Executives' "Off-The-Job" Behavior, Corporate Culture, and Financial Reporting Risk

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Abstract

We examine how executives' behavior outside the workplace, as measured by their ownership of luxury goods (low "frugality") and prior legal infractions, is related to financial reporting risk. We predict and find that chief executive officers (CEOs) and chief financial officers (CFOs) with a legal record are more likely to perpetrate fraud. In contrast, we do not find a relation between executives' frugality and the propensity to perpetrate fraud. However, as predicted, we find that unfrugal CEOs oversee a relatively loose control environment characterized by relatively high and increasing probabilities of other insiders perpetrating fraud and unintentional material reporting errors during their tenure. Further, cultural changes associated with an increase in fraud risk are more likely during unfrugal (vs. frugal) CEOs' reigns, including the appointment of an unfrugal CFO, an increase in executives' equity-based incentives to misreport, and a decline in measures of board monitoring intensity.

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1. Introduction

We examine how and why two aspects of top executives' behavior outside the workplace, as measured by their legal infractions and ownership of luxury goods, are related to the likelihood of future misstated financial statements, including fraud and unintentional material reporting errors.[1] We investigate two potential channels through which executives' outside behavior is linked to the probability of future misstatements: 1) the executive's propensity to misreport (hereafter "propensity channel"); and 2) changes in corporate culture (hereafter "culture channel").[2]

Motivated by the criminology literature, we interpret an executive's prior legal infractions, including driving under the influence of alcohol, other drug-related charges, domestic violence, reckless behavior, disturbing the peace, and traffic violations, as symptoms of a relatively high disregard for laws and lack of self-control. We predict and find a direct, positive relation between CEOs' and CFOs' prior records and their propensity to perpetrate fraud (propensity channel), as reflected in the executive being named for fraudulent corporate reporting in a Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Release (AAER). We find no relation between CEOs' prior legal infractions and *other* insiders being named in an AAER, unintentional reporting errors, or other symptoms of a relatively weak control environment (culture channel).

We interpret an executive's ownership of luxury goods, including expensive cars, boats, and houses, as a symptom of relatively low "frugality." Motivated by the psychology and managerial accounting literatures, we predict that CEOs who refrain from acquiring luxury goods (hereafter "frugal CEOs") are likely to run a "tight ship" relative to unfrugal CEOs (culture channel). Consistent with the culture channel, we find that the probabilities of both fraudulent reporting by other insiders and erroneous reporting are higher in firms run by an unfrugal (vs. frugal) CEO, and these differences

[1] We consider an executive's legal infractions and luxury asset ownership over the period up to and including the year before the reporting error or initiation of fraud. We refer to these as "prior" legal infractions and luxury asset ownership.

[2] We use "culture" to refer to a firm's multifaceted control environment with likely effects on the risk of misreporting (e.g., internal control systems, director monitoring, equity-based incentive plans, reliability of CFO). Hereafter, we use "culture" and "control environment" interchangeably.

become more pronounced over the CEO's tenure. Further, we find some evidence that the increasing probability of fraud over the tenure of unfrugal CEOs is associated with the appointment of an unfrugal CFO, as well as an increase in more "traditional" fraud risk factors, i.e., an increase in executives' equity-based incentives and weakened board monitoring. In contrast to executives with records, we find no evidence that unfrugal executives have a higher propensity to perpetrate fraud.

The interpretation of our results is subject to several caveats. First, due to the high cost of the background checks used for data on legal records and asset ownership, our fraud and error samples are small, and have a high proportion of fraud and error firms relative to the underlying population of firms.[3] Second, our fraud and error samples include only firms whose misreporting is *detected* and *enforced*, raising the possibility that our results are confounded by factors associated with the SEC's detection and enforcement procedures. And third, endogenous sorting of executives to firms may bias our results. Our results are robust to a variety of identification strategies for addressing the latter two issues, mitigating these concerns.

Subject to these caveats, our paper makes three main contributions. First, we provide new evidence on the risk of materially misstated financial statements. Second, we introduce novel measures of executive "type" based on prior legal infractions and luxury asset ownership. We document evidence that these measures of executives' "off-the-job" behavior capture meaningful differences in managerial style in a financial reporting context, raising the possibility that these measures are useful in exploring other aspects of corporate behavior and performance. And third, we provide the first evidence of which we are aware of how changes in corporate culture over the tenure of CEOs differ in an intuitive and intriguing way by CEO type.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and develops our hypotheses. Section 3 describes the sample and data and provides some descriptive statistics. Section 4 presents our analysis of the relation beween fraud and executive type, and our

[3] The sample for our main analysis of fraudulent reporting includes 109 fraud firms and 109 matched non-fraud firms. The sample for our analysis of reporting errors includes 94 error firms and 179 control firms.

analysis of the propensity channel. Section 5 presents our analysis of the culture channel. Section 6 presents sensitivity analyses and Section 7 provides concluding remarks and future research opportunities.

2. Hypotheses development

2.1. Overview of the literature

Our research builds on several literatures. Hambrick and Mason's (1984) "Upper Echelons Theory" argues that managers' experiences, values, and cognitive styles, such as honesty, affect their choices and consequent corporate decisions. Consistent with this theory, Bertrand and Schoar (2003) document significant manager fixed effects with respect to corporate investment behavior, financing policy, organizational strategy, and performance. Similarly, Bamber, Jiang, and Wang (2010) and Dyreng, Hanlon, and Maydew (2010) document significant management fixed effects with respect to firms' voluntary accounting disclosures and corporate tax avoidance, respectively.

Our reliance on off-the-job behavior to measure executive type offers two advantages over the use of manager fixed effects to measure managerial "style." First, executives' "off-the-job" behavior is less likely to be affected than on-the-job behavior by characteristics of the firm such as the incentive plans and the control environment, facilitating the identification of executive type. Second, manager fixed effects do not identify specific characteristics of executives, but rather capture all relevant managerial time-invariant characteristics such as preferences, ability, and backgrounds.

Some prior studies focus on identifying specific managerial characteristics associated with corporate decisions and/or performance. For example, Kaplan, Klebanov, and Sorensen (2012) find that subsequent corporate performance is positively associated with CEOs' general abilities and execution skills, and Malmendier and Tate (2009) document that award-winning "superstar" CEOs subsequently underperform, manage earnings more, and extract more compensation.

Personal characteristics that have received considerable attention are overconfidence and narcissism. Roll (1986) argues that management overconfidence is associated with unsuccessful

corporate takeovers. Malmendier and Tate (2008, 2005) find that overconfident CEOs are more likely to engage in value-destroying mergers and acquisitions (M&A) and link overconfidence to corporate investment decisions. Cain and McKeon (2012) argue that overconfidence leads to increased overall risk-taking and more frequent M&A activity, while Schrand and Zechman (2012) find that overconfident CEOs are more likely to initially overstate earnings by small, within Generally Accepted Accounting Principles (GAAP) amounts, which can then put them on a "slippery slope" to accounting fraud. Aktas, Bodt, Bollaert, and Roll (2012) find that CEO narcissism in both the acquirer and target companies has a negative effect on the takeover process. Based on psychometric tests administered to CEOs, Graham, Harvey, and Puri (2013) find evidence consistent with a matching between behavioral traits of executives and the kinds of companies they join. In addition, they find these behavioral traits, such as optimism and risk aversion, help explain compensation structure. The endogenous matching of CEOs to firms based on preferences is also documented by Cronqvist, Makhija, and Yonker (2012), who further find that CEOs' personal leverage choices explain the corporate financial behavior of the firms they manage.[4]

Our study also builds on the auditing and earnings management literatures. The auditing literature has long acknowledged the potential importance of ethics and tone at the top. The concept of a "Fraud Triangle" was formally incorporated in Statement on Auditing Standards No. 99 (*Consideration of Fraud on a Financial Statement Audit*, October 2002), specifying three prerequisites for fraud: 1) an *incentive* or pressure to commit fraud, 2) an *opportunity* to perpetrate fraud (e.g., absence of controls, ineffective controls, or the ability of management to override controls), and 3) an *attitude* that enables the rationalization of fraud (hereafter, a "propensity" to perpetrate fraud). Prior earnings management

[4] There is also some evidence linking religion and corporate behavior. Specifically, Grullon, Kanatas, and Weston (2010) find that firms headquartered in highly religious counties are less likely to backdate options, grant excessive compensation to executives, manage earnings, and be the target of class action lawsuits. Hilary and Hui (2009) find that firms located in counties with higher levels of religiosity display lower risk exposures, lower investment rates, and less growth. However, they find that new investments by these firms generate more positive market reactions. In our sensitivity analyses (see Section 6.1), we verify that our results are robust to controlling for the religiosity of the county in which the company is headquartered.

research focuses primarily on the first two factors (i.e., incentives and opportunities), with the notable exception of Schrand and Zechman (2012).[5]

We build on these literatures by examining how and why executives' prior behavior outside the workplace is associated with the risk that financial statements are materially misstated, including fraud and material reporting errors.[6] While both types of misreporting misinform capital markets, analysts, competitors, suppliers, directors, and other users of financial statements, they are distinguished by intent; fraud is intentionally perpetrated by insiders, while errors are unintentional, and generally viewed as a manifestation of a weakness in a firm's internal control systems.

Our focus on executives' prior legal records as a financial reporting risk factor is motivated by the criminology and psychology literatures. The criminology literature defines crime as an act of force or fraud undertaken in the pursuit of self-interest, and argues that individuals with greater propensities to commit crimes are likely to have low self-control and are less likely to conform to social norms and laws (Gottfredson and Hirschi, 1990). Jones and Kavanagh (1996) show that individuals lacking conventional morality exhibit significantly more unethical behavioral tendencies than others. Blickle, Schlegel, Fassbender, and Klein (2006) argue that low self-control and high hedonism are positively related to the likelihood of committing white-collar crime. Further, individuals displaying unethical tendencies, such as past criminal behavior, tend to persist in this type of behavior by justifying it through moral disengagement and by exhibiting motivated forgetting of information that might otherwise limit their dishonesty (Gendreau, Little, and Goggin 1996; Shu, Gino, and Bazerman, 2011). Finally, Fisman and Miguel (2007) find that United Nations diplomats' unpaid parking tickets in New

[5] A large literature focuses on the motives and opportunities to misreport. See, for example, DeFond and Jiambalvo (1991), Dechow, Sloan, and Sweeney (1995), Beasley (1996), Klein (2002), Abbot, Parker, and Peters (2004), Agrawal and Chadha (2005), Farber (2005), Erickson, Hanlon, and Maydew (2006), Larcker, Richardson, and Tuna (2007), Davidson (2013), Dechow, Ge, Larson, and Sloan (2011), Dey and Liu (2013), and Schrand and Zechman (2012).

[6] While CEO legal infractions and low frugality may be related to other CEO attributes such as overconfidence and risk-seeking, we argue that these capture distinct character traits of individuals. In sensitivity analyses (see Section 6.1), we find that measures of CEO overconfidence, narcissism, and risk-seeking are not significantly correlated with our measures of CEOs' records and frugality, and our results are robust to controlling for measures of CEO overconfidence, narcissism, and risk-seeking tendencies.

York City are significantly related to the corruption and legal enforcement in their home country, suggesting that even minor legal violations can capture differential behavioral norms.

Our focus on executives' ownership of luxury goods as a financial reporting risk factor is motivated by considering insights from both the psychology and managerial accounting literatures. We interpret executives' ownership of luxury goods as a manifestation of relatively low frugality.[7] Frugality is identified in the consumer psychology literature as a distinct psychological trait characterized by the degree to which a consumer is both restrained in acquiring and resourceful in using goods and services to achieve long-term goals (De Young, 1996; Lastovicka, Bettencourt, Hughner, and Kuntze, 1999). This research suggests that frugality is not synonymous with pure deprivation or cheapness, but rather reflects discipline in buying and using consumer goods and services to achieve longer-term goals. Further, frugality is likely to be indistinct from non-materialism (Lastovicka, Bettencourt, Hughner, and Kuntze, 1999). Anderson and Lillis (2011) examine the notion of *corporate* frugality and suggest that it indicates an enduring corporate trait of consistent disciplined management of spending to achieve long-term strategic objectives.[8] The question naturally arises as to how an executive's stewardship of corporate resources varies with the frugality observed in his lifestyle.

2.2. Testable predictions

If the presence/absence of a record captures meaningful variation in regard for laws and self-control, we expect executives with a record to have a relatively strong propensity to intentionally mislead investors (propensity channel).[9] Hence, we predict that firms run by record holders are more

[7] Liu and Yermack (2012) interpret the purchase of large homes as signals of CEO entrenchment, and find that such purchases are associated with a deterioration in future corporate performance.

[8] Other researchers also stress the importance of key individuals, such as the CEO or the CFO, in promoting an individual culture of frugality in an organization (Mazzini, 1989). Some examples include Sam Walton's tightfisted management of Wal-Mart and Ingvar Kamprad's policy of continuous cost reduction at IKEA.

[9] The link between records and a disregard for laws and lack of self-control may arguably vary with the severity of the infraction (e.g., speeding tickets vs. more severe violations) and/or the number of infractions. Our

likely to issue fraudulent financial statements, and that record holders are more likely to be named by the SEC for perpetrating fraud. In contrast, we do not expect an executive's propensity to misreport to have a direct effect on the probability of reporting *errors*, since errors are deemed unintentional. However, a corporate culture that is more conducive to misstatements may be established during the reign of record holder CEOs, elevating the risk of errors and fraud (culture channel).[10]

If our measure of the ownership of luxury goods captures meaningful variation in executives' frugality, and if frugal CEOs oversee a culture of corporate frugality characterized by relatively strong discipline and rigorous controls (culture channel), we expect firms run by *unfrugal* CEOs to have higher financial reporting risk than firms run by frugal CEOs, as evidenced by a relatively high probability of fraudulent corporate reporting, of other insiders being named in fraud, and of unintentional reporting errors. We expect these three differences to become more pronounced over the tenure of unfrugal CEOs as the control environment deteriorates (relative to firms run by frugal CEOs). Finally, we expect the increase in fraud risk over the tenure of unfrugal (vs. frugal) CEOs to be associated with changes in measured aspects of the control environment, including an increase in executives' equity-based incentives to misreport, the appointment of an unfrugal or record holding CFO, a decline in board monitoring intensity, and an increase in the estimated probability of a material internal control weakness due to changes in the firm's business model.

