

Incentives to Cheat: The Influence of Executive Compensation and Firm Performance on Financial Misrepresentation

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Despite the many undesirable outcomes of corporate misconduct, scholars have an inadequate understanding of corporate misconduct's causes and mechanisms. We extend the behavioral theory of the firm, which traditionally assumes away the possibility of firm impropriety, to develop hypotheses predicting that top management incentive compensation and poor organizational performance relative to aspirations increase the likelihood of financial misrepresentation. Using a sample of financial restatements prompted by accounting irregularities and identified by the U.S. Government Accountability Office, we find empirical support for both incentive and relative performance influences on financial statement misrepresentation.

Key words: corporate misconduct; behavioral theory; executive compensation; relative performance

Introduction

Corporate misconduct can hurt firms and their stakeholders. Revelations of misconduct often result in massive and sometimes ruinous corporate economic outcomes, often damaging corporate stakeholders such as employees, customers, suppliers, and investors. Furthermore, important economic institutions depend on a basic level of ethical corporate behavior; misconduct can damage such institutions, adversely affecting society's economic and social progress. Government actions prompted by corporate misbehavior impose costs that business practitioners often describe as cost prohibitive and onerous, whether or not a firm engages in impropriety.

This combination of factors illustrates the potential tension between the economic and social objectives of business, at both the societal and organizational level. Margolis and Walsh (2003) suggest that research questions exploring this tension offer an important, but neglected, research opportunity for scholars of strategic management and organizational theory. This study focuses on the antecedents of corporate wrongdoing; specifically, we examine the factors that encourage a firm to misrepresent its financial position—a particular type of firm misconduct that has surfaced with increasing frequency in recent years.

Building on the behavioral theory of the firm, we argue that top management incentive compensation and poor organizational performance relative to aspirations each increase the likelihood of financial misrepresentation, and find empirical support for these effects. In

addition to the study's theoretical and empirical contributions to our understanding of corporate misconduct, this research also has implications for behavioral theory. Our analysis shows how traditional theoretical frameworks have been insufficiently nuanced because they implicitly assumed that inducements produce only ethical, legitimate organizational actions. Explicitly allowing for misconduct, as we do here, leads to drastically different theoretical predictions. Our empirical analysis indicates that several factors—in this case, an organization's performance incentives and comparisons of organizational performance relative to aspiration levels—produced outcomes that were unanticipated and undesirable.

We advance the behavioral theory of the firm in several ways. First, we demonstrate its relevance to corporate misconduct—an area of corporate behavior to which the behavioral theory of the firm has not been applied. Second, we incorporate a managerial incentive argument from the behavioral perspective and find support for it. Third, we demonstrate that behavioral variables influence behavior even when controlling for corporate governance mechanisms. Finally, we demonstrate that the difference between performance and aspirations has a highly nonlinear influence on behavior. While many scholars have demonstrated a nonlinearity when performance shifts from below aspirations to above aspirations, we also find substantial nonlinearities at extreme values of performance relative to aspirations.

The next section discusses the problem of financial misrepresentation. The section after that then details our

arguments of how incentives and relative performance influence corporate financial misrepresentation. We then present our data and empirical tests, concluding with additional analyses and a discussion of the results.

The Problem of Financial Misrepresentation

Corporate misconduct has been broadly conceived as the organizational pursuit of any action considered illegitimate from an ethical, regulatory, or legal standpoint. Given such an expansive definition, researchers have responded by examining corporate actions that correspond to different types of organizational conduct considered improper, including environmental violations (e.g., McKendall and Wagner 1997), the production of dangerous consumer goods (e.g., Bromiley and Marcus 1989), misleading advertising (e.g., Szwajkowski 1985), deceptive sales practices (e.g., MacLean 2002), violations of government labor regulations (e.g., Hill et al. 1992), and white-collar crime (e.g., Clinard and Yeager 1980). While some research suggests firm misconduct damages the firm's economic performance (e.g., Baucus and Baucus 1997), other research indicates that both market punishments (Bromiley and Marcus 1989) and self-regulation by corporate coalitions (King and Lenox 2000) insufficiently deter corporate misconduct, illustrating again the tension between society's economic and social objectives.

We focus specifically on the problem of financial misrepresentation, which has begun to attract research attention in strategy and organization theory (Arthaud-Day et al. 2006, Dunn 2004, O'Connor et al. 2006, Wiesenfeld et al. 2006), finance (Burns and Kedia 2006, Burns et al. 2006), and accounting (Desai et al. 2006, Erickson et al. 2006, Srinivasan 2005). Misleading financial statements can damage the firms involved, the firm's direct stakeholders, and the economic system as a whole, which depends on reasonably accurate financial reporting to support the stock and debt markets.

Studying financial misrepresentation requires identifying such misrepresentations. Studies of corporate misconduct often emphasize different types of criminal convictions (Baucus and Near 1991, Cochran and Nigh 1987, Daboub et al. 1995, Rezaee 2005, Schnatterly 2003, Staw and Szwajkowski 1975), but few companies are convicted of financial misrepresentation. Convictions associated with misrepresentation often reflect criminal acts ancillary to the misrepresentation, such as the destruction of information in an investigation. In addition, many cases of acknowledged improper financial misrepresentation do not lead to criminal charges. Thus, criminal convictions offer a poor indicator of financial misrepresentation.

