the number of crimes runs from 0 to 3+ and 0 to 2+. In other words, when the categories are 'no crime,' 'one crime,' 'two crimes' and 'three or more crimes,' or 'none,' 'one' and 'two or more crimes.' This preserves our ability to see if firms with multiple crimes are different, while increasing the representation in each of the 'more crimes' categories. For example, there is only one firm that committed six crimes, so the logistic regression on number of crimes only has one company in level 'six.'

Table 8 shows the results of the regressions clustering by firms. In other words, the firm that

Table 6. Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Crime	1											
2. # of Crimes	0.6809**	1										
3. Accounting System	−0.2811**	0.0495	1									
4. Policies & Procedures	−0.5499**	−0.3877**	0.4670**	1								
5. Code of Conduct	−0.2075**	0.0127	0.6572**	0.4643**	1							
6. Formal Communication	−0.4154**	−0.2973**	0.0838	0.4503**	0.0702	1						
7. Informal Communication	−0.4254**	−0.3359**	0.1237	0.4982**	0.2173**	0.5452**	1					
8. Employee Screening	−0.1352	−0.1235	0.1586*	0.2255**	0.0198	0.1347	0.0489	1				
9. Employee Contingent Pay	−0.3296**	−0.0494	0.3427**	0.2764**	0.3049**	0.0721	0.2685**	0.1092	1			
10. % Largest Owner	0.1770*	0.0511	−0.1878*	−0.0923	−0.1655*	−0.0936	−0.0915	0.0348	0.0208	1		
11. % Owned by CEO	0.2099**	−0.0400	−0.3476**	−0.2001*	−0.2452**	−0.1216	−0.1340	−0.0015	−0.0911	0.5406**	1	
12. % Owned by the Board	0.2046*	−0.0522	−0.2763**	−0.1388	−0.2630**	−0.1051	−0.1067	0.0198	−0.0191	0.7809**	0.7460**	1
13. % Insiders	0.1613*	−0.0599	−0.2574**	−0.1555	−0.2424**	−0.1279	−0.0495	−0.0826	−0.0475	0.2638**	0.2699**	0.4061**
14. Ln(Board Salary)	−0.1739*	−0.0386	0.1679*	0.2059*	0.1303	0.0170	0.1571	0.0334	0.2411**	−0.1932*	−0.3590**	−0.2749**
15. Board Salary Type	−0.3286**	−0.0578	0.2993**	0.3238**	0.3264**	0.0868	0.2654**	−0.0483	0.2783**	−0.1972*	−0.3477**	−0.4136**
16. # Meetings of the Board	0.0843	0.1942*	0.1596*	−0.0594	0.2058*	−0.1237	−0.1057	−0.1360	−0.0512	−0.3386**	−0.2552**	−0.3568**
17. # Meetings Audit Committee	−0.0180	0.1081	0.2125**	0.0032	0.1626*	−0.0605	0.0374	0.0074	0.0245	−0.0894	−0.1791*	−0.1293
18. % Outsiders on Audit Committee	−0.1178	−0.0751	0.2344**	0.1075	0.2065*	0.0117	0.0520	0.1084	0.2092**	−0.1230	−0.1452	−0.1964*
19. Audit Committee Strength	−0.3203**	−0.0816	0.5093**	0.4772**	0.4028**	0.3371**	0.3413**	0.1037	0.2509**	−0.2469**	−0.2685**	−0.3424**
20. # Roles CEO	0.0455	0.1629*	−0.0882	−0.0683	−0.1331	0.0598	0.0013	0.2260**	−0.0151	−0.0358	0.0598	−0.1059
21. Ln(CEO Flat Pay)	0.0821	0.1857*	0.1846*	0.0485	0.1792*	0.0575	0.1383	0.0250	0.0534	−0.1247	−0.2246**	−0.1928*
22. CEO Contingent/Flat	−0.0035	0.0203	0.2630**	0.1021	0.2186**	−0.0876	0.0604	−0.0453	0.0010	−0.1918*	−0.2126**	−0.2088**
23. Size (Employees)	0.1260	0.4714**	0.3730**	0.1357	0.5029**	0.0427	0.0153	−0.1981*	0.2483**	−0.0532	−0.2360*	−0.1915*
24. ROA Past 3 Years	−0.1352	−0.2262**	0.0518	0.0726	0.0684	−0.0058	0.1033	0.0758	0.1290	−0.0821	0.0393	0.0655
25. Change in Market Value Past 3 Years	0.0793	−0.0083	−0.2072*	−0.1465	−0.1129	−0.1179	−0.0650	0.1811*	−0.0421	0.1107	−0.0236	0.0899

* $p < 0.05$; ** $p < 0.01$.

Table 6. (*Continued*)

Variable	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Crime													
2. # of Crimes													
3. Accounting System													
4. Policies & Procedures													
5. Code of Conduct													
6. Formal Communication													
7. Informal Communication													
8. Employee Screening													
9. Employee Contingent Pay													
10. % Largest Owner													
11. % Owned by CEO													
12. % Owned by the Board													
13. % Insiders	1												
14. Ln(Board Salary)	−0.1462	1											
15. Board Salary Type	−0.4238**	0.5185**	1										
16. # Meetings of the Board	−0.2985**	0.1320	0.1278	1									
17. # Meetings Audit Committee	−0.1407	0.1011	0.0474	0.3946**	1								
18. % Outsiders on Audit Committee	−0.3941**	0.2395**	0.3393**	0.1828*	0.1596*	1							
19. Audit Committee Strength	−0.3212**	0.1941*	0.4823**	0.1188	0.0985	0.2883**	1						
20. # Roles CEO	−0.2768**	−0.0415	0.0208	0.0389	0.0820	0.0596	0.0254	1					
21. Ln(CEO Flat Pay)	−0.1806*	0.1184	0.1909*	0.0649	0.1263	0.1341	0.2100**	−0.0823	1				
22. CEO Contingent/Flat	−0.2026*	0.2091**	0.2529**	0.1737*	0.0855	0.0517	0.1855*	0.0508	0.1644*	1			
23. Size (Employees)	−0.2062*	−0.0416	0.2002*	0.2919**	0.1494	0.1812*	0.2390**	−0.0392	0.1769*	0.1849*	1		
24. ROA Past 3 Years	0.1974*	−0.0317	−0.1542	−0.0882	0.0683	−0.0217	−0.0654	−0.0361	−0.0668	0.0515	−0.0821	1	
25. Change in Market Value Past 3 Years	0.1092	0.0374	−0.0815	−0.1868*	−0.0896	0.0474	−0.0719	0.1530	−0.0287	−0.1054	−0.1305	−0.1175	1

* $p < 0.05$; ** $p < 0.01$.