We include the appointment of a CFO with a record or an unfrugal CFO as a measure of a weakening culture due to the hypothesized disregard for rules and lack of focus on controls by record holders and unfrugal executives, respectively. We consider executives' equity-based incentives because prior researchers posit an associated motivation to mislead the capital markets by inflating reported performance (e.g., Erickson, Hanlon, and Maydew, 2006; Davidson, 2013; Armstrong,

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results are robust to using two alternatives to the presence/absence of a record: 1) presence/absence of speeding tickets; 2) number of prior infractions.

[10] Sorting of CEOs with records to firms with a weak control environment also could lead to more misreporting in firms run by such CEOs. However, we find no evidence of sorting of record holders to such firms in our matched sample, suggesting that sorting is not driving our results. An interesting question for future research is whether record holder CEOs sort to firms with distinct cultures, growth opportunities, managerial discretion, regulatory environments, risk, etc. in *unmatched* samples.

Jagolinzer, and Larcker, 2010; Johnson, Ryan, and Tian, 2009) and find mixed support for this hypothesis.

We consider the probability of a material control weakness as a symptom of deterioration in culture because ineffective internal control systems increase opportunities to perpetrate fraud and the likelihood of unintentional reporting errors. Our estimates of the probability of a material weakness in internal controls for each year in the tenure of sample CEOs, based on a simplified version of Doyle, Ge, and McVay (2007),[11] are intended to capture a change in the risk of a material control weakness due to a change in business strategy. If the effectiveness of internal controls is reduced, for example, by the corporate growth and investment strategies of unfrugal or record holder CEOs, more misstatements are likely to result.[12]

Finally, we consider three measures of the intensity of board monitoring as a symptom of the culture/control environment: the stock-based compensation of independent directors as a percentage of shares outstanding (increases board monitoring), the structural independence of the board (increases board monitoring), and whether the CEO is socially connected to any of the independent directors (decreases board monitoring). The latter measure is motivated by recent papers documenting that social ties with the CEO can compromise the monitoring activities of otherwise independent directors (Hwang and Kim, 2009; Dey and Liu, 2013). There is at least some evidence (albeit mixed) that board monitoring as measured by each of these proxies is associated with financial reporting quality (Bhagat and Bolton, 2008; Bhagat, Carey, and Elson, 1999; Klein, 2002; Farber, 2005; Larcker, Richardson, and Tuna, 2007; Dey and Liu, 2013).

Although, as described above, we predict that unfrugal (vs. frugal) CEOs are associated with relatively high financial reporting risk through the culture channel, we have no clear prediction about

[11] We exclude one explanatory variable, special purpose entities (SPEs), from the Doyle, Ge, and McVay (2007) model due to a lack of data.

[12] In a related study focused on the relation between CEO frugality and corporate investment behavior, we find preliminary evidence that unfrugal CEOs engage in more acquisitions, invest less in organic growth (i.e., research and development), and generate lower future accounting and stock returns per dollar invested than frugal CEOs. Such changes in business strategy may reduce the effectiveness of internal control systems.

whether unfrugal executives have a higher probability of being named in fraud than frugal executives, since there is no obvious connection between one's frugality and regard for laws (propensity channel). While unfrugal (i.e., materialistic) CEOs presumably have a relatively strong desire to maintain a luxurious lifestyle with high compensation (e.g., bonuses, option gains, etc.), it seems unlikely that this temptation will induce unfrugal CEOs to commit fraud unless they have an attitude that enables them to rationalize the crime. This is ultimately an empirical question.

To summarize, we predict that firms run by CEOs who have a legal record or own luxury goods have a higher probability of future material misstatements. However, our priors differ with regard to how and why legal records and asset ownership are related to reporting risk. We expect record holders are more likely to be directly involved in perpetrating fraud (propensity channel). And we expect that a corporate culture conducive to misstatements (fraud and/or errors) is more likely in firms run by unfrugal CEOs (vs. frugal CEOs), and possibly record holders (culture channel), with such cultural differences becoming more pronounced over the course of the CEO's tenure.

3. Sample, data, and descriptive statistics

3.1. Sample and data

We derive our sample of fraud firms from all SEC AAERs released through June 2010. These releases summarize investigations the SEC brings against the agents of firms for violations of SEC and federal rules, and provides detailed information regarding the nature and timing of the violation (including the start and end dates), the accounts that were manipulated, and the direction of manipulation. Over the violation period 1980 through 2004, we have a total of 3,148 AAERs. We only consider firms for which it can be determined that their financial statements were materially misstated. After eliminating AAERs not involving accounting fraud and redundant cases, we are left with 852 firms. We remove from this sample 28 AAERs due to option backdating and asset or revenue understatements. After merging the remaining sample with the Center for Research in Security Prices

(CRSP), Compustat, and ExecuComp (which begins in 1992), we are left with 109 firms whose fraud was initiated between 1992 and 2004.[13] Table 1, Panel A summarizes the sample selection process.

**** Insert Table 1 Panel A here ****

We use propensity score matching to create a matched control sample for our fraud analysis. For each fraud firm, we select a control firm from the same Fama-French industry group (five-industry classification). We generate estimates of fraud probabilities from a logit model (fraud vs. no fraud) estimated for all firms with available data for seven model variables: CEO age, average total assets, debt-to-equity ratio, excess stock returns, standard deviation of excess stock returns, and market-to-book (MTB) value of equity, all measured in the year prior to the fraud initiation of a given fraud firm, and the equity beta estimated over the prior three years. By considering industry, year, firm size, growth opportunities, leverage, and volatility, we are attempting to match on important aspects of the business and contracting environment. We incorporate abnormal stock returns in the year prior to the fraud initiation year to mitigate recent performance differences between the two samples. Finally, we consider CEO age due to the potential influence of age on an executive's record, asset ownership, and financial reporting behavior.

We depict our fraud firm-years with an indicator variable, *FRAUD,* that equals one in fraud firm-years, and zero for all other firm-years.[14] For all fraud firms, we examine whether any executives were named by the SEC as being directly involved in the perpetration of the fraud. *EXEC_NAMED* (*CEO_NAMED*) is an indicator variable equal to one in firm-years for which a given executive (CEO) is named by the SEC for perpetrating the fraud, and zero otherwise.

We obtain our sample of material reporting errors by combining the sample of restatements due to errors from the Audit Analytics database with the error sample in Hennes, Leone, and Miller (2008).[15]

[13] About 70% of our sample firms initiated fraud between 1997 and 2001.

[14] We include all years since the CEO of each fraud firm was appointed for which we have data, up to and including the year of the initiation of the fraud. We use the same years for each fraud firm's matched non-fraud firm.

[15] Hennes, Leone, and Miller (2008) begin with the U.S. Government Accountability Office (GAO) database of restatements, and identify the subset resulting from clerical errors. The GAO database excludes

Our error sample includes 94 firms over the sample period 1995 – 2005. Our corresponding control sample comprises the 109 non-fraud firms in the control group for our fraud analyses as well as 70 firms that do not have reporting errors randomly selected from the seven largest industry groups as defined by two-digit Standard Industrial Classification (SIC) codes over the sample period. We depict error firm-years with an indicator variable, *ERROR*, that equals one for the year when the firm had an error in its financial statements (subsequently restated), and equals zero in all other sample firm-years.

Our data on executives' legal infractions and ownership of real estate, boats, luxury vehicles, and motorcycles are obtained from numerous federal, state, and county databases accessed by licensed private investigators. We augment our real estate data by hand-collection of public information on the Internet.[16] The legal infractions include criminal convictions, specifically, traffic violations, driving under influence (DUI) of alcohol and other drug and alcohol related charges, reckless endangerment, and domestic violence charges. We set an indicator variable, *RECORD*, equal to one if the executive has any such convictions in his personal record as of the year prior to the year of the initiation of the fraud (or the corresponding year for the matched control (nonfraud) firm), and zero otherwise.[17] *FRUGAL* is an indicator variable equal to one if the executive does not own any luxury assets, including a primary residence worth more than twice the average of the median home prices in the zip codes within 15 miles of the corporate headquarters, any additional residences or vacation homes worth more than twice the average home price in that metropolitan area (as defined by the Core Based Statistical Area (CBSA)), boats greater than 25 feet in length, and cars with a purchase price greater

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restatements that are not due to errors or manipulation. Specifically, the GAO claims to exclude restatements related to "mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues (for example, converting from Canadian dollars to U.S. dollars), changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, general accounting changes under Generally Accepted Accounting Principles (GAAP), litigation settlements, and arithmetic and general bookkeeping errors. As a general rule we also excluded restatements resulting from accounting policy changes because they did not necessarily reveal previously undisclosed, economically meaningful data to market participants."

[16] Our acquisition and use of asset data conforms to all provisions of the Driver's Privacy Protection Act (DPPA).

[17] As a sensitivity check, we employ an alternative measure of *RECORD* that is set to one if the executive has any convictions in his record, regardless of when they occurred. Our results are robust to this alternative.

than $75,000, at any time prior to the fraud initiation year (or the corresponding year for the matched control firm), and zero otherwise.[18]

We obtain data for measures of board monitoring from several sources. We use the proportion of the directors who are independent and the stock-based compensation of independent directors from the RiskMetrics database, supplemented with hand-collected data from annual proxy statements. We obtain social connections between the CEO and independent directors from BoardEx of Management Diagnostics Limited, a private research company specialized in social network data on company officials of US and European public and private companies. The data contain relational links between directors and other officials for active companies. Links in the data set are constructed by cross-referencing employment history, educational background, and professional qualifications.[19] To examine the social connections of independent directors with their CEOs, we consider whether an independent director overlapped with the CEO in the past for two or more years in at least one of the following: university, military service, employer. We also consider the director to be socially connected to the CEO if he or she is a member of one or more clubs (e.g., country clubs), serves in one or more charities, or is a member of other similar organizations with the CEO.

We use an overall measure of the quality of corporate governance from Governance Metrics International (GMI), executive compensation data from ExecuComp (supplemented with hand-collected data from proxy statements on executives' perquisites), executive age from ExecuComp and BoardEx, and analyst information from the Institutional Brokers' Estimate System (I/B/E/S). We hand-collect news articles and press releases from Factiva to measure the media coverage of sample firms and CEOs, and the area covered by CEOs' signatures from proxy statements and 10-K filings to measure CEO narcissism. We use data from the American Religion Data Archive (ARDA) and the US Census Bureau to measure the proportion of the population belonging to a mainstream religious

[18] For the analysis of reporting errors, our indicator variables *RECORD* and *FRUGAL* are defined in analogous fashion using the year prior to the reporting error rather than the year prior to the initiation of fraud.

[19] BoardEx does not depend on business professionals to volunteer their own data on the above aspects. Instead, more than 500 trained analysts gather data on business professionals.

institution in each county where a sample firm is headquartered. Other firm characteristics and stock return data are obtained from Compustat and CRSP, respectively. All continuous variables are winsorized at the 1% and 99% levels. The Appendix presents definitions and data sources for all variables.

3.2. Descriptive statistics

Figs. 1 and 2 (3 and 4) portray the frequencies of legal infractions and ownership of assets by type for the fraud and non-fraud samples (error and non-error samples). As reported in Table 2, the measures of CEO type are significantly different across the fraud and control samples. More CEOs in the fraud sample have records: specifically, 20.2% (22 of 109) of the fraud firm CEOs have a record, as compared to 4.6% (5 of 109) of CEOs of non-fraud firms (*t*-test of the difference is significant at 0.01 level). The total number of legal infractions in the fraud sample is 38 vs. 9 in the control sample (difference significant at 0.01 level). These include 12 CEOs with serious crimes (such as reckless behavior and domestic violence, driving under influence, and felony drug charges), comprising 11% of CEOs in the fraud sample versus no CEOs with serious crimes in the control sample.

**** Insert Figures 1, 2, 3 and 4 and Table 2 here ****

CEOs in the fraud sample appear modestly less frugal (67 unfrugal CEOs in the fraud sample vs. 53 in the control sample, difference significant at 0.10 level). Specifically, 56% of cars worth at least $75,000 and 58% of boats are owned by CEOs in the fraud sample (both significant at 0.10 level). Fifty-four percent of expensive homes (as valued by more than two times the average of median prices within 15 miles of the corporate headquarters) are owned by fraud firm CEOs (not significant).

The percentages of CEOs with records are generally similar across the error (8%) and control (7%) samples. However, ownership of luxury goods is significantly (0.05 level) more prevalent among CEOs in the error sample; specifically, 65% of the error firm CEOs own luxury goods vs. 47% of non-error firm CEOs. A significantly higher percentage of error firm CEOs (vs. control firm CEOs) possess cars above $75,000 (29% vs. 20%), boats longer than 25 feet (34% vs. 22%), and houses worth more

than twice the average price in neighboring zip codes (37% vs. 26%). These univariate results are in line with the conjecture of a relatively "loose" control environment in firms run by unfrugal CEOs.

Table 3 presents descriptive statistics for various board, firm, and CEO characteristics for our matched sample of fraud and non-fraud firms, and error and non-error firms. The variables are measured as of the year before the fraud was initiated and the year before the error occured (or the corresponding year for the matched control firms).[20] The main differences are discussed below.