Some scholars, primarily in accounting, have studied earnings manipulation or income smoothing as a form of undesirable corporate misconduct (Becker et al. 1998,

Dechow et al. 1996, Ronen et al. 2006). However, while many firms smooth their reported income (DeGeorge et al. 1999, Jenkins et al. 2006), scholars debate whether income smoothing is problematic, or benign and inconsequential (Dechow and Skinner 2000), or even advantageous (Tucker and Zarowin 2006). The usefulness of earnings manipulation as a proxy for misrepresentation rests on the unresolved question of whether or not it constitutes serious misconduct.

However, when implemented by clear, egregious, and material violations of appropriate accounting practices, financial manipulations constitute misconduct. Therefore, we focus on financial restatements triggered by "accounting irregularities." Although firms often restate their financials for noncontroversial reasons such as stock splits, mergers, or formal changes in accounting methods, accounting restatements also arise from material misrepresentations and accounting improprieties. Our analysis uses a set of these misrepresentations identified by the General Accounting Office (GAO) now called Government Accountability Office. According to the GAO, these particular restatements resulted from "aggressive accounting practices, misuse of facts, oversight or misinterpretation of accounting rules, and fraud" (U.S. General Accounting Office 2003, p. 4). Whereas the propriety of more mild income smoothing may be somewhat indeterminate, as previously discussed, restatements for accounting irregularities are, in contrast, a "direct admission by managers" of misrepresentation (Agrawal and Chadha 2005, p. 373). Although not all such restatements are criminally fraudulent, they have been considered a proxy for fraud (O'Connor et al. 2006), and described as "ethics failures" (Staubus 2005, p. 5). At the least, these restatements indicate both "severe shortcomings in both internal and external governance mechanisms" (Arthaud-Day et al. 2006, p. 1121) and controversial organizational actions (Lange 2005), constituting a unique form of corporate failure (Wiesenfeld et al. 2006). As one GAO analyst put it, "these aren't bookkeeping errors," further suggesting that the character of the rule violations indicates that they are "more likely to reflect intentional manipulation" than substantial, but somehow inadvertent, departures from generally accepted accounting principles. This is consistent with past auditing standards that described "irregularities" as intentional acts (AICPA 1993). Therefore, while the most serious restatements involve criminal fraud, all the restatements examined here represent major accounting rules violations that the GAO identified as intentionally improper.

The GAO identified 919 such restatements announced between January 1997 and June 2002. This indicates that 9.95% of all public companies restated their financials due to accounting irregularities during that period, and the restatements increased in frequency 145% during the years studied, lowering the market value of firms by \$100 billion (U.S. General Accounting Office 2002).

The prevalence and impact of this kind of accounting disinformation continues to pose a significant problem for the economy (Kane 2004, Kedia and Philippon 2006). Throughout the rest of the paper, we use the term restatement strictly in reference to these restatements due to accounting irregularities.

Theory and Hypotheses

Building on the behavioral theory of the firm, we present hypotheses for two influential influences on corporate misrepresentation: managerial incentives, and organizational aspirations versus performance. We chose these two factors as representative of two major lines of research on corporate behavior—relative performance (in both the behavioral theory of the firm and risk-taking literatures), and managerial incentives (in both the behavioral and agency traditions).

Behavioral Theory and Incentives

Financial incentives for top managers have grown radically over the past several decades, jumping from 100 times the pay of a typical worker in 1990 to somewhere between 350 times and 570 times the pay of a typical worker (Hall and Murphy 2003, Rynes and Gerhart 2000, Young 1998). The proportion of corporate value tied up in stock options has become substantial, and stock options' use in executive compensation packages often represents the largest portion of CEO pay (Hall 2003, Hall and Liebman 1998). Indeed, in our sample, CEO options can be valued at nearly 20 times the CEOs' base salaries. CEOs and other top managers are given strong incentives through stock options.

Although scholarly work on incentives for top corporate managers typically draws on agency theory, which assumes that agents respond optimally to their incentive structures, a bounded rationality perspective also suggests that rewards for specific outcomes increase the probability that individuals work toward those outcomes. Although a few scholars (e.g., Sanders and Carpenter 2003, Wiseman and Gomez-Mejia 1998) have recently blended assumptions from the two traditions into a “behavioral-agency theory,” Kaplan and Henderson (2005, p. 509) lament that the analysis of managerial incentives and compensation structures has largely been relegated to organizational economists and agency theorists. They argue that core behavioral constructs are “phenomenologically deeply intertwined” with incentives.

According to March and Simon (1958/1993, p. 82), “the greater the dependence of monetary reward on performance, the more favorable are the consequences perceived as resulting from a decision to increase production.” March and Simon argue that inducements will increase effort allocated toward the goals attached to the inducements. Recognizing that some criteria differ in

clarity, they emphasize that the “subjective operationality of performance criteria”—the extent to which managers believe they understand the connection between specific behaviors and performance ratings—influences the impact of such criteria on behavior. Such performance criteria can influence search (i.e., the actions managers consider) as well as choice (the actions undertaken). Thus, well-defined incentive criteria tied to substantial rewards will influence managerial action. CEO incentive compensation, such as stock options or bonuses tied to performance, usually offers very clear connections between firm performance and individual compensation. Predictions from behavioral theory regarding executives' responses to equity-based incentives have been empirically demonstrated (e.g., Sanders 2001).

Cyert and March (1963/1992) describe the organization as a coalition where the participants or stakeholders (as individuals or groups) pursue their own interests. In this theory, corporate misconduct can arise if participants (or a dominant coalition of participants) with the ability to implement misconduct see misconduct as benefiting themselves. However, researchers have not addressed such potential misconduct explicitly, instead implicitly assuming that firms and individuals use reasonably legitimate or ethical means to achieve their goals.