Table 7. Logistic regressions on crime independent variables, clustering by announcement

Variables	Crime Model 1	Crime Model 2	# of crimes Model 1	# of crimes Model 2	Crimes 0–3+ Model 1	Crimes 0–3+ Model 2	Crimes 0–2+ Model 1	Crimes 0–2+ Model 2
Controls								
% largest owner	3.76	4.95	4.21	6.49	3.85	5.95	2.75	4.02
	(2.50)	(5.32)	(2.47)	(3.98)	(2.24)	(3.68)	(2.04)	(3.33)
CEO Triality	0.54	1.11	0.57	0.50	0.39	0.31	0.39	0.67
	(0.45)	(0.72)	(0.42)	(0.44)	(0.41)	(0.43)	(0.40)	(0.46)
% Insiders	1.75	1.02	1.16	−0.67	1.24	−0.37	1.56	−0.21
	(2.03)	(2.70)	(1.43)	(1.54)	(1.39)	(1.46)	(1.51)	(1.61)
Board Salary Type	−0.48*	−0.55	−0.37*	−0.60*	−0.40*	−0.69*	−0.41*	−0.66*
	(0.21)	(0.28)	(0.18)	(0.28)	(0.18)	(0.28)	(0.19)	(0.28)
Ln(Board Salary)	−0.01	0.24	−0.06	0.20	−0.07	0.21	−0.11	0.22
	(0.31)	(0.37)	(0.23)	(0.32)	(0.22)	(0.30)	(0.24)	(0.30)
# Meetings of the Board	0.29*	0.18	0.20	0.15	0.20	0.15	0.30	0.22
	(0.13)	(0.13)	(0.13)	(0.11)	(0.12)	(0.11)	(0.15)	(0.13)
CEO Contingent/Flat Pay	0.02	−0.02	0.01	−0.02	0.02	−0.02	0.03	−0.01
	(0.04)	(0.07)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.06)
Ln(CEO Flat Pay)	0.71*	1.03	0.79*	0.81	0.78*	0.76	0.63*	0.56
	(0.30)	(0.79)	(0.32)	(0.46)	(0.31)	(0.43)	(0.29)	(0.41)
% owned by CEO	3.21	−4.66	0.48	−1.96	0.33	−2.10	0.67	−3.93
	(3.72)	(6.26)	(1.74)	(1.90)	(1.79)	(2.01)	(2.13)	(2.44)
% Owned by the Board	0.53	5.15	−2.12	−4.59	−2.08	−4.62	−0.19	−0.75
	(2.40)	(5.43)	(2.33)	(4.19)	(2.19)	(3.98)	(2.16)	(3.88)
% Outsiders on Audit Committee	0.29	−2.18	−1.06	−4.72**	−1.54	−5.45**	−1.01	−4.54**
	(1.45)	(1.91)	(1.06)	(1.34)	(1.12)	(1.44)	(1.13)	(1.47)
# Meetings Audit Committee	−0.23	−0.41	−0.16	−0.71*	−0.15	−0.62*	−0.23	−0.61*
	(0.20)	(0.30)	(0.16)	(0.30)	(0.16)	(0.28)	(0.19)	(0.26)
Audit Committee Strength	−0.49*	0.49	−0.44*	0.63*	−0.46**	0.57	−0.51*	0.55
	(0.23)	(0.38)	(0.18)	(0.31)	(0.18)	(0.29)	(0.22)	(0.31)
Size (Employees)	0.00*	0.01*	0.01**	0.02**	0.01**	0.02**	0.01**	0.03**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
ROA Past 3 Years	−7.17	−5.35	−7.71**	−5.33	−7.26**	−4.39	−6.01*	−2.99
	(4.56)	(4.22)	(3.00)	(4.47)	(2.92)	(4.19)	(3.04)	(3.71)
Change in Market Value Past 3 Years	0.03	−0.09	0.01	−0.07*	0.02	−0.06	0.04	−0.05
	(0.04)	(0.06)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)
Governance variables								
Accounting System		−0.19		0.20		0.18		0.10
		(0.18)		(0.17)		(0.16)		(0.14)
Policies & Procedures		−0.74*		−0.82**		−0.73**		−0.67**
		(0.37)		(0.23)		(0.21)		(0.24)
Code of Conduct		−0.37		−0.92**		−0.90**		−0.85*
		(0.44)		(0.36)		(0.36)		(0.38)
Formal Communication		−1.07		−1.33**		−1.33**		−1.35**
		(0.61)		(0.39)		(0.39)		(0.41)
Informal Communication		−0.09		−0.41		−0.40*		−0.39*
		(0.25)		(0.21)		(0.20)		(0.18)
Employee Screening		0.19		0.75**		0.70**		0.60**
		(0.32)		(0.24)		(0.21)		(0.23)
Employee Contingent Pay		−0.85**		−0.48		−0.58*		−0.71**
		(0.30)		(0.25)		(0.25)		(0.27)
Pseudo R^2	0.29	0.61	0.18	0.46	0.19	0.48	0.24	0.54
Chi square	41.68**	112.8**	46.49**	132.8**	43.84**	107.33**	45.1**	65.32**

The entries in the table are coefficients, with standard errors in parentheses. * $p < 0.05$; ** $p < 0.01$

Table 8. Logistic regressions on crime-independent variables, clustering by company