**** Insert Table 3 here ****

Fraud firms have lower governance quality than control firms as measured by the relatively low overall governance index (*GOVSCORE*) and the high proportion of outside directors with social connections to the CEO (*SOCIAL*). Fraud firms also have more visibility as measured by relatively high analyst following (*ANALYST_FOLL*) and press coverage (*MEDIA_FIRM*), higher fraud risk as measured by the *F*-Score from model (1) of Dechow, Ge, Larson, and Sloan (2011), and higher risk of a material internal control weakness as measured by our modified model from Doyle, Ge, and McVay (2007) (*IC_WEAKNESS*). Surprisingly, fraud firms are located in counties with higher religious intensity (*RELIGION*) and belong to industries (two-digit SIC code) with a lower percentage of fraud firms (*%IND_FRAUD*). Finally, CEOs in the fraud sample have more wealth (*WEALTH*), shorter tenure (*TENURE*), more overconfidence (*OVERCONFIDENCE*), and more press coverage (*MEDIA_CEO*) than the CEOs in the control sample.

As expected, the estimated risk of an internal control weaknesses associated with a firm's business model (including that in the first year of the CEO's tenure (*IC_WEAKNESS_START*) as well as the year before the error occurred (*IC_WEAKNESS*)), is significantly higher in the error sample. We estimate the internal control weakness as the fitted value from a modified version of the model in Doyle, Ge, and McVay (2007) including firm size, firm age, loss, foreign transactions, acquisitions,

[20] Our results are robust to the following alternative approaches for measuring all variables for the control sample in the errors analysis: 1) variables are measured as of 2000 which is the median year for the occurrence of errors; 2) variables are measured as of 2003 which is the 75th percentile year for the occurrence of errors; and 3) variables are measured as of the latest year for the firm in the sample.

sales growth, restructurings, and the number of business and geographic segments. Each of these individual components is significantly different across the error and control firms (except for restructurings). Specifically, error firms are smaller, younger, have high losses, fewer foreign currency transactions, lower acquisition intensity, higher sales growth, and fewer segments. In addition, error firms have marginally higher average CEO tenure.

4. Executive type vs. fraud and the propensity channel

4.1. Empirical analyses of matched sample of fraud and non-fraud firms

We test whether the likelihood of fraud varies with CEO type (measured by *RECORD* and *FRUGAL*) using a dynamic hazard model, setting *FRAUD* equal to one for fraud firm-years, and zero otherwise (including non-fraud years of the fraud sample firms and all years of the non-fraud sample firms). Our rationale for choosing the hazard model over a single-period logit model is based on Shumway (2001), which indicates two shortcomings in multinomial choice models: (1) a sample selection bias that may arise from using only one, non-randomly selected observation per firm, and (2) a failure to model time-varying changes in the underlying or baseline risk of an event (such as bankruptcy or fraud). A hazard model overcomes these methodological concerns by including every available firm-year observation. Our base "fraud" model appears below:

$$FRAUD = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times FRUGAL + \alpha_3 \times TOBIN'S\_Q + \alpha_4 \times ROA + \alpha_5 \times \%IND\_FRAUD + \varepsilon. \quad (1)$$

The variable *%IND_FRAUD* (the percentage of firms in the same two-digit industry that are fraud firms in the current year) is included to control for the industry-related incidence of fraud using a narrower definition of industry than used to identify the matched control firms. Lagged values of Tobin's *Q* and return on assets (ROA) are included to control for firm performance.[21]

[21] We repeat the above analysis (and all subsequent analyses) by replacing the indicator variables, *RECORD* and *FRUGAL*, with the number of legal infractions and number of luxury assets (houses, cars, and boats). Our (untabulated) results are generally similar to those reported.

To test whether the likelihood of being *named* as a perpetrator of fraud (propensity channel) varies by CEO type (*RECORD* and *FRUGAL*), we estimate the following hazard model ("CEO named" model):

$$CEO\_NAMED = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times FRUGAL + \alpha_3 \times TOBIN'S\_Q + \alpha_4 \times ROA + \alpha_5 \times \%IND\_FRAUD + \varepsilon. \quad (2)$$

The dependent variable, *CEO_NAMED* , is equal to one in fraud-years for which the CEO is named in the AAER as being a perpetrator of fraud, and zero in all other firm-years for all fraud and nonfraud firms. We expect record holders to have a relatively high propensity to perpetrate fraud ($\alpha_1 > 0$); however, we do not have strong priors about the relation between *FRUGAL* and *CEO_NAMED* (α_2).

We check the robustness of results from the base models to the inclusion of a variety of additional control variables. One set of variables attempts to control for the visibility of the firm and the CEO. A potential concern is that our fraud sample is limited to firms for which the violation of GAAP is *detected* and *enforced*.[22] To the extent fraud detection and/or enforcement procedures (against the firm and/or specific individual) vary with CEO type, our interpretation of results as evidence of fraudulent reporting, per se, is problematic. In light of prior research suggesting that the visibility of the firm increases the likelihood of detection (Miller, 2006), we add several controls for visibility, including press coverage of the firm, press coverage of the CEO, analyst following, and auditor changes.[23]

We also control for the wealth of the CEO because wealthier CEOs are more likely to own more luxury goods. We include perquisites the CEO receives from the firm in a given year to control for their potential substitution for a CEO's ownership of luxury goods. We include the *F*-Score, the predicted probability of misstatements using the primary model developed by Dechow, Ge, Larson, and Sloan (2011), and a measure of the overall governance quality of the firm to control for additional

[22] As discussed in Dechow, Ge, Larson, and Sloan (2011), the SEC identifies firms for review through anonymous tips, news reports, voluntary firm restatements, and the SEC's own review practices. The SEC's reliance on multiple sources may reduce to some extent the influence of the SEC detection methods on our analysis. However, we attempt to mitigate this concern through the use of matched samples, the inclusion of control variables for firm and CEO visibility, and a test based on CEO-CFO pairs of fraud firms.

[23] We only report the results for press coverage, but the results for *RECORD* and *FRUGAL* are similar for analyst following and auditor changes.

firm and governance characteristics that may be associated with misstatements. [24, 25] Because the inclusion of each of the additional control variables results in a loss of observations, we report results for models with and without each of these additional controls.

Table 4 presents the results of model (1).[26] As predicted, we find a significant positive relation between *FRAUD* and *RECORD* (significant at the 0.01 level in all models). The hazard ratio for *RECORD* in the base model (column 1) indicates that the probability of fraud in the next year is higher (in the matched sample) by approximately 120% in firms run by CEOs with a legal record than in firms run by CEOs with a clean record. In contrast, we do not find a significant relation between *FRAUD* and *FRUGAL* in any of the models in Table 4.

**** Insert Table 4 here ****

Table 5, Panel A presents the results of the CEO-named model (2), representing our investigation of the direct involvement of the CEO in fraudulent reporting (propensity channel). The results provide strong support for our prediction that record holders are more likely to be named for perpetrating fraud (*RECORD* is significant at the 0.01 level in all models). The hazard ratio for *RECORD* indicates that the probability that a firm's CEO is named for perpetrating fraud is higher (in the matched sample) by 647% in firms run by CEOs with a legal record than in firms run by CEOs with a clean record.[27] In

[24] Model (1) from Dechow, Ge, Larson, and Sloan (2011) includes accruals based on the accruals model developed by Richardson, Sloan, Soliman, and Tuna (2005), the change in receivables, the change in inventory, % soft assets, the change in cash sales, the change in ROA, and an indicator variable measuring the issuance of stock and/or debt. To the extent that the *F*-Score is based on *symptoms* of fraudulent reporting (accruals, etc.), inclusion of the *F*-Score may "throw the baby out with the bath water." However, a comparison of the results with vs. without the *F*-Score reveals that this is not the case.

[25] Governance Metrics International uses both accounting and governance information to develop a governance index (*GOVSCORE*) that ranges from one to hundred, with higher values indicating better governance. However, as an additional check (in untabulated results), we also include more traditional control variables for executives' equity-based incentives to misreport (*DELTA*), and opportunities to misreport (board monitoring *(%INDEP*, *SOCIAL*, and *DIR_SHARES*) and probability of an internal control weakness due to business strategy (*IC_WEAKNESS*)). Our results are robust to these additional controls.

[26] Standard errors are clustered by firm in all analyses. As a robustness check, we cluster standard errors in fraud models by matched pair and find consistent results.

[27] It is interesting to note that the pseudo R^2 and hazard ratio for *RECORD* are 4–5 times higher for the CEO named models than for the analogous fraud models reported in Table 4. This is consistent with the relatively important link between a CEO's legal record and his propensity to perpetrate fraud.

contrast, we do not find a significant relation between *CEO_NAMED* and *FRUGAL* in any of the models in Table 5.

**** Insert Table 5 Panel A here ****

4.2. Additional analysis of the propensity channel: CEO-CFO pairs of the fraud sample

An important concern in the above models is the potential for omitted correlated variables. For example, if executives sort to firms in a nonrandom fashion, then the variables measuring CEO type may be proxying for such omitted firm characteristics. The nonrandom matching of executives with firms generally makes the identification of "executive effects" difficult. However, the AAERs identify the executive(s) named as the perpetrator of the fraud, providing a unique setting to identify the relation between executives' personal vs. financial reporting behavior while holding constant firm-level factors (and all other non-executive level factors) for each set of executives.

We consider a subsample of 75 fraud firms where the CEO was named in 48 cases, and the CFO was named in 37 cases (both executives were named in 30 cases and neither were named in 14 cases).[28] In this subsample of fraud firms, 24% of the CEOs and 17% of the CFOs had legal infractions prior to the year of fraud initiation. In comparison, 31% of the *named* CEOs and 22% of the *named* CFOs had legal infractions. Also, 32% of the CEOs and 25% of CFOs in the subsample of fraud firms were classified as unfrugal prior to the year of fraud initiation, as compared to 33% of *named* CEOs and 32% of *named* CFOs. Using data on the legal infractions and luxury asset ownership for 75 CEOs and 75 CFOs of the subsample of 75 fraud firms (and excluding all nonfraud firms), we test whether the likelihood that a given CEO or CFO is named in perpetrating the fraud is positively related to his legal infractions or low frugality, controlling for the press coverage of the given executive during the fraud period.

[28] Given the high cost of data on legal infractions and asset ownership, we selected a random subsample of the 109 fraud firms for this analysis of CEO-CFO pairs.

The results of the estimated logit regression are reported in Table 5, Panel B. The coefficient on *RECORD* is statistically significant at the 0.05 level. The marginal effect of this coefficient (significant at 0.01 level) suggests that the likelihood of a given CEO or CFO at a fraud firm being named (vs. not named) for perpetrating the fraud is 42% higher if that executive has previously broken the law. We repeat this analysis by excluding the 14 fraud firms for which neither the CEO nor CFO is named to assure that results are not driven by omitted correlated variables associated with whether or not *any* executives are named. We also find a positive and significant (0.05 level) coefficient on *RECORD* in this reduced sample, indicating that the likelihood of a given CEO or CFO at a fraud firm being named for perpetrating the fraud is 25% higher if that executive has a prior record. In contrast, the coefficients on *FRUGAL* are insignificant in both models.

**** Insert Table 5 Panel B here ****

Collectively, the results in Tables 4 and 5 are consistent with the propensity channel for record holder CEOs: we document that fraud risk is elevated in firms run by CEOs with a prior record and such record holders are significantly more likely than non-record holders to be directly involved in fraud. In contrast, we find no evidence that an executive's frugality is associated with his propensity to commit fraud.

5. CEO type and the culture channel

5.1. Fraud and CEO named vs. CEO tenure

To examine by CEO type how the probabilities of fraud and of the CEO being named in fraud vary over the tenure of the CEO, we estimate the following fraud and CEO named models for four subsamples, namely, subsamples of CEOs with records, CEOs without records, frugal CEOs, and unfrugal CEOs:

$$FRAUD \text{ or } CEO\_NAMED = \alpha_0 + \alpha_1 \times TENURE + \alpha_2 \times TOBIN'S\_Q + \alpha_3 \times ROA + \alpha_4 \times \%IND\_FRAUD + \varepsilon. \quad (3)$$

Table 6 presents these results, along with *Z*-statistics for differences in α_1 (coefficient on *TENURE*) for the subsamples of CEOs with vs. without a record, and for subsamples of CEOs with high vs. low frugality. The relation between *FRAUD* and *TENURE* is insignificant for both record holder and non-record holder subsamples, and the difference in α_1 between these two subsamples is insignificant. Similar "non-results" are reported for the *CEO_NAMED* model except for a marginally *negative* relation between *CEO_NAMED* and *TENURE* in the subsample of record holders. The results in Table 6 do not provide evidence of a deterioration in the culture of firms run by record holders (culture channel).

**** Insert Table 6 here ****

In contrast, the results in Table 6 indicate that the relation between *FRAUD* and *TENURE* is negative and significant (at 0.05 level) for frugal CEOs and positive and significant (at 0.05 level) for unfrugal CEOs. The reported hazard ratios imply that the likelihood of fraudulent reporting declines by 6% per year over the tenure of frugal CEOs and increases by 6% per year over the tenure of unfrugal CEOs. The *Z*-statistic of -3.89 suggests that the difference between the two subsamples is significant at the 0.01 level. This supports the hypothesized erosion of corporate culture over the tenure of unfrugal CEOs, both in an absolute sense and relative to frugal CEOs. The probability that the CEO is named in fraud does not vary significantly over the tenure of frugal or non-frugal CEOs.