Incentives and Financial Misrepresentation

We argue that relaxing this implicit assumption—by explicitly acknowledging misconduct as part of the available choice set—leads to new predictions. Hence, a corporate manager with an incentive to increase reported earnings has *several* possible courses of action. The manager might attempt to improve real financial performance, an approach consistent with the traditional, sanguine view, by legitimately working to increase real sales, decrease real costs, and increase real earnings, but the manager might also attempt to increase reported organizational performance via illicit means.

Illicit means can include direct misrepresentation of the firm's financial outcomes, or improper activities that require financial misrepresentation to avoid exposure. By improving reported performance, such activities can elevate stock prices and executive compensation, at least in the short term. Even if we assume that managers generally prefer ethical actions,¹ the likelihood of managerial impropriety rises with the strength of the inducements; people may prefer honesty, but can be tempted. It is easy to be ethical if a small portion of one's pay is at stake; it is harder to be ethical when substantial portions of one's pay can be influenced through misrepresentation. The strong incentive power of stock options means that “the temptation to inflate stock prices artificially will also be strong” (Varian 2002, p. c1), especially when options constitute a large portion of a CEO's pay package.

Behavioral assumptions suggest that the strength or magnitude of the temptation influences whether a normally fallible individual succumbs to temptation and cheats.

Following a long tradition in strategic management, we emphasize the influence of CEO incentives on firm behavior. Because CEO incentives to increase reported firm performance can encourage misrepresentation of the firm's finances, the strength of the incentive positively influences the likelihood of financial misrepresentation.² We consider two kinds of incentives, bonuses and stock option grants. Stock options offer strong encouragement to raise the stock price above the strike price; the stock price must rise above the strike price for executives to profit from their options. Firms clearly represent bonuses as incentives, and while the bonuses paid in the past do not themselves offer incentive for future behavior, they serve as a proxy to indicate the size of potential future bonuses. Thus, we hypothesize:

HYPOTHESIS 1. The proportion of CEO pay from stock options positively influences the probability of accounting misrepresentation.

HYPOTHESIS 2. The proportion of CEO pay from bonuses positively influences the probability of accounting misrepresentation.

Behavioral Theory and Aspirations

The behavioral theory of the firm argues that organizations strive to achieve their aspirations, and that firms with performance below aspirations search for ways to improve reported performance to a satisfactory level. This process of aspirations relative to performance driving problemistic search has been applied to organizational change (Greve 1998), risk taking (Bromiley 1991; Deephouse and Wiseman 2000; Fiegenbaum 1990; Fiegenbaum and Thomas 1986, 1988; Gooding et al. 1996; Miller and Bromiley 1990; Miller and Chen 2004; Miller and Leiblein 1996; Palmer and Wiseman 1999; Singh 1986; Wiseman and Bromiley 1996; Wiseman and Catanach 1997), innovation (Greve 2003a, Levinthal and March 1981), R&D (Fleming and Bromiley 2002), and capital investment (Greve 2003b).

The behavioral literature suggests that a firm's aspirations, or acceptable levels of accomplishment, adapt to two factors: the firm's own historical performance and the performance of other firms (Cyert and March 1963/1992, Lant 1992, March and Simon 1958/1993). Aspirations rise when a firm exceeds its past performance, and fall after the firm's performance declines. The firm's aspirations also rise or fall with respect to a social comparison to the performance of similar firms; for example, a firm's aspiration for sales growth may depend on how fast other firms in the industry have grown.

A measure of relative performance, then, is a firm's performance minus its aspiration level (Fleming and

Bromiley 2002). Thus, relative performance increases as firm performance improves. Performance above the reference point is positive relative performance, and performance below the reference point is negative relative performance. Large values of positive relative performance equate to being far above the reference point. In contrast, less negative (higher) values of negative relative performance equate to being closer to the reference point, and very negative values to performance well below the reference point. Both theory (Cyert and March 1963/1992) and empirical work (Mezias et al. 2002) indicate that social- and self-referent relative performance both influence an organization's aspirations.

Aspirations and Financial Misrepresentation

However, as with incentives above, scholarly work on aspiration levels implicitly assumes ethical outcomes, ignoring the possibility that firms solve their performance problems through improper actions. Although March and Simon (1958/1993) suggested that managers may selectively emphasize measures that show high performance, or even take actions to influence the measurement regime itself, it did not consider that firms might deliberately *misrepresent* reported performance.

Once again, we suggest that explicitly acknowledging such misconduct as part of the available set of choices opens the door to different theoretical predictions. Specifically, we argue that search may culminate in financial misrepresentation. Firms engaging in search may find misrepresentation a viable, readily available, and obvious option for raising reported performance above aspirations. This coincides with empirical research in corporate crime; firms in low-performing industries commit crimes more frequently than firms in high-performing industries (Staw and Szwejkowski 1975), and environmental crimes are more common among firms with poor prior performance (Alexander and Cohen 1996).

Our argument parallels previous arguments concerning aspiration levels and risk (Bromiley 1991; Fiegenbaum 1990; Fiegenbaum and Thomas 1986, 1988; Greve 1998, 2003b; Miller and Bromiley 1990; Singh 1986; Wiseman and Bromiley 1996; Wiseman and Catanach 1997). Falsifying financial reports constitutes a risky action. While firms with performance close to their reference points may hope to achieve aspirations via legitimate means, firms performing far below their aspirations may find few perceived legitimate solutions. Thus, the distance a firm performs below its reference points increases the likelihood of misrepresentation.