Variables	Crime Model 1	Crime Model 2	# of crimes Model 1	# of crimes Model 2	Crimes 0–3+ Model 1	Crimes 0–3+ Model 2	Crimes 0–2+ Model 1	Crimes 0–2+ Model 2
Controls								
% largest owner	3.76	4.95	4.21	6.49	3.85	5.95	2.75	4.02
	(2.66)	(5.38)	(2.75)	(3.97)	(2.46)	(3.68)	(2.15)	(3.29)
CEO Triality	0.54	1.11	0.57	0.50	0.39	0.31	0.38	0.67
	(0.53)	(0.73)	(0.62)	(0.55)	(0.58)	(0.53)	(0.51)	(0.51)
% Insiders	1.75	1.02	1.16	−0.67	1.24	−0.37	1.56	−0.21
	(2.16)	(2.76)	(1.47)	(1.62)	(1.45)	(1.52)	(1.59)	(1.64)
Board Salary Type	−0.48	−0.55	−0.37	−0.60*	−0.40	−0.69*	−0.41	−0.66*
	(0.26)	(0.29)	(0.27)	(0.30)	(0.29)	(0.31)	(0.27)	(0.29)
Ln(Board Salary)	−0.01	0.24	−0.06	0.20	−0.07	0.21	−0.11	0.22
	(0.33)	(0.38)	(0.28)	(0.34)	(0.26)	(0.31)	(0.27)	(0.31)
# Meetings of the Board	0.29*	0.18	0.19	0.15	0.20	0.15	0.30	0.22
	(0.14)	(0.13)	(0.14)	(0.12)	(0.14)	(0.12)	(0.16)	(0.14)
CEO Contingent/Flat Pay	0.02	−0.02	0.01	−0.02	0.02	−0.02	0.03	−0.01
	(0.04)	(0.07)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.06)
Ln(CEO Flat Pay)	0.71*	1.03	0.79*	0.81	0.78*	0.76	0.63	0.56
	(0.34)	(0.80)	(0.35)	(0.60)	(0.34)	(0.57)	(0.34)	(0.46)
% owned by CEO	3.21	−4.66	0.48	−1.96	0.33	−2.10	−0.67	−3.93
	(3.93)	(6.36)	(1.85)	(1.97)	(1.90)	(2.10)	(2.29)	(2.44)
% Owned by the Board	0.53	5.15	−2.12	−4.59	−2.08	−4.62	−0.19	−0.75
	(2.59)	(5.47)	(2.70)	(4.29)	(2.56)	(4.08)	(2.50)	(3.86)
% Outsiders on Audit Committee	0.29	−2.18	−1.06	−4.72**	−1.54	−5.45**	−1.01	−4.54**
	(1.77)	(1.92)	(1.39)	(1.31)	(1.56)	(1.42)	(1.45)	(1.37)
# Meetings Audit Committee	−0.23	−0.41	−0.16	−0.71*	−0.15	−0.62	−0.23	−0.61*
	(0.20)	(0.30)	(0.18)	(0.34)	(0.18)	(0.32)	(0.20)	(0.28)
Audit Committee Strength	−0.49	0.49	−0.44	0.63	−0.46	0.57	−0.51	0.55
	(0.28)	(0.38)	(0.24)	(0.32)	(0.24)	(0.31)	(0.28)	(0.32)
Size (Employees)	0.00	0.01*	0.01*	0.02**	0.01	0.02**	0.01*	0.03**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
ROA Past 3 Years	−7.17	−5.35	−7.71*	−5.33	−7.26*	−4.39	−6.01	−2.99
	(4.80)	(4.32)	(3.50)	(4.78)	(3.29)	(4.43)	(3.27)	(3.81)
Change in Market Value Past 3 Years	0.03	−0.09	0.01	−0.07	0.02	−0.06	0.04	−0.05
	(0.04)	(0.06)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)
Governance variables								
Accounting System		−0.19		0.20		0.18		0.10
		(0.19)		(0.18)		(0.17)		(0.15)
Policies & Procedures		−0.74*		−0.82**		−0.73**		−0.67**
		(0.37)		(0.24)		(0.22)		(0.24)
Code of Conduct		−0.37		−0.92*		−0.90*		−0.85*
		(0.43)		(0.36)		(0.36)		(0.38)
Formal Communication		−1.07		−1.33**		−1.33**		−1.35**
		(0.62)		(0.40)		(0.41)		(0.43)
Informal Communication		−0.09		−0.41		−0.40*		−0.39*
		(0.26)		(0.21)		(0.20)		(0.19)
Employee Screening		0.19		0.75**		0.70**		0.60*
		(0.33)		(0.26)		(0.23)		(0.25)
Employee Contingent Pay		−0.85**		−0.48		−0.58*		−0.71*
		(0.32)		(0.29)		(0.29)		(0.30)
Pseudo R^2	0.29	0.61	0.18	0.46	0.19	0.48	0.24	0.54
Chi square	35.17**	109.64**	35.73**	157.14**	34.99**	113.06**	34.94**	66.37**

The entries in the table are coefficients, with standard errors in parentheses. $^{*}p < 0.05$; $^{**}p < 0.01$

had six announcements is in the sample six times, as is its match. In Table 8, the clustering method accounts for the nonindependence across the pairs as well as within the pairs of these observations.

I run two models for each dependent variable to capture the difference between traditional governance variables and operational governance variables. Model 1 for each of the models consists of the control variables, while Model 2 adds in the operational governance variables.

The data do not support Hypothesis 1, that the strength of the accounting system reduces the incidence of crime, in either the binary or ordinal estimation. In contrast, there is strong support for Hypothesis 2—that clear policies and procedures reduce the likelihood of crime. Hypothesis 3, that a stronger and more complex code of conduct reduces the likelihood of crime, is partially supported. It is not significant in the binary regression, but it is negative and significant in the ordinal models. Formal communication, Hypothesis 4, is also partially supported. As is the case with the code of conduct, formal communication is not significant in the binary model, but is in the ordinal models. Informal communication, Hypothesis 5, is weakly supported, as there is no support in the binary model or the full number of crimes models, but informal communication is negative and significant in the two reduced number of crimes models. Employee screening actually appears to increase the likelihood of crime in the ordinal models, the opposite of Hypothesis 6, and receives no support in the binary model. Employee contingent pay appears to reduce the occurrence of a crime, but not the number of crimes in the full crime model. However, employee contingent pay is negative and significant in both reduced number of crimes models, somewhat supporting Hypothesis 7.

With regard to the control variables, block ownership, the number of roles of the CEO, the percentage of insiders on the board, the level of pay of the board, the amount of contingent pay the CEO receives (options, restricted stock), CEO or board ownership levels have no impact on the likelihood of crime, in any of the binary or ordinal models, in either the control or the full versions of the models, and regardless of method or grouping the data.

The number of meetings of the board is only significant in the binary crime model, and only when run with the other controls, and becomes insignificant in the full model, as well as in all forms of the ordinal regressions. The level of the CEO's flat pay is positive and significant in the control versions of the models only, with the exception of the ordinal control regression in Table 8 on crime scaled as 0–2+. When the operational governance variables are added, this result disappears.

The percent of outsiders on the audit committee and number of meetings of the audit committee have similar results. Neither is significant in any version of the binary regression. Both become negative and significant in the ordinal models, but only in the full versions of the models, not the control versions of the models. The exception is in the regression on crime as a range of 0–3+ in Table 8, where the number of meetings of the audit committee becomes insignificant. A greater percentage of outsiders on the audit committee and more meetings of this committee do not appear to impact the likelihood of a first crime; rather they may help prevent subsequent crimes. Audit committee strength is significant only in Table 7, and only for the control versions of the models, not for any of the full versions of the models.

Board salary type (a higher number means more contingent components) is negative and significant in all ordinal models in Table 7, as well as the binary control model. It is negative and significant in the full versions of the ordinal models in Table 8, but not the control versions of the models or either of the binary models. The more the board is paid through contingent methods, the less likely there is to be crime.

Size is positive and significant in all models in Table 7, and most of the models in Table 8. The change in market value over the past 3 years is negative and significant only in the full version of the ordinal model on number of crimes. Performance measured as ROA over the past 3 years is negative and significant in all the ordinal models in Table 7, but only in the control versions of the models, not the full models. It is only negative and significant in two of the three ordinal models in Table 8, again in the control versions of these models, not the full versions.

Marginal effects

In order to assess the relative impact of these variables on the occurrence of crime, I generated the marginal effect of each variable in the control version of the model and then the full model on the binary crime variable. Table 9 shows these results.