5.2. Other insiders named in fraud

We test whether the likelihood that other insiders are named in fraud varies with CEO type by estimating the following hazard model ("Others named model"):

$$OTHERS\_NAMED = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times FRUGAL + \alpha_3 \times TOBIN'S\_Q + \alpha_4 \times ROA + \alpha_5 \times \%IND\_FRAUD + \varepsilon. \quad (4a)$$

The dependent variable, *OTHERS_NAMED*, equals one if insiders other than the CEO were named by the SEC for perpetrating fraud in a given year, and zero for all other firm-years in the total sample.

We repeat the above models by including controls for media coverage, *F*-score, and governance quality.

A potential concern with this model is omitted correlated variables because we are not comparing executives *within* a firm (like our analysis of CEO-CFO pairs of fraud firms in Section 4). To identify the effect of CEO type on the probability that other insiders are named, we reestimate model (4a) using a seemingly unrelated bivariate probit model (biprobit). This model addresses the concern that the two outcomes (sorting of CEOs into firms and the occurrence of fraud) have correlated, unobservable determinants. The biprobit model produces a rho statistic that tests whether the sorting of CEOs by type into firms biases our misreporting model of interest. We use this model because both our dependent variable and our endogenous regressor are binary, meaning that instrumental variables ordinary least squares (IV OLS) and IV binary models should not be used. Nevertheless, we verify the robustness of our results across IV models.[29] We use cash as a proportion of total assets as our instrument for CEO frugality, based on the intuition that cash-rich firms would prefer to hire CEOs who are more restrained in their spending and place a greater emphasis on long-term strategic goals when making investment decisions. However, there is likely no direct association between cash assets and other insiders perpetrating fraud, except through the CEO type. The *F*-statistic indicates that a weak instrument is not a concern in this analysis.[30] Further, the rho statistic from the biprobit model suggests that it is unlikely that correlated omitted variables are driving our results. Our results are robust across the biprobit and hazard models.[31]

[29] We present the first-stage regression of both the IV and the biprobit models and the supporting statistics in the online Appendix. The *F*-statistics corresponding to the IV models further indicate that the instrument used is appropriate. We were unable to obtain a good instrument for *RECORD*, and could not conduct a biprobit analysis for this variable.

[30] Our results are robust to using research and development expense as a proportion of total assets as an instrument (we use this in subsequent models); however, in this model, cash as a proportion of total assets proves to be a stronger instrument.

[31] We perform analogous robustness checks for the fraud and CEO named analyses above and find similar results. However, we believe that the CEO-CFO matched pairs analysis reported in Section 4 is our most compelling identification strategy for the propensity channel.

We also examine by CEO type how the probability that other insiders are named in fraud varies over the tenure of the CEO by estimating the following model for four subsamples, namely, subsamples of CEOs with records, CEOs without records, frugal CEOs, and unfrugal CEOs:

$$OTHERS\_NAMED = \alpha_0 + \alpha_1 \times TENURE + \alpha_2 \times TOBIN'S\_Q + \alpha_3 \times ROA + \alpha_4 \times \%IND\_FRAUD + \varepsilon. \quad (4b)$$

Table 7, Panels A and B, present results for the Others named models (4a) and (4b). We report results corresponding to both the hazard and biprobit models in Panel A, but due to the similarity of the results, we discuss only those related to the hazard models.

**** Insert Table 7, Panel A and Table 7, Panel B here ****

The relation between *OTHERS_NAMED* and *RECORD* is insignificant in all models in Panel A, providing no evidence that the risk of other insiders perpetrating fraud increases with *RECORD* as would have been expected if CEOs with a record tend to oversee a relatively loose control environment. Further, the results in Panel B indicate that the probability that others are named *declines* marginally more over the tenure of CEOs with (vs. without) a record (Z = -1.76, significant at 0.10 level), opposite to the direction implied by a relative deterioration in the culture of firms run by record holders.

In contrast, Table 7, Panel A documents a negative and statistically significant relation between *OTHERS_NAMED* and *FRUGAL* in all models. The hazard ratio for *FRUGAL* in the base model (0.064 reported in column 1) implies that the probability that others are named for perpetrating fraud during the next year is 94% lower in firms run by frugal (vs. unfrugal) CEOs. This is consistent with the prediction that frugal CEOs run a relatively "tight ship." Further, Panel B documents that the probability that others are named in fraud *decreases* significantly over the tenure of frugal CEOs (0.05 level) and *increases* significantly over the tenure of unfrugal CEOs (0.10 level). The hazard ratio for *TENURE* of the frugal CEOs (0.389) implies that the probability that other insiders perpetrate fraud during the next year declines by about 61% a year over the tenure of frugal CEOs, while the corresponding hazard ratio for unfrugal CEOs (1.057) implies that the probability that other insiders

perpetrate fraud during the next year increases by about 6% a year over the tenure of unfrugal CEOs. The *Z*-statistic for the difference in tenure effect for frugal versus unfrugal CEOs (Z = -3.42) is significant (0.01 level), consistent with a relative weakening of the control environment during the reign of unfrugal (vs. frugal) CEOs. Collectively, the others named analyses reported in Table 7, Panels A and B, are consistent with the prediction that frugality is related to financial reporting risk through the culture channel.

5.3. Reporting errors

As further evidence of the relation between CEO type and corporate culture, we test whether the probability of reporting errors varies by CEO type (model (5a)), and how the relation between the probability of reporting errors and CEO tenure varies by CEO type (model (5b) estimated separately by CEO type):

$$ERROR = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times FRUGAL + \alpha_3 \times IC\_WEAKNESS + \varepsilon. \quad (5a)$$

$$ERROR = \alpha_0 + \alpha_1 \times TENURE + \alpha_2 \times IC\_WEAKNESS + \varepsilon. \quad (5b)$$

The dependent variable, *ERROR*, is an indicator variable that equals one in firm-years containing a material reporting error (identified by a subsequent restatement), and zero otherwise. *IC_WEAKNESS* is included to control for the inherent challenges to firms' internal control systems resulting from their business strategy. We estimate two additional versions of the above models, one using *IC_WEAKNESS_START* which is the internal control weakness estimated during the first year of the tenure of the CEO (as a proxy for the strength of the internal control system upon his appointment as CEO), and the other using the individual components used to estimate the probability of internal control weakness, namely, firm size, firm age, loss, foreign currency transactions, acquisition intensity, sales growth, restructurings, and number of segments. We reestimate model (5a) using a biprobit model in which we use R&D expense as a proportion of total assets as an instrument to control for potential selection of frugal executives into firms (see the online Appendix for the first-stage results

and supporting statistics suggesting the strength of the instrument used). Our instrument is based on the intuition that firms that have a longer-term focus, such as on growth through innovation, are more likely to hire frugal CEOs.[32]

Table 8, Panels A and B present the results of models (5a) and (5b), respectively. In Panel A we present all three specifications of the hazard and biprobit models. Panel A documents an insignificant relation between *ERROR* and *RECORD* in all models. Further, Panel B documents an insignificant relation between *ERROR* and *TENURE* for subsamples of CEOs with and without records. And the difference in the relation between *ERROR* and *TENURE* across these two subsamples is insignificant.

**** Insert Table 8, Panel A and Table 8, Panel B here ****

In contrast, as predicted, Panel A documents a significant negative relation between *ERROR* and *FRUGAL* in all models. The hazard ratio for *FRUGAL* in the base model (column 1) (0.58) implies that the probability of a material reporting error during the next year is approximately 41% lower in sample firms run by frugal (vs. unfrugal) CEOs, consistent with a relatively strong control environment in firms run by frugal CEOs. Moreover, Panel B documents that the probability of reporting errors *decreases* significantly (0.10 level) over the tenure of frugal CEOs by 2% per year, while it *increases* significantly (0.01 level) over the tenure of unfrugal CEOs by 12% a year. The *Z*-statistic (Z = -2.94) is significant at the 0.01 level, consistent with a relative increase in reporting risk over the tenure of unfrugal CEOs.

Collectively, the error analyses reported in Table 8, Panels A and B, are consistent with the prediction that frugal CEOs run a relatively tight ship, and that there is a significant deterioration in the control environment over the tenure of unfrugal CEOs relative to frugal CEOs. Consistent with all other tests above of the culture channel pertaining to *FRUGAL*, these results support the hypothesis that CEO frugality is linked to financial reporting risk through the culture channel. And consistent with

[32] We note that firms with more R&D are likely to be more complex, and errors are also more likely to occur in more complex firms. While we control for complexity through measures such as size and the number of business and geographic segments, we acknowledge that our instrument is limited to the extent these proxies do not completely capture firm complexity.

all other tests above of the culture channel pertaining to *RECORD*, the error analyses provide no evidence that CEOs' records are related to financial reporting risk through the culture channel.

5.4. Governance and the control environment

In our final analyses of the culture channel, we examine whether and how CEO type is associated with changes in the governance and control environment of their firms. We first estimate logit model (6a) to test whether the probability of appointing a CFO with a record or an unfrugal CFO varies by CEO type:

$$CFO\_RECORD \text{ or } CFO\_FRUGAL = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times FRUGAL + \alpha_3 \times SIZE + \alpha_4 \times ROA + \alpha_5 \times MTB + \alpha_6 \times ACQUISITION + \alpha_7 \times STD\_RET + \alpha_8 \times IND\_COMP\_CFO + \varepsilon. \quad (6a)$$

The control variables in model (6a) attempt to capture firm characteristics that might attract unfrugal CFOs or those with prior records, including firm size, growth, volatility, performance, and past acquisition intensity. We also include the median industry CFO compensation to control for the potential tendency for these CFOs to be attracted to higher paying industries.

Table 9, Panel A reports the results for model (6a). The probability of appointing a CFO with a record or a frugal CFO is not significantly related to whether the CEO has a record (*RECORD)*. However, the probability of appointing a CFO with a record is significantly lower if the CEO is frugal (0.05 level), and the probability of appointing a frugal CFO is significantly higher if the CEO is also frugal (0.05 level). Given the key role that CFOs play in financial reporting, the appointment of CFOs with a clean record and high frugality is consistent with the management of a tight control environment. Hence, the documented relations between the CFO appointments and *FRUGAL* support the prediction that frugal CEOs oversee a tight control environment relative to unfrugal CEOs, consistent with the culture channel.

**** Insert Table 9 Panel A here ****

We next examine whether CEO type is associated with changes in our other measures of corporate culture over the CEO's tenure. We estimate the following models for each of the corporate culture variables, including *DELTA*, *IC_WEAKNESS*, *%INDEP*, *SOCIAL*, and *DIR_SHARES:*

$$CORP\ CULTURE\ VARIABLE = \alpha_0 + \alpha_1 \times RECORD + \alpha_2 \times TENURE + \alpha_3 \times RECORD \times TENURE + Controls + \varepsilon. \quad (6b)$$

$$CORP\ CULTURE\ VARIABLE = \alpha_0 + \alpha_1 \times FRUGAL + \alpha_2 \times TENURE + \alpha_3 \times FRUGAL \times TENURE + Controls + \varepsilon. \quad (6c)$$

The control variables for each dependent variable are based on prior research (Bryan, Hwang, Klein, and Lilien, 2010; Coles, Daniel, and Naveen, 2005; Linck, Netter, and Yang, 2008; Dey and Liu, 2013).

Table 9, Panels B and C report the results for models (6b) and (6c), respectively. The results in Panel B provide no evidence that changes in the corporate culture over the tenure of CEOs is different for CEOs with vs. without records. In contrast, the results in Panel C indicate that *DELTA* and *SOCIAL* increase significantly (0.05 level) and *DIR_SHARES* decreases significantly (at 0.10 level) over the tenure of unfrugal CEOs (captured by the coefficient on *TENURE* in each model). Further, these changes are significantly less pronounced over the tenure of *frugal* CEOs (difference between the two groups captured by the coefficient on *FRUGAL* x *TENURE* in each model). These results are consistent with an increase in executives' equity-based incentives to misreport (as measured by high *DELTA*) and a decrease in board monitoring intensity (as evidenced by an increase in *SOCIAL* and a reduction in *DIR_SHARES*) under the reign of unfrugal CEOs in both absolute terms, and relative to frugal CEOs. While we cannot infer whether such changes are "suboptimal," they are likely to be associated with an increase in financial reporting risk over the tenure of unfrugal CEOs (in absolute terms and relative to frugal CEOs). Our other two measures of the culture, *IC_WEAKNESS* and *%INDEP*, do not vary significantly over the tenure of frugal or unfrugal CEOs.

**** Insert Table 9, Panel B and Table 9, Panel C here ****

Given our evidence of an association between CEO frugality and the control environment, we attempt to provide further insight into the culture channel by examining the extent to which the fraud vs. nonfraud years of the fraud sample can be explained by changes in *DELTA*, *SOCIAL*, and *DIR_SHARES* for the unfrugal and frugal CEOs. We also examine the extent to which fraud vs. nonfraud firm-years for the matched sample of fraud and nonfraud firms can be explained by *DELTA*, *SOCIAL*, *DIR_SHARES*, and CFO type (i.e., *CFO_RECORD* or *CFO_FRUGAL*). We focus on these measures of the corporate culture because of their significant changes over the tenure of unfrugal CEOs. We estimate the following model for corporate culture variables:

$$FRAUD = \alpha_0 + \alpha_1 \times FRUGAL + \alpha_2 \times CORP\ CULTURE\ VARIABLE + \alpha_3 \times FRUGAL \times CORP\ CULTURE\ VARIABLE + \alpha_4 \times TOBIN'S\_Q + \alpha_5 \times ROA + \alpha_6 \times \%IND\_FRAUD + \varepsilon. \quad (6d)$$

The results reported in the left half of Table 10 indicate that in fraud firms run by unfrugal CEOs, equity-based incentives of the top executives (*DELTA*) and social ties between independent directors and the CEO (*SOCIAL*) are significantly higher in fraud years than in nonfraud years (α_2 significantly > 0 at 0.05 and 0.01 levels, respectively). These effects are significantly less pronounced in fraud firms run by frugal CEOs (α_3 significantly < 0 at 0.10 and 0.05 levels, respectively). However, *DIR_SHARES* is not significantly different in the fraud vs. nonfraud years of fraud firms run by frugal or unfrugal CEOs.