We consider two kinds of relative performance—social and self. While some behavioral work combines social and historical reference points into a single aspiration level for each dimension (e.g., return on assets), this limits the ability to test such effects independently.³ Therefore, we allow for the possibility that firms consider social and self comparisons separately. Thus:

HYPOTHESIS 3. *For social relative performance values less than zero, social relative performance negatively influences the probability of accounting misrepresentation; i.e., the probability of misrepresentation will be highest for the lowest (most negative) values of negative social relative performance.*

HYPOTHESIS 4. *For self-relative performance values less than zero, self-relative performance negatively influences the probability of accounting misrepresentation; i.e., the probability of misrepresentation will be highest for the lowest (most negative) values of negative self-relative performance.*

In addition, March and Simon (1958/1993) argue for a strong effect when a firm moves from just below to just above the aspiration point. That is, firms define their performance in rough terms as either acceptable or unacceptable, and this dichotomy has substantial impact. This suggests that when performance is near the aspiration level, a small movement in performance from below to above the reference point may have a more significant impact than larger changes in other ranges.

Consequently, a discontinuity should occur where performance equals aspirations; the aspiration point divides the range of potential performance into two broad categories. Following the same arguments already employed, firms below their aspirations search for ways to move reported performance above aspired performance, and such a search may include misrepresentation. Thus, when performance is above aspirations, the probability of financial misrepresentation should generally be less than when it is below aspirations.

HYPOTHESIS 5. *Having positive instead of negative relative performance negatively influences the probability of accounting misrepresentation.*

Prior behavioral work has investigated slack search, which can occur when firms have performance well above their aspiration levels. To be consistent with prior work, we include relative performance variables for performance above the reference point, but we do not argue for, or expect, any effect in our data. While some scholars argue that firms with very high performance may take risks (because they can do so without risking falling below their aspiration levels), we do not anticipate that effect with financial misrepresentations. Failure of a gamble on financial misrepresentation can devastate a firm regardless of its performance level, so we suspect that such misrepresentation is much more likely to be a result of problemistic search than slack search.

Data and Methods

From the GAO, we obtained a sample of firms with income restatements (U.S. General Accounting Office 2002, 2003). They attempted to identify all restatements due to accounting irregularities that had been

announced between January 1997 and June 2002, finding 919 restatements announced by 845 firms. All the restatements reflect accounting “irregularities,” such as material errors and fraud. The GAO excluded restatements for stock splits, mergers, formal changes in accounting methods, or other legitimate business purposes. We informally compared the GAO list with the comprehensive restatement lists other academic researchers independently accumulated for similar years, and found that the lists largely agreed, although the GAO found a few more restatements than the academic researchers did. This suggests that the GAO list includes substantially all the restatements of interest in the period.

Because restatements occur relatively infrequently (i.e., in any given year, a firm has a low probability of a restatement), making random sampling infeasible, we employ a matched-sample design.⁴ Matched-sample designs have been used in other studies of financial restatements (Aier et al. 2005, Arthaud-Day et al. 2006, Kinney et al. 2004, O’Connor et al. 2006), and other similarly infrequent phenomena (Cannella et al. 1995, Daily and Dalton 1994, Erickson et al. 2006, Hambrick and D’Aveni 1988). The model estimation uses conditional logit, a standard procedure for estimating models with matched case-control samples and zero/one dependent variables (Bowen and Wiersema 2004, Holford 2002). Conditional logit estimates a logit with a fixed effect for each match.

We matched each restating firm with a firm with sales similar to the referent firm in the same four-digit standard industry classification (SIC) code industry, subject to several conditions. We dropped firms for which Compustat did not provide the necessary financial data, or for which we could not find the needed executive compensation data. Many such firms had primary listings on foreign stock exchanges and appeared in domestic markets only as American depository receipt (ADR) companies. Such firms are not required to file proxy statements with detailed executive compensation information. In addition, we dropped firms with other anomalies, such as zero sales, no identifiable CEO, or CEOs that received zero compensation. We also dropped some misrepresenting firms for which no appropriate matching firm could be identified.⁵ The final sample included 434 misrepresenting firms for which we could find appropriate matching firms, giving a total usable sample of 868. The misrepresenting firms’ sales range from \$357,000 to \$39.1 billion. Matching firms’ sales range from \$218,000 to \$137.6 billion. Mean sales for restating and matching firms are \$2.0 billion and \$1.7 billion, respectively. The differences are not statistically significant; see Table 1 for full descriptive statistics on the sample. Although the matched-sample design reduces the need for control variables, we include the log of sales in the year before the restatement in the model estimations to further control for variance in size.

Table 1 Descriptive Statistics

| Variable | Mean | Std dev | Minimum | Maximum |
|-----------------------------------------------|-----------|------------|---------|-------------|
| Restatement firms | | | | |
| Salary $t - 1$ | 417,734 | 291,469 | 0 | 2,255,443 |
| Bonus $t - 1$ | 396,417 | 1,030,752 | 0 | 12,500,000 |
| Options $t - 1$ | 7,261,117 | 26,700,000 | 0 | 399,000,000 |
| % of total compensation in salary $t - 1$ | 37 | 34 | 0 | 100 |
| % of total compensation in bonus $t - 1$ | 12 | 16 | 0 | 89 |
| % of total compensation in options $t - 1$ | 50 | 39 | 0 | 100 |
| Sales $t - 1$ (000,000) | 2,082 | 5,340 | 0.357 | 39,090 |
| Assets $t - 1$ (000,000) | 2,629 | 8,074 | 1.43 | 98,903 |
| Matching firms | | | | |
| Salary $t - 1$ | 408,407 | 303,494 | 0 | 2,900,000 |
| Bonus $t - 1$ | 325,424 | 581,656 | 0 | 5,672,500 |
| Options $t - 1$ | 3,177,937 | 11,000,000 | 0 | 171,000,000 |
| % of total compensation in salary $t - 1$ | 46 | 35 | 0 | 100 |
| % of total compensation in bonus $t - 1$ | 15 | 18 | 0 | 100 |
| % of total compensation in options $t - 1$ | 39 | 38 | 0 | 100 |
| Sales $t - 1$ (000,000) | 1,774 | 7,485 | 1.69 | 137,634 |
| Assets $t - 1$ (000,000) | 2,211 | 7,569 | 1.915 | 87,270 |