Table 9. Marginal effects of independent variables on crime as a binary dependent variable

Variable	Model 1: Control model	A move from the mean to:	Changes the pr(crime) by y%	Model 2: Full model	A move from the mean to:	Changes the pr(crime) by y%	Variable means
% Largest Owner	0.94	0.23	0.09	1.21	0.23	0.12	0.13
# Roles CEO	0.13	1	−0.17	0.27	1	−0.35	2.3
% Insiders	0.44	0.43	0.04	0.25	0.43	0.03	0.33
Board Salary Type	−0.12	5	−0.11	−0.13	5	−0.12	4.07
Ln(Board Salary)	−0.03	11.62	0.98	0.06	11.62	1.06	10.62
Dollar Translations of Logs		111,302			111,302		40,946
# Meetings of the Board	0.07	9	0.11	0.04	9	0.06	7.47
CEO Contingent/Flat	0.01	5	0.01	−0.01	5	−0.001	4.31
Ln(CEO Flat Pay)	0.18	14.75	1.20	0.25	14.75	1.28	13.75
Dollar Translations of Logs		2,545,913			2,545,913		936,589
% Owned by CEO	0.8	0.16	0.08	−1.14	0.16	−0.11	0.06
% Owned by the Board	0.13	0.22	0.013	1.26	0.22	0.126	0.12
% Outsiders on Audit Committee	0.07	0.8	−0.007	−0.53	0.8	0.05	0.90
# meetings Audit Committee	−0.06	4	−0.06	−0.1	4	−0.11	2.95
Audit Committee Strength	−0.12	6	−0.19	0.12	6	0.19	4.36
Size (Employees)	0.00	0.00	0.00	0.00	0.00	0.00	79.21
ROA past 3 years	−1.79	0.16	−0.18	−1.31	0.16	−0.131	0.06
Change in Market Value Past 3 Years	0.01	2.6	0.01	−0.02	2.6	−0.02	1.60
Accounting System				−0.05	5	−0.05	4.14
Policies & Procedures				−0.18	5	−0.26	3.52
Code of Conduct				−0.10	4	−0.16	2.38
Formal Communication				−0.26	3	−0.27	1.95
Informal Communication				−0.02	4	−0.03	2.51
Employee Screening				0.05	3	0.07	1.61
Employee Contingent Pay				−0.21	5	−0.34	3.39

*Model coefficients reflect a % change in the Pr(crime) for a 1-unit change in the independent variable away from its mean. Subsequent columns translate that into units and percentages.

Marginal effects can be interpreted as the change in the probability of crime for each unit change in the independent variables. These effects were computed based on the independent variable's mean value. In the control version of the model, increasing the share ownership of the largest owner, insider representation on the board, board salary level, number of meetings of the board, CEO compensation, both level and contingent components, CEO and board ownership increase the probability of crime. Decreasing the number of roles of the CEO, paying the board more with contingent pay, increasing outsider representation on the audit committee, the number of meetings of the

audit committee and the audit committee strength decrease the probability of crime. Higher historical ROAs decrease the probability of crime while greater positive historical changes in market value increase the probability of crime.

In the full version of the model, many of the results are similar, or show magnitude but not direction changes. Direction changes are seen in the level of CEO compensation, CEO share ownership and historical market value variables from positive to negative. Outsider representation on the audit committee and audit committee strength also change sign from negative to positive.

For the operational governance variables, the percentage changes in crime based on a move from the variable mean to the next significant level up were calculated, as these are scale variables and noninteger numbers have no meaning. An increase in all of these except employee screening reduces the probability of crime.

DISCUSSION

Previous organizational research has not addressed crime extensively, and the few studies that have done so have generally focused on board-level variables rather than the organizational conditions that encourage or prevent crime. The researchers who have studied different operational governance mechanisms have generally done so one at a time. This study integrated this previous research of board-level variables with the multiple streams included in operational governance research to develop a set of mechanisms that have the possibility to impact occurrence of crimes in companies.

In this study, operational governance mechanisms appear to dominate more traditional governance mechanisms in the prevention of white-collar crime. Clarity of policies and procedures was persistent in its significance, while formal communication, the code of conduct, and employee contingent pay were significant in most models.

Clarity of policies and procedures may be significant because the clearer it is to employees what their job actually is, and what to refer to others, the less likely they are to cut corners. By moving from a mean of 3.53 to 5 on policies and procedures, a firm can reduce the probability of white-collar crime by 26 percent. By finding the interpretation of these numbers in Appendix 2, it can be seen that this means that moving from a discussion of systems (variable = 3), or clear policies in one division (variable = 4) to communicating policies throughout the firm and an emphasis on training accordingly (variable = 5) will reduce the probability of crime by 26 percent.

Similarly, moving from a score of 2 to a score of 3 in formal communication represents moving from large group activities rarely done in the same location to having smaller groups who meet by necessity somewhat often. This shift can reduce the probability of crime by 27 percent. This may be significant because the more individuals in the company know about what others are doing, the less likely they are to commit a crime.

Stronger and more comprehensive codes of conduct may reduce numbers of crimes, or the possibility of a second crime occurring, by making clear what constitutes appropriate behavior. By moving from a 2.4 to a 4 on code of conduct moves the probability of crime down 16 percent. This means moving from a focus on compliance in the code to an acceptance of corporate social responsibility and citizenship and clarity that top management know the code of conduct.

Finally, as more employees receive performance-based rewards for their effort, the less likely they are to commit a crime. Essentially, by making performance bonuses or profit sharing available to all employees reduces the probability of crime by 34 percent. This could indicate less inclination on the part of the employee to 'steal from themselves' by reducing the profit of a division through crime. It could also indicate a greater likelihood of a colleague to report a fellow employee for a crime. Finally, it could also indicate a greater sense of 'ownership' on the part of the employee, and could create a feeling of being appreciated, thus reducing the likelihood of crime.

The employee contingent pay variable is focused on 'all employees,' not the CEO or top management team alone. This finding does not support more options compensation for top management teams, as can be seen in the lack of significance of the variable that captures the impact of options paid to the CEO. Indeed, the marginal effect of increasing options for the CEO increases the probability of crime in the control model, and has a trivial negative marginal effect in the full model.

Employee screening is positive and significant in the ordinal models. This may indicate that as the emphasis on 'hiring the best talent' increases, competition among individuals, new hires as well

as old ones, may increase. As this happens, the tendency to cut corners may increase, especially after one crime has been committed. It may be that this variable measures the competitive nature of the firm's culture and not the attention paid to hiring qualified, honest individuals. The marginal effect of this variable is positive and reflects that when a firm moves from care in hiring financial and audit staff to a focus on recruiting depth, the probability of crime increases 7 percent.

The accounting system's marginal effect is such that moving from implementation of new control procedures based on recommendations to a more proactive system that does systematic review and modification will reduce the probability of crime by 5 percent.