The right half of Table 10 reports results based on the matched sample of fraud and nonfraud firms. In contrast to the results above, *DELTA* is no longer significantly related to *FRAUD* in firms run by unfrugal CEOs (and the interaction between *FRUGAL* and *DELTA* is no longer significant). However, in firms run by unfrugal CEOs, *CFO_FRUGAL* and *DIR_SHARES* are significantly negatively related to *FRAUD* (0.05 level) and (as before) *SOCIAL* is significantly positively related to *FRAUD* (0.01 level). And the latter two results are significantly less pronounced in firms run by frugal CEOs. Although we cannot infer causality, these results do suggest that in firms run by unfrugal

CEOs, there is an elevated fraud risk in firm-years with an unfrugal CFO and weak board monitoring (as measured by high *SOCIAL* and low *DIR_SHARES*).

**** Insert Table 10 here ****

The key results presented in this section can be summarized as follows. In firms run by unfrugal CEOs, fraud is significantly positively related to executives' equity-based incentives (*DELTA*) (for analysis based on fraud firms only), the presence of an unfrugal CFO (for analysis on pooled sample), and weak board monitoring (as measured by high *SOCIAL* (for both analyses) and low *DIR_SHARES* (for analysis based on pooled sample)). Further, all of these "fraud risk factors" increase significantly over the tenure of unfrugal CEOs in absolute terms and relative to corresponding changes over the tenure of frugal CEOs. Collectively, these results are consistent with the observed increase in the probabilities of fraud, other insiders being named in fraud, and reporting errors over the tenure of unfrugal CEOs, and provide support for the hypothesis that a culture characterized by a relatively loose control environment develops during the tenure of unfrugal CEOs. In contrast, we find little evidence of the culture channel for CEOs with records.

6. Sensitivity analyses[33]

6.1. Comparison to overconfidence, narcissism, risk-seeking, and religion

Our measures of CEO type may be capturing personal attributes that have been discussed in the literature, including overconfidence, narcissism, risk-seeking, and religion (e.g., Malmendier and Tate, 2005, 2008; Zweigenhaft and Marlowe, 1973; Jorgenson, 1977; Hilary and Hui, 2009). We examine whether our measures of executive type are related to these attributes. Data availability limits us to using one of the three measures of overconfidence from Malmendier and Tate (2005), whereby we classify CEOs as overconfident if they are habitual net acquirers of their firm's stock.[34] We measure

[33] The results of all our sensitivity analyses are presented in the online Appendix.

[34] We slightly modify their approach to increase the size of our sample. Whereas Malmendier and Tate (2005) exclude the first five years of a CEO's tenure and look at whether he is a net acquirer over the next five years, we exclude the first four years of a CEO's tenure and look at whether he is a net acquirer over the next

narcissism by the area covered by an executive's signature scaled by the number of letters in the name (hand-collected from SEC DEF 14A filings and 10-K reports) (Zweigenhaft and Marlowe, 1973; Jorgenson, 1977). We measure the risk-seeking nature of CEOs by examining whether they own motorcycles, and also by the risk-taking activities in their firms as measured by the research and development, capital expenditures, and acquisitions undertaken by these CEOs (Kothari, Laguerre, and Leone, 2002; Coles, Daniel, and Naveen, 2005; Biddle, Hillary, and Verdi, 2009). We follow Hilary and Hui (2009) in measuring religion, where we calculate the degree of religiosity of the county where the firm is headquartered as a proxy for the likelihood that the CEO is a member of a religious institution. Specifically, we measure religiosity as the the number of religious adherents as a proportion of the total population in each county. We are able to compute the overconfidence measure for 76 firms, the narcissism measure for 70 firms, and risk-seeking and religiosity measures for our full sample of 218 fraud and nonfraud firms.[35]

We find that these measures of CEO overconfidence, narcissism, and risk-seeking are not significantly correlated with our measures of CEO type, but religion is positively correlated with our measures of CEO type, i.e., *RECORD* and *FRUGAL*. This indicates that more religious counties have more frugal CEOs, but more CEOs with criminal records as well. Next, we reestimate our base fraud and CEO named models, including measures of CEO overconfidence, narcissism, risk-seeking, and religion as control variables. The main effect of *RECORD* continues to be positive and significant and *FRUGAL* continues to be insignificant (except in the model with overconfidence as a control, where it is negative and significant at the 0.01 level, suggesting that the incidence of fraud is less likely in companies run by frugal CEOs). The proxies for CEO narcissism and risk-seeking are not statistically significant, while CEO overconfidence and religion are significantly positive (at 0.05 and 0.01 levels, respectively) in the fraud model.

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four years. This modification increases the number of CEOs for which we can calculate the measure from 40 to 76.

[35] We note that a caveat in these analyses is the limited data we have on CEO overconfidence and narcissism.

6.2. CEO type and earnings management

In our final analysis, we attempt to analyze further whether the observed relation between fraud and CEO type is driven by SEC detection and enforcement procedures, rather than the occurrence of misreporting. We investigate the relation between CEO type and proxies for less egregious forms of earnings management that are not subject to this concern. We conduct this analysis on our sample of fraud and non-fraud firms. We only consider quarters after the CEO in question assumes his position up until the year that the fraud is initiated (the corresponding year for the matched non-fraud firm).

Our primary measure of earnings management is the percentage of the previous eight quarters that a firm exactly meets or beats the most recent consensus analysts' forecast by one cent (*MEET_BEAT*). Our results are robust to using other proxies for earnings management from prior research, including measures of accruals quality and discretionary accruals calculated using the modified Jones (1991) model (Dechow, Sloan, and Sweeney, 1995).[36]

We test the association between *MEET_BEAT* and CEO type using OLS regression and verify that the results are robust to using an IV model with research and development as a proportion of assets as our instrument for CEO frugality.[37] However, as before, we fail to find a good instrument for CEO record. Consistent with our fraud analysis, we find a significant and positive coefficient for *RECORD* (0.05 level or better), i.e., a company run by a CEO with a record is associated with an increase in the percentage of quarters when it meets or beats the consensus analysts' forecast. These results provide additional assurance of a connection between executives' prior legal infractions and earnings manipulation. We also find a significant and negative coefficient on the *FRUGAL* variable (0.10

[36] These measures of earnings management are controversial, including concerns with the potential for correlated omitted variables and measurement error [see Dechow, Ge, and Schrand (2010) for a discussion of the pros and cons for using these measures]. Therefore, our results should be interpreted with these drawbacks in mind. Mindful of the limitation of empirical proxies, we rely heavily on the established research in our choice of these proxies. We note that these tests are necessarily joint tests of whether manipulation of reported earnings is associated with CEO type and the validity of the earnings management proxies.

[37] The results of these earnings management analyses are consistent across the full sample, and the fraud and non-fraud subsamples.

level), but only for the IV model, indicating that a frugal CEO is associated with a decrease in the percentage of quarters when the firm meets or just beats the consensus analysts' forecast.

7. Summary and conclusions

We examine how and why two aspects of top executives' behavior outside the workplace, legal infractions and ownership of luxury goods, are related to the likelihood of materially misstated financial statements. Based on a sample of fraud and matched non-fraud firms, we document that CEOs (and CFOs) with prior legal infractions have a relatively high propensity to perpetrate fraud (i.e., named in the fraud), but no evidence that such CEOs are associated with a corporate culture characterized by a relatively weak or deteriorating control environment.

In contrast, we find no relation between the frugality of executives (as measured by their ownership of luxury goods) and their propensity to perpetrate fraud. However, consistent with a weakening of the control environment, we find a relative increase in financial reporting risk over the tenure of unfrugal CEOs as reflected by the probabilities of fraud, others being named in fraud, and material reporting errors. Further, the increase in fraud risk over the tenure of unfrugal CEOs is related to changes in several aspects of the corporate culture, including an increase in executives' equity-based incentives, a decrease in measures of board monitoring, and the appointment of an unfrugal CFO.

Our paper is subject to several limitations. First, our sample size is necessarily small and nonrepresentative of the underlying population with respect to the proportion of firms with fraud and material reporting errors. Second, our fraud and error samples include only cases of fraudulent and erroneous reporting that are detected and enforced. We address this concern in several ways. In our fraud analyses, we use a propensity score matched sample of fraud and control firms, and test the robustness of results to the inclusion of a variety of control variables for firm and executive visibility and other attributes that may affect detection and enforcement. Second, as our most compelling identification strategy for isolating the propensity channel, we find robust results when we analyze the relation between executive type and the likelihood that the executive is named in fraud using CEO and

CFO pairs from 75 fraud firms (holding constant all non-executive-level factors for each CEO-CFO pair). Third, as an additional identification strategy for the propensity channel, we examine the relation between CEO type and both *intentional* (fraud and CEO being named in fraud) and *unintentional* misreporting (errors). As expected, the probability of fraud and the CEO being named in fraud is elevated in firms run by CEOs with a record and the probability of errors is not. Fourth, as our most compelling identification strategy for isolating the culture channel, we examine *changes* in the prevalence of misreporting over the tenure of the CEO by CEO type, and link these to *changes* in specific aspects of the control environment. Finally, we examine the relation between CEO type and a measure of less egregious earnings management unaffected by SEC detection and enforcement procedures. Nevertheless, our interpretation of results as evidence of misreporting, per se, remains subject to this important caveat.

Third, endogenous sorting of executives to firms may bias our results. Our identification strategies above, as well as the robustness of results to our instrument for executive frugality mitigate, but do not eliminate, this concern.

Subject to these caveats, we provide evidence that the probability of materially misstated financial statements varies in an intuitive and intriguing way with executives' off-the-job behavior, adding to our understanding of financial reporting risk. We also provide new evidence of how changes in several dimensions of the corporate culture over the tenure of the CEO differ by CEO type. Our results suggest that our novel measures of executive type (*RECORD* and *FRUGAL*) capture meaningful variation in managerial "style" in a financial reporting context, suggesting that these measures may be useful in exploring other aspects of corporate behavior and performance.

Our study lays the groundwork for additional future research. For example, is the behavior of unfrugal (i.e., materialistic) executives more responsive to financial incentive packages? Do the effects of board monitoring depend on the type of executives being monitored? Does director type "matter"? Are the prior legal infractions and ownership of luxury goods by politicians related to their stewardship of taxpayers' money?

Appendix. Definition of variables and data sources

Category	Variable	Measurement	Data source
Board monitoring variables	Board independence. (*%INDEP*)	The proportion of the board that is independent. An independent director is defined as a director who is not an employee of the firm, does not have any business transactions with the firm, has no family ties with the employees of the firm, and has no other interlocking relationships with the firm.	RiskMetrics plus hand-collection from SEC DEF 14A filings
	Social connections between CEO and director. (*SOCIAL*)	A dummy variable that equals one if the CEO is socially connected to any of the independent directors on the board. Social connections between CEOs and directors include mutual alma maters, worked in the same company/ companies in the past, served in the military together, are currently members of the same clubs as the CEO, serve in the same charitable or belong to other non-professional organizations as the CEO.	BoardEx
	The stock-based compensation of a director. (*DIR_SHARES*)	The median number of shares of stock for independent directors as a proportion of total outstanding shares of the firm.	RiskMetrics plus hand-collection from SEC DEF 14A filings
Firm variables	Accounting fraud. (*FRAUD*)	A dummy variable that equals one in the years a firm committed accounting fraud and had an AAER issued against it by the SEC.	SEC AAERs
	Accounting errors. (*ERROR*)	A dummy variable that equals one for the years a firm had a material clerical error in reported numbers and had to issue a restatement due to this error.	Audit Analytics
	Firm size. (*SIZE)*	The logarithm of the market capitalization of the firm as of the year prior to the initiation of fraud (or the corresponding year for the control firm).	Compustat
	Growth opportunities. (*MTB*)	The market value of equity divided by the book value of equity measured at the end of the year prior to the initiation of fraud (or the corresponding year for the control firm).	Compustat
	Firm value. (*TOBIN'S_Q*)	The prior year's market value of assets divided by the book value of assets.	Compustat
	Operating performance. (*ROA*)	The prior year's operating income before depreciation divided by the firm's average total assets, less the industry median return on assets using the Fama-French five-industry definition.	Compustat
	Leverage. (*LEVERAGE*)	The total debt divided by the book value of the equity measured in the year prior to the initiation of fraud (or the corresponding year for the control firm).	Compustat
	Analyst following of the firm. (*ANALYST_FOLL*)	The number of analysts issuing forecasts for the firm.	I/B/E/S

Appendix (Cont.)