We used several data sources. Financial data came from Compustat. Compensation data came from S&P Execucomp where available, with the remaining compensation observations collected directly from firm proxy statements using the SEC’s EDGAR database. We identified the specific dates for the first year restated from press reports and filings in the EDGAR database.

Dependent Variable

The GAO sample identified the date that each misrepresenting firm announced their restatements. We identified the actual year misrepresented by searching for the appropriate announcements in the business press and analyzing the EDGAR database. In a few cases where the actual restatement year could not be identified definitively, we assumed it was the year immediately preceding the announcement of the restatement. Where firms restated multiple years, we used the first year restated as the event year of interest and dropped the remaining observations for that firm. Thus, “repeat offender” firms only appear once in the sample. After a firm misrepresents its financials once, it faces a different situation than a firm contemplating misrepresentation for (apparently) the first time.

The restatements reflect a wide range of specific types of misrepresentations. For example, some restatements adjust revenue or expenses, while others address equity-related or securities issues. Although subsequent research could further investigate a variety of ways in which the restatements differ (e.g., accounting type and magnitude), this study focuses on the effect of incentives and aspirations on the probability of *any* type of misrepresentation involving egregious accounting rules

violations. Therefore, in our conditional logit estimation, the dependent variable is a dummy that equals one for firms that had misrepresentations, and zero for firms that did not.

However, we did test whether our statistical results were consistent across all kinds of restatements. Using classifications of types of restatements from Badertscher et al. (2005), we tested whether dropping different types of restatements (e.g., income statement corrections versus balance sheet corrections, or positive earnings restatements versus negative earnings restatements) changed our results. None of the parameters changed significantly in these subsamples, nor did their statistical significance change substantially (although it generally diminished due to smaller sample sizes). Because these tests do not give any indication that the type of restatement matters, we test our hypotheses without distinguishing among the various types of financial statement irregularities, consistent with prior literature (Beasley 1996, Hansen et al. 1996).

Independent Variables

Incentive Compensation. Consistent with numerous studies of corporate behavior, we focus on the CEO’s incentives. However, CEO compensation may constitute a proxy for the compensation approach utilized for *all* the firm’s top managers, including the CFO. We include three kinds of compensation—base salary, bonuses, and options. Salary and bonuses came directly from Compustat’s Execucomp or firm proxy statements.

Options require additional calculation. Firms use differing techniques to value options, making their estimates of total value of options incomparable across firms. Whether using Execucomp or proxy statements, we use raw data on stock option grants to value the options consistently. We value CEO stock option grants using a 10% growth model.⁶ Although separately reported, restricted stock awards are much less common than stock option grants. We include them in the calculation of options value, because such awards equate to stock options “with an exercise price of zero” (Bulow and Shoven 2005, p. 116). We added the values, if any, of restricted stock awards, if any, to the values of stock options granted, giving the total value of stock option compensation used in the analysis (although to address concerns about differing downside risks between restricted stock and stock options, we also ran the analysis with separate options and restricted stock variables, and the results did not change). The study did not consider long-term incentive program payments, reload options, and option repricings.

The importance of incentive compensation to a manager may depend on how much other compensation the manager receives. In addition, compensation data, particularly options and bonuses, have extremely skewed distributions. Consequently, we measure incentives by the

option or bonus value relative to the CEO's total compensation. This creates option and bonus ratios bounded between zero and one.

Options/total compensation is calculated as total stock option grant value divided by the total compensation (the sum of salary, bonus, and options). *Bonus/total compensation* is calculated as the bonus over total compensation. Both options/total compensation and bonus/total compensation use data from the year immediately before the year of misrepresentation.

Relative Performance. We examine two different aspiration levels or reference points to calculate two measures of relative performance—self and social. As noted above, researchers have used a variety of aspiration measures. Some combine social and self additively into one measure (Greve 2003a, Mezas et al. 2002). Others create one aspiration variable that equals the self-reference point if a firm is above the social comparison level, and the social comparison level if the firm is below the social comparison level (Bromiley 1991, Deephouse and Wiseman 2000, Wiseman and Bromiley 1996, Wiseman and Catanach 1997). Some use only social comparisons (Fiegenbaum and Thomas 1986, 1988; Fiegenbaum 1990; Miller and Bromiley 1990).

Following Fleming and Bromiley (2002) and Greve (1998, 2003b), we use separate measures of social and self-aspirations rather than blending them into one aggregate relative performance measure (e.g., Greve 2003a).