Of the control variables, a number of these change signs or significance levels when run as just controls compared to the full models. For example, board salary type is negative and significant across the ordinal full models in Table 8, but not the control versions of those models or either binary model. This indicates that the more the board is paid in stock and options, the less likely the firm is to have multiple crimes. If the board does not own a significant percentage of the firm, then contingent compensation aligns the board members' incentives with the goals of the firm. This finding cannot be interpreted as the more the board gets paid, the more seriously they take their job, as the level of board salary is not significant. This is the strongest result involving the control variables. The marginal effect of board salary type is that as soon as the board is paid in options, the probability of crime is reduced 12 percent.

The magnitude of the CEO's salary is only positive and significant in the control versions of the models, and not in the full versions. This is cautionary in that if laws were changed based on current assumptions about CEO compensation, they would be misdirected. Similarly, the number of meetings of the board is positive and significant only in the control versions of the binary models.

While none of the ownership variables are significant in the logit models, there are some interesting marginal effects results. More ownership by the largest owner increases the probability of crime. For example, a move from the largest owner owning 13 percent to owning 23 percent increases the probability of crime by 12 percent. More ownership by the CEO (from 6% to 16%) decreases the probability of crime by 11 percent, while a similar increase in board ownership increases the probability of crime 13 percent.

As the CEO sheds roles, or serves only as CEO, and not as CEO and chair of the board, the probability of crime declines by 35 percent. This clearly supports the previous research that finds that too much power in the CEO's hands leads to less objective assessment and greater entrenchment (Boyd, 1994; Beatty and Zajac, 1994).

Audit committee strength is negative and significant in the control versions of the models in Table 7, but insignificant in the full versions of the models, as well as insignificant in all versions in Table 8. However, a greater percentage of outsiders on the audit committee and more audit committee meetings appear to reduce the likelihood of multiple crimes. This might be because a corporate reaction to a first crime is to focus on the audit committee. These results are interesting when taken in tandem with the finding on audit committee strength. This collection of variables seems to indicate that if an audit committee is mostly outsiders and meets frequently, then a charter or 'job description' is excessive. Interestingly, the marginal effect of audit committee strength in the full model is that a move from a 4 to a 5 increases the probability of crime by 19 percent. Decreasing outsider representation (from 90% to 80%) increases crime 5 percent and moving from 3 to 4 audit committee meetings reduces crime by 11 percent. This is an important finding especially if investors look to audit committees to monitor the financial integrity of the firm. This result indicates that some of the policy-making is misplaced, especially that which deals with committee charters.[9]

Past performance is only significant in the control model on number of crimes. This significance goes away in the full model. The change in market value is only negative and significant in the full model on the number of crimes in Table 7. Economic conditions of the firm do not appear to encourage or discourage crime. This may be because there are either pressures at extremes of performance, both good and bad, or that there are pressures all the time to commit crime. Because the sample is matched firms, and prior performance does not have an impact, there is something about

[9] The New York Stock Exchange adopted changes in listing standards for NYSE-listed firms, including a policy requiring key committee charters. August 16, 2002, www.nyse.com.

the firm itself, not its environment that creates the increased probability of a crime to be committed. The discussion about whether poor performance drives crime or good performance drives crime is secondary to the necessary discussion about what exactly is it internal to the firm that drives crime.

There are two key sets of findings. First, the findings show that there are mechanisms that managers can use to reduce the possibility of white-collar crime occurrence. Clear policies and procedures and designated liaison roles along with a strong, comprehensive code of conduct and more contingent pay for more employees are associated with fewer occurrences of crime. Contingent pay for board members is also associated with a reduction in the number of crime occurrences.

Second, given the differences in results between control and full models, traditional governance researchers should be careful about the use of their variables. Pseudo R^2s increased significantly between the control and full models. While the number of meetings of the board and the level of the CEO's salary are the only variables that are significant in both control versions of the models and not in either of the full versions, the fact that they do become insignificant indicates an omitted variable bias. It seems clear that governance research must reach down inside the firm to be able to speak to fraud reduction.

Limitations

One limitation of this study is that the sample is dependent on having a crime allegation be announced. Most corporations prefer to hide crimes. Many more crimes are committed but not announced than announced. The most serious implication for this is the question: Are the noncrime firms really crime-free? For example, has one firm announced a crime because it has a better detection system, and so more crimes are likely to be discovered in that firm, but that firm does not have more crimes *per se* than its matched firm, which has a poorer detection system, and so may have *more* crimes. This issue is less powerful as long as the relationship is that firms with more crimes, and more serious crimes, are the 'crime firms,' and the 'noncrime firms' have fewer, or less serious crimes. This is addressed in part through the use of the ordered logit model. As discussed, the results indicate firms with more crimes have less clear policies and procedures, weaker formal communication, and less employee contingent pay than firms with fewer crimes. This result is consistent with the results of the binary logit model.

A second limitation is a result of the limitations of content analysis. If a firm did not mention anything with respect to the variables being measured in the annual report, 10K or proxy statement, the company was not credited with that activity. For example, a firm could have a code of conduct, but if it did not mention it in the SEC documents, it was scored as not having one. While this overlooked some firms' activities, it can also be said that if they do not choose to mention it in these documents, the firms do not think it is all that important. These are required documents, so every public firm produces them. As a result, there is no availability bias. As long as what the company reports or describes in these documents is consistent with the activities of the firm, then the results will hold.

A limitation, not with the study, but with the interpretation of some of the marginal effects numbers, is that the scoring system for the content-context numbers is not linear. In other words, while '3' means more than '2' and '4' means more than '3', the difference from 2 to 3 in activities in the firm may be different from the distance from 3 to 4. The strongest statement the marginal effects provides is a relative magnitude difference in the impact on reduction of crime in the firm. Start with the activities that have the highest marginal effects.

CONCLUSION

This paper contributes to both the corporate crime literature and the strategy literature. It also contributes to practice in that this study generates a set of operational governance components that have the potential to reduce crime and its associated costs to the firm.

The contributions to the strategy literature include definitional and measurement contributions. I created a broader and deeper definition of operational governance that incorporates previous research in the traditional governance area. The resulting mechanisms are measurable, so future research can include precise descriptions of governance mechanisms that will enable deeper understanding through comparisons and large sample studies.

The findings that some of the operational governance mechanisms are more powerful in explaining crime than traditional governance mechanisms is also a contribution, and has a role in the debate over reforms to the current system. If outsider ('independent') board members, for example, have no impact on crime, then placing the responsibility for past or future crimes in their hands is not appropriate and will not have the intended effect.

In the arena of managerial practice, an ability to reduce the damaging impact of a crime is significant. If a firm reduces internal frauds only a little, losing 3 percent of sales vs. 6 percent (the average estimate: Hogsett and Radig, 1994; Touby, 1994; ACFE, 2002) this represents a significant increase in profit margin. Employing the operational mechanisms discovered in the study to reduce crime can have a significant impact on firm performance.

This study can also guide investors who are concerned about the quality of the firm in which they are investing. An assessment across the key variables can give an indication of the likelihood of that firm to be prone to crime.