Category	Variable	Measurement	Data source
Firm variables	Media coverage of the CEO/firm. (*MEDIA_FIRM; MEDIA_CEO*)	The number of media documents which include the firm's name in a given year (or the number of media articles on a CEO in a given year).	News articles and press releases from Factiva
	Prevalence of fraud by industry. (*%IND_FRAUD*)	The number of fraud firms in the firm's two-digit SIC code divided by the total number of firms in that two-digit SIC code that year.	SEC AAERs
	The *F*-Score for a firm. (*FSCORE*)	The output from the predictive model (Model (1)) for accounting manipulations reported in Dechow, Ge, Larson, and Sloan (2011).	Compustat
	Internal control weakness. (*IC_WEAKNESS; IC_WEAKNESS_START*)	The fitted score using a modified version of the model in Doyle, Ge, and McVay (2007). We exclude SPEs due to data limitations. We also consider this variable measured as of the first year of the CEO's tenure.	Compustat and CRSP
	Age of the firm. (*FIRM_AGE*)	The natural logarithm of the age of the firm, measured as the number of years the firm is on CRSP.	CRSP
	Net income or loss. (*NET_INCOME*; *LOSS*)	Net income is the seasonally adjusted income before extraordinary items. Net loss is measured by a dummy variable that equals one if net income is negative in the current quarter. Net loss in a prior quarter q is represented with a subscript (t-q).	Compustat
	Foreign currency transactions. (*FOREIGN*)	A dummy variable that equals one if the firm has foreign currency transactions.	Compustat
	Acquisition intensity. (*ACQUISITION*)	The sum of expenditures for acquisitions over the past two years scaled by the market capitalization of the prior year.	Compustat
	Extreme sales growth. (*SALES_GROWTH*)	A dummy variable that equals one if the industry-adjusted growth in sales over the last year is in the top quintile.	Compustat
	Restructuring charges. (*RESTRUCTURE*)	The sum of restructuring charges over the past two years scaled by the market capitalization of prior year.	Compustat
	The number of segments. (*LSEGMENTS*)	The natural logarithm of the number of operating and geographic segments.	Compustat
	Cash. (*CASH*)	The amount of cash as a proportion of total assets.	Compustat
	Research and development. (*R&D*)	The total research and development expenses as a proportion of total assets.	Compustat
	Standard deviation of returns. (*STD_RET*)	The standard deviation of monthly stock returns calculated over the year prior to the initiation of fraud (or the corresponding year for the control firm).	CRSP
	Meeting or beating analysts' forecasts. (*MEET_BEAT*)	The percentage of last eight quarters that a firm meets or beats (by one cent) the most recent median consensus analysts' forecast.	I/B/E/S and Compustat
	Current asset intensity. (*CURRENT_ASSET*)	Current assets as a proportion of total assets.	Compustat
	Governance quality. (*GOVSCORE*)	An overall governance score ranging from one to one hundred developed by Governance Metrics International (GMI), with higher values representing better governance. This score is based on various accounting (including regulatory violations, financial statement, and earnings data) and governance information.	Governance Metrics International

Appendix (Cont.)

Category	Variable	Measurement	Data source
Executive variables	Legal infractions of an executive. (*RECORD*)	A dummy variable that equals one if a CEO had any legal infraction prior to the fraud initiation year (or the corresponding year for the control firm), and zero otherwise. Legal infractions include driving under the influence, other drug-related charges, domestic violence, reckless behavior, disturbing the peace, and traffic violations (including speeding tickets).	Find Out the Truth.com (FOTT)
	Luxury asset ownership by an executive. (*FRUGAL*)	A dummy variable that equals one if an executive does not own any luxury assets prior to the fraud initiation year (or the corresponding year for the matched control firm), and zero otherwise. Luxury assets include cars costing more than $75,000, boats greater than 25 feet in length, primary residences worth more than twice the average of the median home prices in the zip codes within 15 miles of the corporate headquarters, and additional residences or vacation homes worth twice the average home prices in that metropolitan area as defined by the Core Based Statistical Area (CBSA).	Find Out the Truth.com (FOTT)
	Executive named in a fraud case. (*NAMED_EXEC; OTHERS_NAMED*)	Dummy variables that equal one if the CEO, CFO, or any other executives/directors/employees are named by the SEC as being responsible in perpetrating the fraud.	SEC AAERs
	The age of the CEO. (*CEO_AGE*)	The age of the CEO measured in the year of the initiation of fraud (or the corresponding year for the matched control firm).	ExecuComp/Boardex
	The delta of the CEO's wealth. (*CEO_DELTA*)	The dollar change in the value of a CEO's stock and option portfolio for a 1% change in stock price.	ExecuComp
	Wealth of the CEO. (*WEALTH*)	The logarithm of the fair value of the CEO's wealth derived from stock and options from the firm plus other compensation received over the previous three years, using the option valuation model in Core and Guay (2002).	ExecuComp
	Tenure of the CEO. (*TENURE*)	The number of years the CEO has worked in his/her current position.	ExecuComp/Boardex
	Perquisites received by the CEO. (*PERKS*)	The average value of all perquisites received by the executive over the three years leading up to the event year.	SEC DEF 14A filings
	Overconfidence. (*OVERCONFIDENCE*)	A dummy variable that equals one if the CEO is considered overconfident, based on whether the executive is a net acquirer of shares (Malmendier and Tate, 2005). We modify the measure as net purchases after the 4th year of tenure over the next four years in order to obtain sufficient observations.	ExecuComp
	Narcissism. (*NARCISSISM*)	The area covered by a CEO's signature scaled by the number of letters in his/her name.	SEC DEF 14A filings and 10K reports
	Religion. (*RELIGION*)	The number of religious adherents as a proportion of the total population in the county in which the firm is headquartered, based on the number of members in each religious institution in each county.	American Religion Data Archive and US Census Bureau
	Industry CFO compensation. (*IND_COMP_CFO*)	The median two-digit industry total compensation received by CFOs.	ExecuComp

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Table 1

Fraud sample selection

This table describes the selection of the final fraud sample from the Securities and Exchange Commission Accounting and Auditing Enforcement Releases through 2010, including the number of fraud firms.

Total AAERs	3148
AAERs not involving accounting fraud and redundant AAERs	2298
Total accounting fraud AAERs	852
Cases of options backdating	24
Cases of asset/revenue understatement	4
Number of fraud cases	824
Firms without CRSP identifiers	329
Firms with CRSP identifiers but no data to calculate lagged returns	190
Firms without Compustat identifiers/data	34
Number of fraud cases with CRSP & Compustat data	271
Firms without required compensation data on ExecuComp or executive data from FindOutTheTruth.Com	162
Final sample	109
Average duration of fraud	2.50 years
Median duration of fraud	2 years
Shortest case	1 quarter
Longest case	13 years

Fig. 1. Legal infractions by firm type.

Figure 1 displays the number of legal infractions by category committed by CEOs in the fraud firm CEO and non-fraud firm CEO samples.

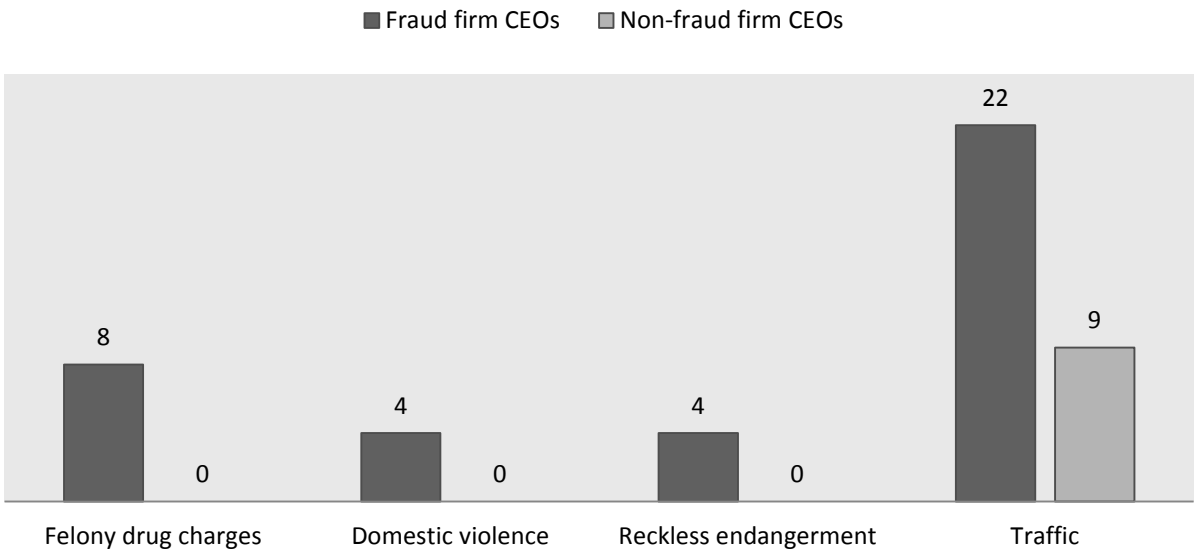

Fig. 2. Asset ownership by firm type.

Figure 2 displays the number of assets by category owned by CEOs in the fraud firm CEO and non-fraud firm CEO samples.

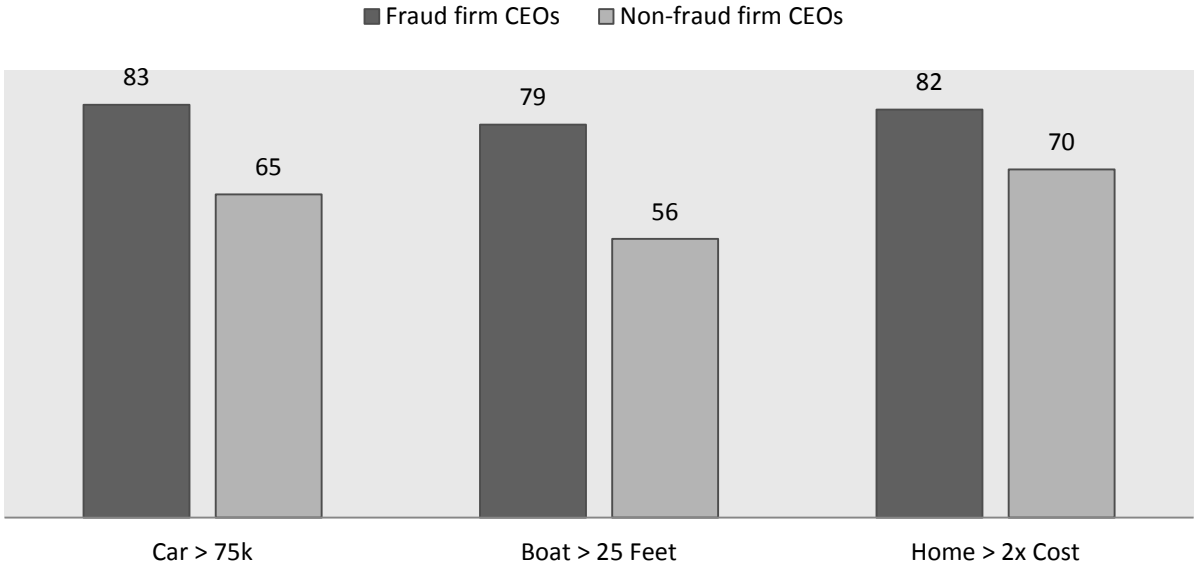

Fig. 3. Legal infractions (percentage) by firm type.

Figure 3 displays the percentage of CEOs who have committed legal infractions in the listed categories in the error firm CEO and non-error firm CEO samples.

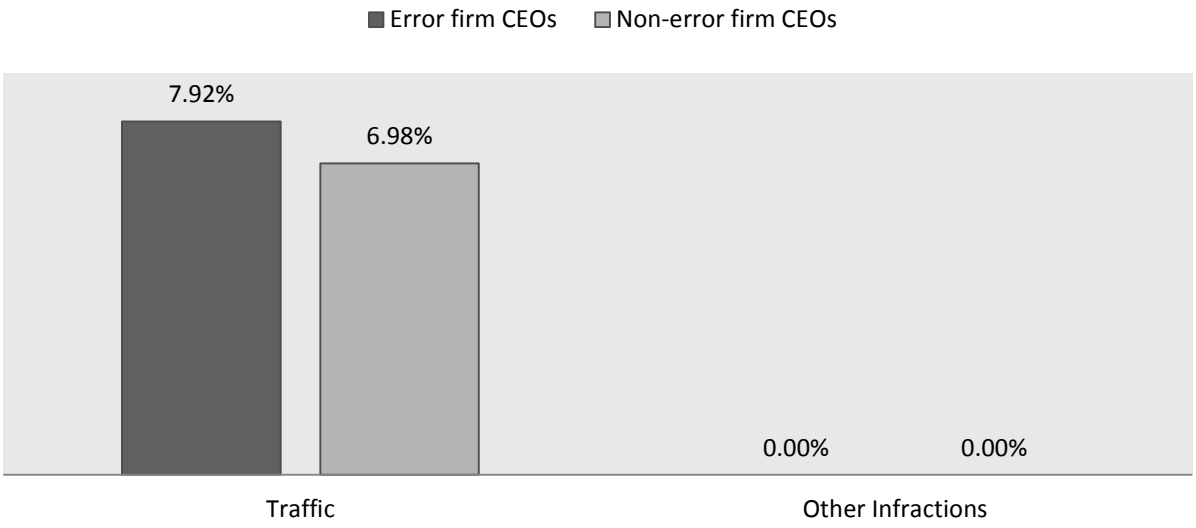

Fig. 4. Asset ownership (percentage) by firm type.

Figure 4 displays the percentage of CEOs who own assets in the listed categories in the error firm CEO and non-error firm CEO samples.