Self-Relative Performance. Some research on aspiration levels indicates that aspirations adapt slowly (Greve 2002, 2003b), and calculates weighted averages of several years of performance data in computing current-year aspiration levels. Because such research typically deals with phenomena like organizational change and innovation, we believe that the “sticky” aspirations may reflect organizational inertia. In contrast, financial misrepresentation does not lend itself to sticky aspirations; it is likely an emergent short-term tactic for a perceived short-term problem. In addition, the previous year's performance appears routinely in firm planning and decision-related documents, whereas performance two years previously seldom appears (see Bromiley 1986, Eliasson 1976). Therefore, we measure self-relative performance by a firm's net income before extraordinary expenses, divided by assets in the year before the restatement year (ROA_{t-1}), minus the return on assets for two years before the restatement year (ROA_{t-2}).⁷

Because the theory argues that firms react differently to performance above versus below aspirations, we split *self-relative performance* into two variables to allow for different slopes for positive and negative values. *Self-positive relative performance* equals zero whenever *self-relative performance* is negative and equals *self-relative*

performance otherwise. Symmetrically, *self-negative relative performance* equals zero for all observations where *self-relative performance* exceeds zero and equals *self-relative performance* otherwise.

To test Hypothesis 4, we include a dummy variable that equals one for *self-relative performance* greater than zero and equals zero otherwise. This permits a discontinuity in the influence of *self-relative performance* at zero.

Social Relative Performance. We measure social relative performance as the firm's return on assets in the year prior to the misrepresentation minus the mean return on assets for the firm's industry for the same year ($ROA_{t-1} - (\text{Industry income}_{t-1} / \text{Industry total assets}_{t-1})$) excluding the focal firm in the industry calculations. We form the comparison industry from Compustat data on firms in the same four-digit SIC code as the focal firm. As with *self-relative performance*, separate variables are constructed for positive and negative values of *social relative performance* and a dummy variable for positive values of *social relative performance*.

Results

Table 3 reports conditional logit estimations of the model with different treatments of outliers on relative performance. The first column of results presents estimates, dropping all observations with relative performance values greater than 0.5 or less than -0.5 . (Note that these values are extreme. If the industry average ROA were 0.10, then the firm would need ROA under -0.40 to have relative performance under -0.50 . The firm's negative income is 40% of its assets.) The second column reports estimates, dropping all observations with relative performance values greater than 1 or less than -1 . The third column reports estimates using all observations. In the discussion, we will present the parameters for the three columns in order: (i) with $+/-0.5$ cutoffs, (ii) with $+/-1$ cutoffs, (iii) with all observations. The plots represented in all the figures are based upon the parameters of the second column with the $+/-1$ cutoff.

For the overall conditional logit models, we can reject the hypothesis that the parameters equal zero (chi-squares with nine degrees of freedom of 45.31, 67.6, and 60.35, all $p < 0.0001$). All estimates predicted about 65% of the observations correctly, which significantly exceeds the 50% expected by chance ($p < 0.00001$).

As the results in Table 3 indicate, the data strongly support Hypothesis 1; the fraction of CEO compensation in options positively influences the probability of accounting misrepresentation (parameters of 0.0082, $p < 0.01$; 0.0088, $p < 0.001$; and 0.0080, $p < 0.001$). Hypothesis 2, however, is not supported. The strong result of incentives influencing misrepresentation only

Table 2 Correlation Matrix for Subsample with Governance Controls

| | Restatement | Options/total pay _{t-1} | Bonus/total pay _{t-1} | Neg self relative perf _{t-1} | Self perf _{t-1} > 0 dummy | Positive self relative perf _{t-1} | Neg social relative perf _{t-1} | Social perf _{t-1} > 0 dummy | Positive social relative perf _{t-1} | Log sales _{t-1} | Restricted stock/total pay _{t-1} | CEO also board chair _{t-1} | Fraction board independent _{t-1} | Fraction institutional blocks _{t-1} | Block holder dummy _{t-1} |
|-------------------------------------------------------|-------------|-------------------------------------|-----------------------------------|---------------------------------------------|------------------------------------------|-----------------------------------------------------|--------------------------------------------------|--------------------------------------------|-------------------------------------------------------|-----------------------------|-------------------------------------------------|-------------------------------------------|-------------------------------------------------|----------------------------------------------------|-----------------------------------------|
| Restatement | 1.0000 | | | | | | | | | | | | | | |
| Options/total pay _{t-1} | 0.1527 | 1.0000 | | | | | | | | | | | | | |
| Bonus/total pay _{t-1} | -0.1066 | -0.4574 | 1.0000 | | | | | | | | | | | | |
| Negative self-relative perf _{t-1} | -0.0790 | 0.0308 | 0.1083 | 1.0000 | | | | | | | | | | | |
| Self-performance _{t-1} > 0 dummy | -0.0783 | -0.0497 | 0.1679 | 0.5105 | 1.0000 | | | | | | | | | | |
| Positive self-relative performance _{t-1} | 0.0027 | -0.0984 | 0.0356 | 0.2365 | 0.4633 | 1.0000 | | | | | | | | | |
| Negative social relative perf _{t-1} | -0.0946 | 0.0146 | 0.1272 | 0.5293 | 0.2112 | -0.2104 | 1.0000 | | | | | | | | |
| Social performance _{t-1} > 0 dummy | -0.0406 | -0.0230 | 0.1545 | 0.2333 | 0.2141 | -0.0600 | 0.2573 | 1.0000 | | | | | | | |
| Positive social relative perf _{t-1} | -0.0190 | 0.0010 | 0.0584 | 0.1482 | 0.1868 | 0.0574 | 0.1360 | 0.5284 | 1.0000 | | | | | | |
| Log sales _{t-1} | 0.0205 | 0.2873 | 0.1330 | 0.1820 | 0.0368 | -0.2238 | 0.3630 | 0.2504 | 0.1009 | 1.0000 | | | | | |
| Restricted stock/total pay _{t-1} | 0.0835 | -0.0892 | 0.0751 | 0.0387 | -0.0408 | -0.0369 | 0.0559 | 0.0856 | -0.0287 | 0.1092 | 1.0000 | | | | |
| CEO also board chair _{t-1} | -0.0427 | -0.0898 | 0.1392 | 0.0436 | 0.0701 | 0.0560 | 0.0052 | -0.0791 | -0.0234 | 0.0013 | 0.0013 | 1.0000 | | | |
| Fraction of board independent _{t-1} | -0.0053 | 0.1196 | 0.0618 | 0.0558 | 0.0155 | -0.0262 | 0.1088 | 0.1605 | 0.0906 | 0.1241 | -0.0174 | -0.0017 | 1.0000 | | |
| Fraction institutional blockholders _{t-1} | 0.0046 | 0.1712 | -0.0540 | 0.0302 | -0.0968 | -0.1054 | 0.1236 | 0.0155 | -0.0411 | 0.3108 | -0.0082 | -0.0704 | 0.0172 | 1.0000 | |
| Blockholder dummy _{t-1} | 0.0178 | 0.1051 | 0.0844 | -0.0043 | -0.0480 | 0.0351 | -0.0749 | 0.0376 | 0.0756 | -0.0073 | -0.1224 | -0.0138 | 0.0462 | 0.2616 | 1.0000 |