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REFERENCES

Abrahamson E, Park C. 1994. Concealment of negative organizational outcomes: an agency theory perspective. *Academy of Management Journal* **37**(5): 1302–1334.

Agro D. 1978. White collar crime: we cannot afford it! *Government Accountants Journal* **28**(Spring): 53–57.

Albrecht WS, Wernz GW, Williams T. 1995. *Fraud: Bringing Light to the Dark Side of Business*. Irwin: New York.

Alexander C, Cohen MA. 1996. New evidence of the origins of corporate crime. *Managerial and Decision Economics* **17**(4): 421–435.

Alexander C, Cohen MA. 1999. Why do corporations become criminals? Ownership, hidden actions and crime as an agency cost. *Journal of Corporate Finance* **5**(1): 1–34.

Almaney A. 1974. Communication and the systems theory of organization. *Journal of Business Communication* **12**(1): 35–43.

Anonymous. 1994. Ethics policies help reduce internal control costs. *Journal of Accountancy* **177**(4): 14.

Anthony RN. 1988. *The Management Control Function*. Harvard Business School Press: Boston, MA.

Arndt M, Bigelow B. 2000. Presenting structural innovation in an institutional environment: hospitals' use of impression management. *Administrative Science Quarterly* **45**: 494–522.

Association of Certified Fraud Examiners. 2002. Fraud statistics web page. http://www.cfenet.com/media/statistics.asp [24 June 2002].

Baucus MS, Baucus DA. 1997. Paying the piper: an empirical examination of longer-term financial consequences of illegal corporate behavior. *Academy of Management Journal* **40**(1): 129–151.

Baucus MS, Near JP. 1991. Can illegal corporate behavior be predicted? An event history analysis. *Academy of Management Journal* **34**(1): 9–36.

Beasley MS. 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *Accounting Review* **71**(4): 443–465.

Beatty RP, Zajac EJ. 1994. Managerial incentives, monitoring and risk bearing: a study of executive compensation, ownership and board structure in initial public offerings. *Administrative Science Quarterly* **39**: 313–335.

Bell TB, Knechel WR, Payne JL, Willingham JJ. 1998. An empirical investigation between the computerization of accounting systems and the incidence and size of audit differences. *Auditing: A Journal of Practice and Theory* **17**(1): 13–38.

Bologna J. 1980. Motivated climate prevents white collar crime. *Journal of Systems Management* **31**(10): 36–39.

Bowman EH. 1984. Content analysis of annual reports for corporate strategy and risk. *Interfaces*. **14**(1): 61–71.

Boyd BK. 1994. Board control and CEO compensation. *Strategic Management Journal* **15**(5): 335–344.

Boyd BK. 1995. CEO duality and firm performance: a contingency model. *Strategic Management Journal* **16**(4): 301–312.

Bruns WJ Jr. 1968. Accounting information and decision-making: some behavioral hypotheses. *Accounting Review* **43**(3): 469–480.

Bureau of Justice Statistics website. 1999. National Crime Victimization Survey. http://www.ojp.usdoj.gov/bjs/abstract/cvusst.htm [24 June 2002].

Buss D. 1993. Ways to curtail employee theft. *Nation's Business* **81**(4): 36–37.

Coffey BS, Fryxell GE. 1991. Institutional ownership and dimensions of corporate social performance: an empirical examination. *Journal of Business Ethics* **10**(6): 437–444.

Daboub AJ, Rasheed AMA, Priem RL, Gray DA. 1995. Top management team characteristics and corporate illegal activity. *Academy of Management Review* **20**(1): 138–170.

Daft RL, Macintosh NB. 1984. The nature and use of formal control systems for management control and strategy implementation. *Journal of Management* **10**(1): 43–66.

DeFond ML, Jiambalvo J. 1991. Incidence and circumstance of accounting errors. *Accounting Review* **66**(3): 643–745.

Ettore B. 1995. An ounce of prevention. *Management Review* **84**(4): 6.

Fama EF. 1980. Agency theory and the theory of the firm. *Journal of Political Economy* **88**(2): 288–307.

Fama EF, Jensen MC. 1983. Separation of ownership and control. *Journal of Law and Economics* **26**(2): 301–326.

Fan X, Chen M. 2000. Published studies of interrater reliability often overestimate reliability: computing the correct coefficient. *Educational and Psychological Measurement* **60**(4): 532–542.

Fellner BS, Mitchell LL. 1995. Communication: an essential element in internal control. *Healthcare Financial Management* **49**(9): 80–82.

Finkelstein S, D'Aveni RA. 1994. CEO duality as a double edged sword: how boards of directors balance entrenchment avoidance and unity of command. *Academy of Management Journal* **37**(5): 1079–1108.

Gardner R. 1998. How well do you really know whom you hire? *CPS Journal* **68**(3): 62–64.

Ghoshal S, Korine H, Szulanski G. 1994. Interunit communication in multinational corporations. *Management Science* **40**(1): 96–110.

Gupta AK, Govindarajan V. 1991. Knowledge flows and the structure of control within multinational corporations. *Academy of Management Review* **16**(4): 768–792.

Hatcher L, Ross TL, Collins D. 1989. Prosocial behavior, job complexity, and suggestion contribution under gainsharing plans. *Journal of Applied Behavioral Science* **25**(3): 231–249.

Hermalin B, Weisbach MS. 1991. The effects of board composition and direct incentives on performance. *Financial Management* **20**(4): 101–112.

Hill CWL, Kelley P, Agle BR, Hitt MA, Hoskisson RE. 1992. An empirical examination of the causes of corporate wrongdoing in the United States. *Human Relations* **45**(10): 1055–1076.

Hogsett RM, Radig WJ. 1994. Employee crime: the cost and some control measures. *Review of Business* **16**(2): 9–14.

Holford T. 2002. *Multivariate Methods in Epidemiology*. Oxford University Press: New York.

Holmes SA, Langford M, Welch OJ, Welch ST. 2002. Associations between internal controls and organizational citizenship behavior. *Journal of Managerial Issues* **14**(1): 85–99.

Hooks KL, Kaplan SE, Schultz JJ, Ponemon LA. 1994. Enhancing communication to assist in fraud prevention and detection. *Auditing: A Journal of Practice and Theory* **13**(2): 86–130.

Hoskisson RE, Hill CWL, Kim H. 1993. The multidivisional structure: organizational fossil or source of value. *Journal of Management* **19**: 269–298.

Jensen MC, Meckling WH. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* **3**: 305–360.

Jensen MC, Murphy KJ. 1990. Performance pay and top-management incentives. *Journal of Political Economy* **98**(2): 225–264.

Kassinis G, Vafeas N. 2002. Corporate boards and outside stakeholders as determinants of environmental litigation. *Strategic Management Journal* **23**(5): 399–415.

Key S, Messina F, Turpen R. 1998–99. Keeping employees honest. *Ivey Business Quarterly* **63**(2): 68–71.