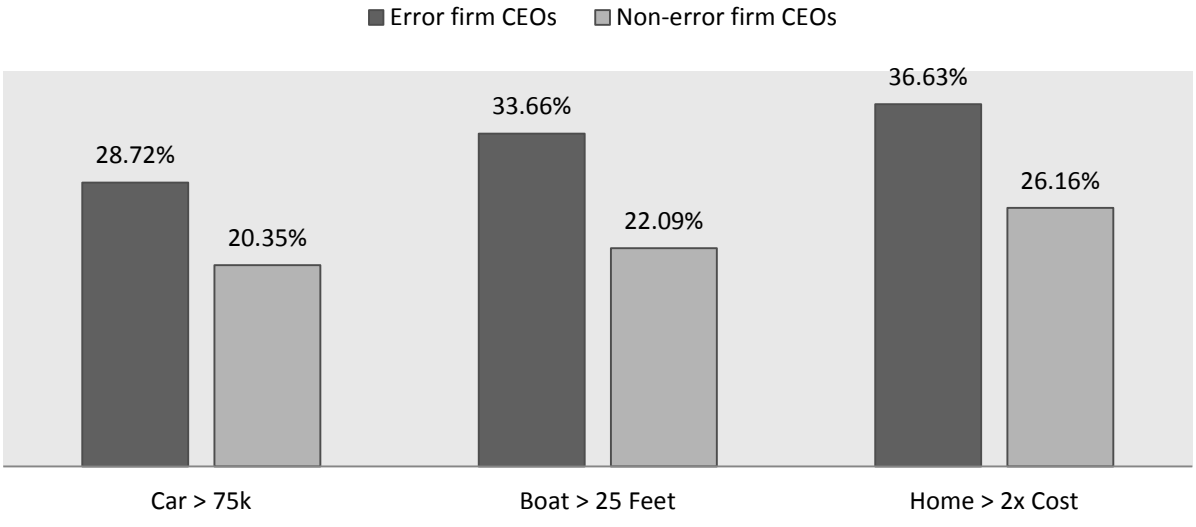

Table 2

Summary of CEO prior legal records and luxury asset ownership data

Table 2 presents the composition of data on CEOs' legal infractions and asset ownership for the fraud, non-fraud, error, and non-error samples. We note that while we present the raw numbers of legal infractions and assets for the fraud and non-fraud samples, we present percentages (of total firms in sample) for the error and non-error samples due to different sample sizes. *T*-tests are conducted for differences in means between the fraud/non-fraud firms and error/non-error firms.

	FRAUD FIRMS (N = 109)	CONTROL NON-FRAUD FIRMS (N = 109)	ERROR FIRMS (N = 94)	CONTROL NON-ERROR FIRMS (N = 179)
	Number	*Number*	*%*	*%*
Prior legal infractions of CEOs				
CEOs with prior legal infractions	22***	5	8%	7%
All legal infractions	38***	9	13%	8%
CEOs with serious legal infractions (Domestic violance, reckless behaviors, DUI, drug-related charges)	12***	0	0%	0%
Serious legal infractions	16***	0	0%	0%
Luxury asset ownership of CEOs				
Frugal CEOs	42*	56	35%**	53%
Unfrugal CEOs	67*	53	65%**	47%
Cars worth more than $75,000	83*	65	29%*	20%
Boats	79*	56	34%**	22%
Homes worth more than twice the average of median home prices of neighboring zip codes	82	70	37%**	26%

***Significant at the 1% level; **5% level; *10% level.

Table 3

Descriptive statistics for fraud and error firms

Table 3 presents the mean, median, and standard deviations of the board, firm, and CEO characteristics over all sample years for the fraud / non-fraud samples and the error / non-error samples, respectively. The significance of *t*-tests of differences in means and Wilcoxon/Chi-square tests of differences in medians are presented next to the corresponding variables for the control samples. All variables are defined in the Appendix.

	FRAUD FIRMS			MATCHED CONTROL FIRMS		
	MEAN	MEDIAN	STD. DEV.	MEAN	MEDIAN	STD. DEV.
% INDEP	76.68	78.17	11.77	75.10	77.78	13.20
SOCIAL	0.61	1.00	0.49	0.39***	0.00***	0.49
DIR_SHARES	0.17	0.02	0.79	0.14	0.03	0.59
GOVSCORE	51.23	54	18.99	59.61***	61.50***	16.86
SIZE	7.05	6.90	2.10	7.09	6.98	1.84
MTB	1.70	0.95	2.45	1.47*	1.03	1.61
TOBIN'S_Q	2.62	1.89	2.41	2.49	2.04*	1.65
ROA	0.05	0.04	0.11	0.06	0.04	0.12
ANALYST_FOLL	15.01	12.00	10.49	12.75***	11.00**	8.97
MEDIA_FIRM	355	85	693	184***	80***	395
%IND_FRAUD	0.38	0.19	0.61	0.53***	0.25***	0.94
FSCORE	1.88	1.39	2.57	1.44***	1.23***	1.02
IC_WEAKNESS	-0.65	-0.69	0.41	-0.71**	-0.74**	0.39
CEO_AGE	66.35	67.00	7.99	66.92	68.00	8.490
CEO_DELTA	1,361,891	185,033	3,713,810	682,932	134,990	1,973,682
WEALTH	17.41	17.02	1.92	16.98***	16.88***	1.75
TENURE	8.17	7.00	6.14	10.68***	9.00**	8.02
PERKS	9,675	0.00	3,438	9,231	0.00	45,311
OVERCONFIDENCE	0.76	1.00	0.43	0.64**	1.00	0.48
NARCISSISM	58.63	52.50	31.96	63.75	48.29	44.53
RELIGION	55.73	55.11	11.94	49.93***	48.33***	10.58
MEDIA_CEO	13.70	5.00	36.06	9.84**	4.00**	34.08
	ERROR FIRMS			CONTROL FIRMS		
	MEAN	MEDIAN	STD. DEV.	MEAN	MEDIAN	STD. DEV.
IC_WEAKNESS	-0.61	-0.64	0.36	-0.76***	-0.80***	0.39
IC_WEAKNESS_START	-0.41	-0.39	0.44	-0.64***	-0.68***	0.42
SIZE	6.59	6.55	1.43	7.50***	7.38***	1.87
FIRM_AGE	2.18	2.08	1.22	2.96***	3.09***	0.88
LOSS	0.21	0.00	0.41	0.13***	0.00***	0.34
FOREIGN	0.13	0.00	0.11	0.23***	0.00***	0.42
ACQUISITIONS	0.05	0.00	0.14	0.07**	0.00	0.21
SALES_GROWTH	0.33	0.00	0.47	0.24***	0.00	0.42
RESTRUCTURE	0.01	0.00	0.03	0.01	0.00	0.03
LSEGMENTS	0.84	0.69	0.52	1.03***	0.69	0.64
TENURE	9.35	7	8.62	8.78*	7	7.44

***Significant at the 1% level;

Table 4
FRAUD vs. CEO type

Table 4 presents the results of the hazard models examining the relation between fraud and CEO type (*RECORD* and *FRUGAL*). All variables are defined in the Appendix.

	DEPENDENT VARIABLE = FRAUD					
	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)
RECORD	2.214***	1.985***	2.590***	1.980***	2.351***	2.136***
	(4.25)	(3.61)	(4.34)	(3.33)	(3.91)	(3.43)
FRUGAL	0.913	0.924	0.892	1.059	0.816	0.805
	(-0.49)	(-0.46)	(-0.57)	(0.28)	(-0.92)	(-0.93)
TOBIN'S_Q	1.044*	0.986	1.015	1.005	1.03	0.984
	(1.73)	(-0.46)	(0.56)	(0.17)	(1.11)	(-0.48)
ROA	1.014	1.014	1.010	1.018*	1.011	1.003
	(1.54)	(1.64)	(1.16)	(1.74)	(1.22)	(0.43)
%IND_FRAUD	1.064	0.981	0.958	1.066	1.058	0.932
	(0.73)	(-0.17)	(-0.41)	(0.59)	(0.60)	(-0.57)
MEDIA_FIRM		1.038***				
		(4.33)				
WEALTH			1.001			
			(1.10)			
PERKS				1.056***		
				(4.41)		
FSCORE					1.064**	
					(2.24)	
GOVSCORE						0.980***
						(-3.67)
PSEUDO *R*2	0.09	0.10	0.10	0.12	0.08	0.14
NO. OF OBS	1,703	1,062	1,141	679	1,095	725

***Significant at the 1% level; **5% level; * 10% level. Standard errors are clustered by firm.

Table 5

Analysis of propensity channel

Panel A: Analysis with matched sample of fraud & non-fraud firms: CEO_NAMED vs. CEO Type

Panel A presents the results of the hazard models examining the relation between CEO type (*RECORD* and *FRUGAL*) and his/her being named by the SEC for perpetrating fraud. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = CEO_NAMED					
	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)	HAZARD (*Z*)
RECORD	7.471***	8.140***	8.831***	7.131***	6.245***	6.566***
	(6.81)	(7.04)	(6.49)	(5.91)	(5.31)	(5.28)
FRUGAL	1.394	1.608	1.327	1.389	1.157	1.027
	(1.10)	(1.51)	(0.87)	(0.94)	(0.42)	(0.08)
TOBIN'S_Q	1.068**	1.035	1.054	1.032	1.045	0.997
	(2.32)	(1.28)	(1.60)	(1.08)	(1.36)	(-0.08)
ROA	1.011	1.016	1.007	1.024*	1.011	1.003
	(0.93)	(1.31)	(0.58)	(1.93)	(0.87)	(0.28)
%IND_FRAUD	0.920	0.787*	0.737	0.868	0.849	0.809
	(-0.55)	(-1.66)	(-1.21)	(-0.59)	(-1.01)	(-1.44)
MEDIA_CEO		2.148***				
		(4.78)				
WEALTH			1.001			
			(0.64)			
PERKS				1.088***		
				(6.62)		
FSCORE					1.045	
					(1.42)	
GOVSCORE						0.966***
						(-3.82)
PSEUDO *R*2	0.46	0.47	0.47	0.42	0.48	0.54
NO. OF OBS	1,703	1,062	1,141	679	1,095	725

***Significant at the 1% level; **5% level; * 10% level. Standard errors are clustered by firm.

Panel B: Analysis with CEO-CFO pairs of fraud firms: NAMED_EXEC vs. CEO type

Panel B presents the results of logit models examining the relation between the record and frugality variables for the CEOs and CFOs in the fraud sample and whether or not the executive is named as a perpetrator of the fraud. The first two columns present the log odds ratios and marginal effects for all fraud firms, and the next two columns present the log odds ratios and marginal effects for only those fraud firms where at least one executive was named. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = NAMED_EXEC			
	75 FRAUD FIRMS		FIRMS WITH AT LEAST ONE NAMED EXECUTIVE	
	COEF. (*Z*)	MARGINAL EFFECTS	COEF. (*Z*)	MARGINAL EFFECTS
INTERCEPT	-0.446*		0.375	
	(-1.71)		(1.03)	
RECORD	1.314**	0.423***	1.346**	0.250***
	(2.43)	(6.05)	(2.31)	(2.56)
FRUGAL	0.226	0.082	0.605	0.112
	(0.66)	(1.08)	(0.87)	(0.93)
MEDIA_EXEC	-0.002	-0.001	-0.001	-0.001
	(-0.83)	(-0.79)	(-0.12)	(-0.12)
PSEUDO *R*2	0.04		0.06	
NO. OF EXECUTIVES	150		122	
NO. OF FIRMS	75		61	

***Significant at the 1% level; **5% level; * 10% level. Standard errors are clustered by firm.

Table 6

Analysis of culture channel: FRAUD and CEO_NAMED vs. CEO tenure by CEO type

Table 6 presents the results for hazard models examining the relation between CEO tenure and fraud for the four CEO type subsamples. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = FRAUD				DEPENDENT VARIABLE = CEO_NAMED			
	RECORD	NO RECORD	FRUGAL	UNFRUGAL	RECORD	NO RECORD	FRUGAL	UNFRUGAL
	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)
TENURE	0.910	0.987	0.941**	1.06**	0.870*	0.998	0.963	1.051
	(-1.59)	(-0.61)	(-2.17)	(1.96)	(-1.81)	(-0.04)	(-1.00)	(0.80)
TOBIN'S_Q	0.984	1.057*	1.034	1.256***	1.048	1.069*	1.061*	1.295**
	(-0.22)	(1.81)	(1.24)	(2.74)	(0.59)	(1.84)	(1.86)	(2.14)
ROA	1.007	1.015	1.106	0.996	1.011	1.012	1.007	0.995
	(0.21)	(1.52)	(1.30)	(-0.27)	(0.34)	(0.93)	(0.48)	(-0.33)
%IND_FRAUD	1.095	1.028	1.099	1.188	0.99	0.63	1.124	0.919
	(0.41)	(0.26)	(0.99)	(0.97)	(-0.04)	(-1.00)	(0.86)	(-0.20)
Z-STATISTICS:								
RECORD ≠ NO RECORD		-1.08				-0.06		
FRUGAL ≠ UNFRUGAL			-3.89***				-2.10**	
PSEUDO *R*2	0.02	0.07	0.07	0.25	0.48	0.11	0.10	0.25
NO. OF OBSERVATIONS	206	1,497	906	797	206	1,497	906	797

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.

Table 7
Analysis of culture channel
Panel A: OTHERS_NAMED vs. CEO type

Panel A presents the results of the hazard and bivariate probit models examining the relation between CEO type and insiders other than the CEO being named by the Securities and Exchange Commission for perpetrating the fraud. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = OTHERS_NAMED							
	HAZARD	BIPROB	HAZARD	BIPROB	HAZARD	BIPROB	HAZARD	BIPROB
	HAZARD (*Z*)	COEF. (*Z*)	HAZARD (*Z*)	COEF. (*Z*)	HAZARD (*Z*)	COEF. (*Z*)	HAZARD (*Z*)	COEF. (*Z*)
RECORD	0.564	-3.809	0.451	-0.317	0.878	-0.074	1.007	0.069
	(-0.94)	(0.01)	(-1.38)	(-1.00)	(-0.23)	(-0.23)	(0.01)	(0.21)
FRUGAL	0.064***	-2.054**	0.073***	-1.174**	0.099***	-1.021*	0.086***	-1.631**
	(-3.27)	(-2.04)	(-3.26)	(-2.26)	(-2.73)	(-1.90)	(-3.03)	(-2.22)
TOBIN'S_Q	1.120**	0.048	1.094*	0.042	1.076	0.037	0.931	-0.023
	(1.97)	(0.56)	(1.68)	(1.07)	(1.19)	(0.97)	(-0.42)	(-0.32)
ROA	1.001	-0.007	0.996	-0.003	1.002	-0.001	0.973	-0.008
	(0.03)	(-0.79)	(-0.28)	(-0.31)	(0.18)	(-0.09)	(-1.54)	(-0.84)
%IND_FRAUD	1.252	0.087	1.364	0.141	1.193	0.090	1.001	-0.018
	(1.36)	(0.78)	(1.44)	(1.00)	(0.86)	(0.68)	(0.01)	(-0.13)
MEDIA_FIRM			0.958	-0.014				
			(-0.86)	(-0.67)				
FSCORE					1.128	0.033		
					(0.69)	(0.70)		
GOVSCORE							0.988*	-0.005
							(-1.91)	(-0.83)
RHO STATISTIC		0.80		0.08		0.06		0.48
CHI SQUARE		0.70		0.03		0.02		0.83
P-VALUE		0.40		0.86		0.88		0.36
PSEUDO *R*2	0.55		0.52		0.47		0.55	
NO. OF OBSERVATIONS	1,703	1,661	1,062	1,062	1,095	1,060	725	724

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.