Table 3 Conditional Logit Results Explaining Financial Misrepresentation¹

| | DV: Restatement = 1, no restatement = 0 | | | | |
|-------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|----------------------------|----------------------------------|--------------------------------------------------------------|
| | Observations with abs(relative performance) < 0.5 (1) | Observations with abs(relative performance) < 1 (2) | All observations (3) | Subsample observations (4) | Subsample observations with governance controls (5) |
| Options/total compensation $t - 1$ | 0.00824** (0.0025) | 0.00878*** (0.0025) | 0.00800*** (0.0024) | 0.0165** (0.0055) | 0.0208*** (0.0062) |
| Bonus/total compensation $t - 1$ | -0.00546 (0.0055) | -0.00492 (0.0054) | -0.00423 (0.0052) | 0.00798 (0.0099) | 0.0133 (0.011) |
| Negative self-relative performance $t - 1$ | 0.334 (2.06) | -0.144 (1.67) | 3.771*** (1.15) | 5.930 (4.10) | 6.649 (4.21) |
| Self performance > 0 dummy $t - 1$ | -0.396 [†] (0.21) | -0.410* (0.20) | -0.653*** (0.18) | -0.149 (0.38) | -0.217 (0.40) |
| Positive self-relative performance $t - 1$ | 3.303 [†] (1.75) | 4.052** (1.37) | 3.295** (1.15) | 1.069 (2.77) | 1.511 (2.95) |
| Negative social relative performance $t - 1$ | -4.961** (1.55) | -5.326*** (1.28) | -3.421*** (1.01) | -7.974** (2.97) | -8.478** (3.05) |
| Social performance > 0 dummy $t - 1$ | 0.214 (0.22) | 0.357 [†] (0.21) | 0.195 (0.20) | 0.363 (0.40) | 0.309 (0.41) |
| Positive social relative performance $t - 1$ | 0.452 (1.86) | -1.265 (1.45) | -1.095 (1.43) | -2.385 (3.59) | -2.135 (3.68) |
| Log sales $t - 1$ | 0.327* (0.13) | 0.325* (0.13) | 0.232 [†] (0.12) | 0.559* (0.27) | 0.528 [†] (0.27) |
| Restricted stock/total compensation $t - 1$ | | | | | 0.604 (0.59) |
| CEO chairs board | | | | | -0.351 (0.33) |
| Fraction of board independent | | | | | -0.458 (0.68) |
| Fraction of stock held by institutions | | | | | 0.00166 (0.014) |
| Block stockholding | | | | | -0.167 (0.37) |
| Observations | 792 | 842 | 868 | 276 | 276 |
| Chi squared | 45.31 | 67.60 | 60.35 | 21.95 | 29.78 |
| $P(\text{chi-squared})$ | <0.0001 | <0.0001 | <0.0001 | 0.0090 | 0.0082 |
| Pseudo R squared | 0.0825 | 0.116 | 0.100 | 0.115 | 0.156 |

Notes. Standard errors in parentheses.

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

holds for options. The coefficient estimates on bonuses are not statistically significant.

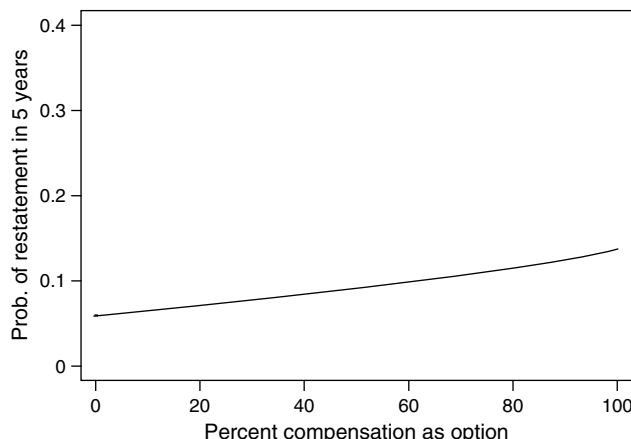
Interpreting the magnitude of effects from conditional logit estimation presents some difficulties. Think of the conditional logit as a logit with a fixed effect for each pair. The probabilities depend on a nonlinear function of $c_i + XB$ where c_i is the fixed effect for each matched pair and XB combines the variables and estimated parameters. In addition to the normal nonlinear issues associated with discrete-choice models, conditional logit uses the fact that one of the two observations in each group is one and the other zero to identify the model (Wooldridge 2002). Furthermore, the fixed effect for each matched pair, c_i , can take on any value and does not necessarily have an expected value of zero. The nonlinear model means that different values of c_i will result in the same change in x_i , having different effects on change in probability of misrepresentation.