Kinney WR Jr. 2000. Research opportunities in internal control quality and quality assurance. *Auditing* **19**: 83–90.

Larsson R, Finkelstein S. 1999. Integrating strategic, organizational and human resource perspectives on mergers and acquisitions: a case survey of synergy realization. *Organization Science* **10**(1): 1–27.

Leatherwood ML, Spector LC. 1991. Enforcements, inducements, expected utility and employee misconduct. *Journal of Management* **17**(3): 553–569.

Marginson DE. 2002. Management control systems and their effects on strategy formulation at middle-management levels: evidence from a UK organization. *Strategic Management Journal* **23**(12): 1019–1031.

Martin J. 1998. An HR guide to white collar crime. *HR Focus* **75**(9): 1–3.

Martinez JI, Jarillo JC. 1989. The evolution of research on coordination mechanisms in multinational corporations. *Journal of International Business Studies* **20**(3): 489–514.

McConaughy DL, Walker MC, Henderson GV Jr, Mishra CS. 1998. Founding family controlled firms: efficiency and value. *Review of Financial Economics* **7**(1): 1–19.

McMullen DA. 1996. Audit committee performance: an investigation of the consequences associated with audit committees. *Auditing: A Journal of Practice and Theory* **15**(1): 87–103.

McMullen DA, Raghunandan K. 1996. Enhancing audit committee effectiveness. *Journal of Accountancy* **182**(2): 79–81.

Mitchell TR, Daniels D, Hopper H, George-Falvy J, Ferris GR. 1996. Perceived correlates of illegal behavior in organizations. *Journal of Business Ethics* **15**(4): 439–455.

Mizruchi MS. 1983. Who controls whom? An examination of the relation between management and boards of directors in large American corporations. *Academy of Management Review* **8**(3): 426–436.

New York Stock Exchange. 2002. www.nyse.com [16 August 2002].

Pascale R. 1985. The paradox of 'corporate culture': reconciling ourselves to socialization. *California Management Review* **27**(2): 26–42.

Pierce JL, Rubenfeld SA, Morgan S. 1991. Employee ownership: a conceptual model of process and effects. *Academy of Management Review* **16**(1): 121–144.

Popping R. 2000. *Computer-Assisted Text Analysis*. Sage: Thousand Oaks, CA.

Rechner PL, Dalton DR. 1991. CEO duality and organizational performance. *Strategic Management Journal* **12**(2): 155–160.

Roland N. 2001. SEC examining 40 large firms for accounting fraud. *Los Angeles Times* 7 July.

Russell RC. 1995. Understanding fraud and embezzlement. *Ohio CPA Journal* **54**(1): 37–39.

Schendel D. 1992. Introduction to the Summer 1992 Special Issue on 'Strategy process research'. *Strategic Management Journal*, Summer Special Issue **13**: 1–4.

Schuster M. 1984. Cooperation and change in union settings: problems and opportunities. *Human Resource Management* **23**(2): 145–161.

Sonnenberg FK. 1991. Internal communication: turning talk into action. *Journal of Business Strategy* **12**(6): 52–55.

Stata Reference Manual. 2001. Release 7. Stata Press: College Station, TX.

Stavros JA. 1998. The forgotten factors in preventing employee fraud: employee screening. *Pennsylvania CPA Journal* **69**(1): 30–33.

Teece DJ. 1981. Internal organization and economic performance: an empirical analysis of the profitability of principal firms. *Journal of Industrial Economics* **30**(2): 173–199.

Tosi HL, Katz JP, Gomez-Mejia LR. 1997. Disaggregating the agency contract: the effects of monitoring, incentive alignment, and term in office on agent decision-making. *Academy of Management Journal* **40**(3): 584–602.

Touby L. 1994. In the company of thieves. *Journal of Business Strategy* **15**(3): 24–35.

Trevino LK, Victor B. 1992. Peer reporting of unethical behavior: a social context perspective. *Academy of Management Journal* **35**(1): 38–64.

Turner DL, Stephenson RG. 1993. The lure of white-collar crime. *Security Management* **37**(2): 57–58.

Weeks WA, Nantel J. 1992. Corporate codes of ethics and sales force behavior: a case study. *Journal of Business Ethics* **11**(10): 753–761.

Zajac EJ, Westphal JD. 1994. The costs and benefits of managerial incentives and monitoring in large U.S. corporations: when is more not better? *Strategic Management Journal*, Winter Special Issue **15**: 121–142.

APPENDIX 1: TEXT SEARCH TERMS AND TEXT EXCERPTS OR EXAMPLES

Variable	Text Search Terms	Excerpts
Accounting System	Accounting, Internal	From companies that only print their auditor's statement to companies that say 'To assure that financial information is reliable and assets are safeguarded, management maintains an effective system of internal controls and procedures, important elements of which include: careful selection, training, and development of operating and financial managers; an organization that provides appropriate division of responsibility; and communications aimed at assuring that Company policies and procedures are understood throughout the organization. In establishing internal controls, management weighs the costs of such systems against the benefits it believes such systems will provide. A staff of internal auditors regularly monitors the adequacy and application of internal controls on a worldwide basis. To insure that personnel continue to understand the system of internal controls and procedures and policies concerning good and prudent business practices, the Company periodically conducts the management's Stewardship Program for key management and financial personnel. This program reinforces the importance and understanding of internal controls by reviewing key corporate policies, procedures, and systems.'
Policies and Procedures	Policy, Policies, Duty, Duties, Manual, Training, Process	From no discussion or mention to companies that discuss organizational responsibilities, formalized procedures, ongoing training, job descriptions, periodic self-analysis to keep policies updated.
Liaison Roles (formal communication)	Meeting, Conference, Retreat, Contact, Feedback, Rotation, Interaction	From no discussion or mention to 'Last year we made progress in implementing a new worldwide employee training strategy. This revitalization of employee training and development is a major investment in our employees to help them achieve their full potential. As an example, we have established an education and conference center in New Brunswick that will provide training for our people from all parts of the world.' 'She rotates international general managers meetings quarterly among countries. To maintain close contact as the company grows, (her) Open Door policy provides a forum for all members of the worldwide sales and marketing organization to make suggestions, comments or complaints directly to her.' 'The Thursday morning meeting is a multi-disciplinary effort to track the progress of all new products under development. Keeping open lines of communication among disciplines has accelerated the product development process-an industry-leading average of 18 months from inception to market. For nearly ten years, (he) has also held a daily meeting for key members of his staff-a brief encapsulation of what has happened in the operations area over the past 24 hours.'
Teams (informal communication)	Team	From no discussion or mention to 'No football team, no baseball team, no political party or fraternity or church group, no hockey team or choir or orchestra could have a team that displays the excellence and camaraderie that our ... (company does).' 'Whether the task is performing a ... procedure or running a corporation, it is teamwork that gets the job done.'