Panel B: OTHERS_NAMED vs. CEO tenure by CEO type

Panel B presents the results for hazard models examining the relation between CEO tenure and insiders other than the CEO being named by the SEC for perpetrating the fraud for the four CEO type subsamples. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = OTHERS_NAMED			
	RECORD	NO RECORD	FRUGAL	UNFRUGAL
	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)
TENURE	0.908	0.976	0.389**	1.057*
	(-1.54)	(-0.48)	(-2.33)	(1.84)
TOBIN'S_Q	0.257	1.051	0.812	1.202
	(-1.51)	(1.00)	(-0.73)	(1.54)
ROA	1.062	1.009	0.974	1.001
	(0.57)	(0.73)	(-1.14)	(0.03)
%IND_FRAUD	0.742	1.178	2.396	1.288
	(-0.90)	(0.80)	(1.43)	(1.11)
Z-STATISTICS:				
RECORD ≠ NO RECORD		-1.76*		
FRUGAL ≠ UNFRUGAL				-3.42***
PSEUDO *R*2	0.23	0.24	0.59	0.40
NO. OF OBSERVATIONS	206	1,497	906	797

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.

Table 8
Analysis of culture channel
Panel A: ERROR vs. CEO type

Panel A presents the results for hazard and bivariate probit models examining the relation between CEO type and errors. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = ERROR					
	HAZARD	BIPROB	HAZARD	BIPROB	HAZARD	BIPROB
	H. RATIO (*Z*)	COEF. (*Z*)	H. RATIO (*Z*)	COEF. (*Z*)	H. RATIO (*Z*)	COEF. (*Z*)
RECORD	1.301	0.088	0.944	-0.027	1.055	0.013
	(0.60)	(0.48)	(-0.13)	(-0.21)	(0.11)	(0.07)
FRUGAL	0.578**	-1.608*	0.611**	-2.157***	0.599**	-0.981**
	(-2.15)	(-1.97)	(-2.11)	(-4.80)	(-2.10)	(-2.12)
IC_WEAKNESS_START	1.631***	0.219***				
	(3.47)	(2.98)				
IC_WEAKNESS			1.687**	0.274***		
			(2.42)	(3.09)		
SIZE					1.072	0.031
					(0.87)	(0.88)
FIRM_AGE					0.543***	-0.260***
					(-4.42)	(-4.63)
LOSS					0.875	-0.091
					(-0.38)	(-0.52)
FOREIGN					0.866	-0.026
					(-0.41)	(-0.16)
ACQUISITION					1.672	0.278
					(1.19)	(1.17)
SALES_GROWTH					1.108	0.081
					(0.39)	(0.68)
RESTRUCTURE					23.073	1.665
					(0.87)	(0.83)
LSEGMENTS					1.047	0.028
					(0.20)	(0.30)
RHO STATISTIC		0.82		0.96		0.25
CHI SQUARE		2.06		3.90		0.28
P-VALUE		0.15		0.05		0.60
PSEUDO *R*2	0.13		0.15		0.23	
NO. OF OBSERVATIONS	1,758	1,758	1,927	1,927	1,927	1,927

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.

Panel B: ERROR vs. CEO tenure by CEO type

Panel B presents the results for hazard models examining the relation between reporting errors and CEO tenure for the four CEO type subsamples. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = ERROR			
	RECORD	NO RECORD	FRUGAL	UNFRUGAL
	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)
TENURE	0.939	1.038	0.982*	1.124***
	(-0.97)	(1.46)	(-1.78)	(2.74)
IC_WEAKNESS	0.215	1.670**	1.636*	1.322*
	(-0.94)	(2.32)	(1.76)	(1.86)
Z-STATISTICS: RECORD ≠ NO RECORD		-0.44		
FRUGAL ≠ UNFRUGAL				-2.94***
PSEUDO *R*2	0.05	0.09	0.06	0.15
NO. OF OBSERVATIONS	147	1,780	1,124	803

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.

Table 9

Analysis of culture channel

Panel A: Appointment of CFO type vs. CEO type

Panel A presents the results of logit models that examine the likelihood of hiring a CFO with a record or an unfrugal CFO as a function of CEO type. The first two columns present the log odds ratios and marginal effects for CFO record, and the next two columns present the log odds ratios and marginal effects for CFO frugality. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = CFO_RECORD		DEPENDENT VARIABLE = CFO_FRUGAL	
	COEF. (*Z*)	MARGINAL EFFECTS	COEF. (*Z*)	MARGINAL EFFECTS
INTERCEPT	-4.405**		2.102*	
	(-2.51)		(1.80)	
RECORD	1.065	0.096	0.173	0.028
	(1.34)	(1.39)	(0.27)	(0.27)
FRUGAL	-0.797**	-0.061**	1.011**	0.165**
	(-2.24)	(-2.25)	(2.31)	(2.47)
SIZE	0.142	0.011	-0.278**	-0.045**
	(0.78)	(0.78)	(-2.07)	(-2.18)
ROA	0.052**	0.004**	0.005	0.001
	(1.98)	(1.99)	(0.24)	(0.24)
MTB	0.014	0.001	0.298	0.049
	(0.13)	(0.13)	(1.53)	(1.56)
ACQUISITION	3.230	0.245	-4.202**	-0.686**
	(1.56)	(1.58)	(-2.02)	(-2.14)
STD_RET	1.565	0.119	-6.182*	-1.009*
	(0.31)	(0.31)	(-1.70)	(-1.77)
IND_COMP_CFO	0.002	0.001	0.001	0.002
	(0.18)	(0.18)	(0.99)	(1.00)
PSEUDO *R*2	0.20		0.15	
NO. OF OBSERVATIONS	137		137	

***Significant at the 1% level; **5% level; *10% level.

Panel B: Corporate culture vs. tenure by CEO type (RECORD)

Panel B presents the results of OLS and logit models that examine changes in corporate culture as a function of CEO record. The models include all firms—fraud, error, control—with available data up to year the fraud began (fraud firms), the error year (error firms), and 2005 (our last year with errors) for control firms. All variables are defined in the Appendix.

	DELTA	IC_WEAKNESS	%INDEP	SOCIAL	DIR_SHARES
	COEF.	COEF.	COEF.	COEF.	COEF.
	(*T*)	(*Z*)	(*T*)	(*Z*)	(*T*)
INTERCEPT	-3.607***	-0.685***	71.672***	0.116	0.618***
	(-3.81)	(-20.39)	(14.41)	(0.85)	(4.54)
RECORD	0.721	-0.010	-4.369	0.412	0.056
	(0.99)	(-0.13)	(-0.99)	(1.50)	(0.62)
TENURE	0.075*	0.000	-0.404***	0.005	-0.001
	(1.78)	(0.01)	(-3.43)	(0.95)	(-0.43)
RECORD × *TENURE*	-0.054	-0.002	0.005	-0.008	-0.006
	(-1.20)	(-0.38)	(0.01)	(-0.51)	(-1.22)
SIZE	0.400***		0.307	0.041**	-0.068***
	(4.02)		(0.58)	(2.17)	(-4.55)
MTB	0.127**		0.099	-0.010	0.022***
	(2.40)		(0.33)	(-0.60)	(3.09)
LEVERAGE	-0.005				-0.001**
	(-0.89)				(-2.21)
STD_RET	3.342*		-24.735**	-0.246	
	(1.86)		(-2.55)	(-0.62)	
R&D			0.001*		
			(1.85)		
CHI-SQUARE: *TENURE + RECORD x TENURE ≠ 0*	0.35	0.19	2.41	0.03	1.37
ADJUSTED *R*2 / PSEUDO *R*2	0.19	0.01	0.07	0.08	0.05
NO. OF OBSERVATIONS	1,828	2,893	1,508	1,586	1,466

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm. Interactions for logit models are calculated using the Norton, Wang, and Ai (2004) adjustment.

Panel C: Corporate culture vs. tenure by CEO type (FRUGAL)

Panel C presents the results of OLS and logit models that examine changes in corporate culture as a function of CEO frugality. The models include all firms—fraud, error, control—with available data up to year the fraud began (fraud firms), the error year (error firms), and 2005 (our last year with errors) for control firms. All variables are defined in the Appendix.

	DELTA	IC_WEAKNESS	%INDEP	SOCIAL	DIR_SHARES
	COEF.	COEF.	COEF.	COEF.	COEF.
	(*T*)	(*Z*)	(*T*)	(*Z*)	(*T*)
INTERCEPT	-3.254***	-0.664***	69.024***	-1.403**	0.584***
	(-3.69)	(-12.16)	(13.55)	(-2.18)	(5.01)
FRUGAL	-0.462	-0.041	2.937	-0.158	0.071
	(-1.35)	(-0.65)	(1.14)	(-0.34)	(1.61)
TENURE	0.042**	-0.001	-0.234	0.051**	-0.020*
	(2.02)	(-0.20)	(-1.29)	(2.11)	(-1.82)
FRUGAL × TENURE	-0.027*	0.001	-0.284	-0.036**	0.011*
	(-1.74)	(0.27)	(-1.19)	(-2.01)	(1.70)
SIZE	0.396***		0.342	0.174**	-0.069***
	(4.09)		(0.66)	(2.06)	(-4.60)
MTB	0.128**		0.053	-0.008	0.022***
	(2.41)		(0.18)	(-0.12)	(3.15)
LEVERAGE	-0.004				-0.001
	(-0.56)				(-1.47)
STD_RET	3.374*		-23.71**	-1.564	
	(1.83)		(-2.45)	(-0.84)	
R&D			0.002*		
			(1.83)		
F-STAT / CHI-SQ: *TENURE + FRUGAL x TENURE ≠ 0*	0.60	0.03	1.95	0.68	0.04
ADJUSTED *R*2 / PSEUDO *R*2	0.19	0.02	0.06	0.09	0.05
NO. OF OBSERVATIONS	1,828	2,893	1,508	1,586	1,466

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm. Interactions for logit models are calculated using the Norton, Wang, and Ai (2004) adjustment.

Table 10

Analysis of culture channel: FRAUD vs. corporate culture by CEO type

Table 10 presents the results of the hazard models examining the relation between fraud and aspects of the corporate culture that change during the tenure of unfrugal CEOs. The first three columns present results using the fraud versus non-fraud years of the fraud firms only, while the next three columns present results using all firms, i.e., the fraud and the non-fraud firms. All variables are defined in the Appendix.

	DEPENDENT VARIABLE = FRAUD						
	FRAUD FIRMS ONLY			FRAUD AND NON-FRAUD FIRMS			
	HAZARD RATIO (Z)	HAZARD RATIO (Z)	HAZARD RATIO (Z)	HAZARD RATIO (Z)	HAZARD RATIO (Z)	HAZARD RATIO (Z)	HAZARD RATIO (Z)
FRUGAL	1.130	1.291	0.954	0.829	0.738	1.544	0.839
	(0.67)	(0.84)	(-0.27)	(-0.85)	(-0.79)	(1.23)	(-0.80)
DELTA	1.039**			1.084			
	(2.31)			(1.47)			
DELTA x FRUGAL	0.981*			0.980			
	(-1.72)			(-0.92)			
CFO_RECORD					1.373		
					(1.02)		
CFO_RECORD x FRUGAL					1.074		
					(0.11)		
CFO_FRUGAL					0.578**		
					(-2.08)		
CFO_FRUGAL x FRUGAL					1.526		
					(0.88)		
SOCIAL		1.474***				2.638***	
		(2.73)				(3.16)	
SOCIAL x FRUGAL		0.729**				0.325**	
		(-2.22)				(-2.49)	
DIR_SHARES			1.118				0.923**
			(0.54)				(-2.05)
DIR_SHARES x FRUGAL			0.982				1.044*
			(-0.34)				(1.81)

Table 10 (Cont.)

	DEPENDENT VARIABLE = FRAUD						
	FRAUD FIRMS ONLY			FRAUD AND NON-FRAUD FIRMS			
	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)	HAZARD RATIO (*Z*)
TOBIN'S_Q	0.982	0.975	0.975	1.031	1.058*	1.068*	1.034
	(-0.69)	(-0.64)	(-1.03)	(1.19)	(1.77)	(1.91)	(1.20)
ROA	1.014*	1.027***	1.016**	1.007	1.010	1.012	1.004
	(1.66)	(2.61)	(2.01)	(0.84)	(1.15)	(1.31)	(0.50)
%IND_FRAUD	1.126	1.324***	1.189***	1.029	1.177	1.252*	1.112
	(1.41)	(2.76)	(2.85)	(0.27)	(1.43)	(1.94)	(0.78)
PSEUDO *R*2	0.03	0.09	0.05	0.04	0.08	0.13	0.03
NO. OF OBSERVATIONS	357	526	303	1,139	1,152	931	1,378

***Significant at the 1% level; **5% level; *10% level. Standard errors are clustered by firm.