(*continued overleaf*)

Variable	Text Search Terms	Excerpts
		'A 14-year veteran of (the company, he) knows something of both teamwork and the bottom line. His far-reaching umbrella covers all of finance and accounting, as well as management information systems, legal affairs and administration. It is the job of his people to create legal and financial harmony in a company that does business in 50 states and nearly 60 countries. And they are true disciples of the team approach. In the operations realm, for example, they work closely with engineers to develop standard costs, assist in efficient inventory management and collaborate with members of quality control so that every finished product can be traced back to the smallest component part.'
Code of Conduct	Conduct, Behavior, Integrity, Responsibility, Principles, Credo	From no discussion or mention to 'We believe that it is essential for the company to conduct its business affairs in accordance with the highest ethical standards, as set forth in the (company's) Business Conduct Guidelines. In addition, the Audit Committee reviews the Company's adherence to its Business Conduct Guidelines in compliance with federal procurement laws and regulations.' 'As we conduct ourselves in the pursuit of our existing businesses and in the growth of our businesses in an ethical and moral way, we must also fulfill our commitments to our government, to our society and to ourselves as individuals. In one sense, ethics involves the point of view that suggests we live in a glass bowl, and we should feel comfortable with any actions we take, if they were shared publicly. Further, we will conduct our affairs within the law. Should there be evidence of possible malfeasance on the part of any officer or member of management, each person must feel the responsibility to communicate that to the appropriate party. This is a commitment that each of us must undertake and not feel that it is a high-risk communication, but that it is expected and, indeed, an obligation.'
Employee Screening	Employee Screening, Applicant Testing, Hiring, Select, Recruit	From no discussion or mention to 'But our strategy for managing and sustaining that growth has remained constant: we select and hire people with a record of exceptional achievement in school and business, then give them respect and the freedom to pursue their own high standards of excellence.' 'Our recruiting, training and development, and performance appraisal processes received continued emphasis during the year. The depth of our management team benefits the company and we maintain our commitment to having the best talent in (our industry).' 'Having the best talent in (our industry) is our most important priority. All of our human resource activities—recruiting, compensation, training, performance appraisal, development—support that commitment. New in 1991 is a significantly enhanced executive development and training program responsive to the needs of our "top schools/best in class" college recruits.'
Contingent Pay for Employees	ESOP, Employee Stock Bonus, Profit Sharing, Retention, Promotion, Discount, Incentive	From no discussion or mention to performance-based bonuses, options or stock (beyond an ESOP) to all employees.

Variable	Text Search Terms	Excerpts
Audit Committee	Audit Committee	From no mention of an Audit Committee, or just the mention of its existence to 'The Audit Committee of the Board of Directors is composed solely of directors who are not officers or employees of the Company. The Audit Committee's responsibilities include recommending to the Board for stockholder approval the independent auditors for the annual audit of the Company's consolidated financial statements. The Committee also reviews the audit plans, scope, fees, and audit results of the auditors; reports on the adequacy of internal accounting controls; non-audit services and related fees; the company's ethics program; status of significant legal matters; the scope of the internal auditors' plans and budget and results of their audits; and the effectiveness of the Company's program for correcting audit findings. Company personnel, including internal auditors, meet periodically with the Audit Committee to discuss auditing and financial reporting matters.' 'The duties of the Audit Committee are (a) to recommend to the Board of Directors a firm of independent accountants to perform the examination of the annual financial statements of the Company; (b) to review with the independent accountants and with the Controller the proposed scope of the annual audit, past audit experience, the Company's internal audit program, recently completed internal audits and other matters bearing upon the scope of the audit; (c) to review with the independent accountants and with the Controller significant matters revealed in the course of the audit of the annual financial statements of the Company; (d) to review on an annual basis whether the Company's Statement of Business Conduct and Corporate Policies relating thereto has been communicated by the Company to all key employees of the Company and its subsidiaries throughout the world with a direction that all such key employees certify that they have read, understand and are not aware of any violation of the Statement of Business Conduct; (e) to review with the Controller any suggestions and recommendations of the independent accountants concerning the internal control standards and accounting procedures of the Company; (f) to meet on a regular basis with a representative or representatives of the Internal Audit Department of the Company and to review the Internal Audit Department's Reports of Operations; and (g) to report its activities and action to the Board at least once each fiscal year.'

APPENDIX 2: DICTIONARY AND SCORING SHEET

Accounting system

1 Reasonable assurance
2 Costs vs. benefits
3 Internal auditor evaluates and reports on adequacy and effectiveness, emerging accounting issues
4 New control procedures implemented, based on recommendations
5 Systematic review and modification
6 Communication throughout company, selection, training, development of qualified personnel
7 6+ more procedures, including organizational responsibility

Policies and procedures

1 Only basic
2 Training of sales people
3 Discussion of systems or examination of process (not necessarily around a profitability issue, e.g., efficiency)

4 Evidence of comprehensive, understood procedures in one division, or manager training, or quality assurance
5 Policies communicated throughout company, selection, training
6 Well-defined organizational responsibility and communication, qualified people
7 Clear organizational responsibility, formalized procedures, training to update

Code of conduct

1 None, no mention
2 Compliance
3 Social responsibility, corporate citizenship mention
4 Top management know it
5 Annual review re: code, communication to all key employees, to read, understand, and certify no violations
6 Top management training
7 Company-wide training and understanding

Formal communication

1 No mention
2 Large group, remote locations
3 Sales groups, or smaller, with limited responsibility
4 Mid level, limited cross-company
5 Cross-company cooperation and interaction
6 Managers with open doors and rotating meetings, or rotating managers
7 Training employees from all over the world in one place

Informal communication

1 No mention
2 Mention, but large, generic team, or only TMT
3 Mention of use of small teams
4 Cross-functional teams, product development, small teams
5 Team structure, products with management, strategy focus
6 Limited teams, careful selection, full participation, training
7 Teams rotate across function or geography, cross-functional management teams

Employee screening

1 No mention
2 Of financial and audit staff
3 Recruiting depth
4 Emphasis on checking qualifications
5 Training staff to interview
6 Recruiting process important, emphasized
7 6+ emphasize best talent

Employee contingent compensation

1 Employee savings plan/basic retirement plan
2 Options to key employees or 401K and post-retirement benefits to all
3 Options to key employees and 401K and post-retirement benefits to all
4 Promotion from within
5 Bonus or profit sharing available to many
6 Bonus or profit sharing available to all
7 Options or stock available to all

Board salary type

1 Flat
2 Flat + committee
3 + attendance/meeting
4 + retirement package
5 + options
6 + (stock or charity death benefits)
7 + stock and charity death benefits

Audit committee strength

1 No mention
2 Select auditors
3 + generic review, scope, plans, adequacy
4 + meet without management
5 Results discussed, overall quality financial reporting
6 Actions required, reviews, changes, other matters
7 Related to Business Conduct Code/ethics program, suggestions, recommendations
8 Reviews legal matters, company's program for correcting audit findings, etc.