We illustrate the relations using the probability a firm has a misrepresentation in a five-year period. Given our annual data estimates, we calculate the probability of a misrepresentation in five years as $1 - (1 - p(\text{misrepresentation in a year}))^5$. We set all the explanatory variables except the one being plotted to

their median values. To illustrate the effects, we chose to include the same value for c_i for all groups and to set c_i such that the average probability of restatement in the sample equaled the average frequency of restatement in the population. Comparing the number of restatements in the GAO sample to the number of listed companies in Compustat, we find an 8.77% probability of misrepresentation by any specific firm in a five-year period. This is similar to, but slightly lower than, the GAO's estimate of the frequency of misrepresentation (845 out of 8,494 firms restating in a five-and-a-half-year period). As such, we set the c_i so that the mean predicted probability across the range of any given explanatory variable is 0.0877 over five years. While we have attempted to adjust these predictions to the actual frequency in the population, a variety of technical issues imply that these predictions serve as illustrations not accurate predictions of probabilities in the population.

Figure 1 plots the predicted probabilities of misrepresentation versus the percentage of compensation as options. Moving from zero options to 100% options (both values found in the sample) increases the probability of misrepresentation from 5.7% to 13%, which more than doubles the probability.

Figure 1 Predicted Probability of Misrepresentation in Five Years vs. Percent of Compensation from Options

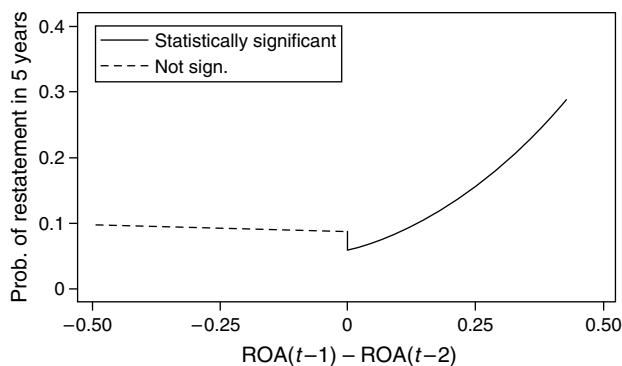


Hypothesis 3 proposes that the probability of misrepresentation will be highest for the lowest (most negative) values of negative social relative performance. Table 3 shows that a firm’s distance below its industry reference group—that is, the magnitude of a firm’s *negative social relative performance*—significantly increases its likelihood of misrepresenting its financial position (parameters of -4.963 , $p < 0.01$; -5.33 , $p < 0.001$; and -3.42 , $p < 0.001$). On the other hand, the results for Hypothesis 4 indicate that the amount a firm’s performance falls below its own prior performance—magnitude of *negative self-relative performance*—only significantly influences misrepresentations when analyzed with the full sample (parameter of 3.77 , $p < 0.001$). Given that the significance of the parameter on *negative self-relative performance* depends on the inclusion of outliers, we interpret the significant parameter estimate with caution. Thus, although the results for social relative performance support Hypothesis 3, those for self-relative performance do not consistently support Hypothesis 4. This supports the idea that, in this context, social relative performance has more influence than self-relative performance.⁸

Figure 2 plots the results for self-relative performance and Figure 3 plots the results for performance compared to the industry. As indicated in Figure 3, moving from the industry reference point to 0.25 below the reference point more than doubles the probability of misrepresentation from 5.8% to 14%. Moving to 0.50 below the reference point increases the probability of misrepresentation to over 40%. The nonlinearity for values above and below zero reflects the logistic assumptions, not a direct estimate of nonlinear effects.

The parameter estimates support Hypothesis 5 for self-relative performance, but not social. The dummy indicating performance above the firm’s own prior performance is statistically significant in all three estimates (coefficients of -0.40 , $p < 0.10$; -0.41 , $p < 0.05$; and -0.65 , $p < 0.001$). As can be seen in Figure 2, moving from just below to just above the firm’s past performance

Figure 2 Predicted Probability of Misrepresentation in Five Years vs. Self-Referent Relative Performance



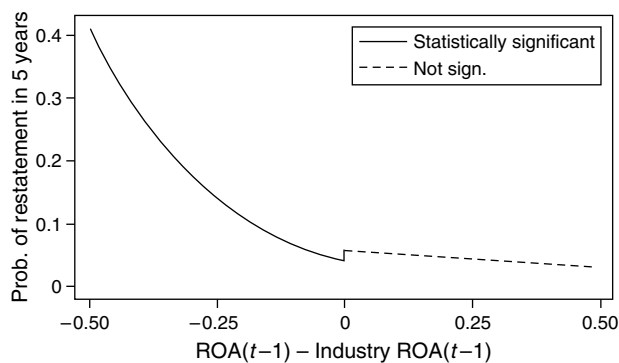
lowers the probability of misrepresentation from 8.8% to 5.9%. With respect to performance relative to industry (social relative performance), all three of the dummy variables are positive, but the only significant estimate, with outliers cut at one, is significant at 0.10. Therefore, Hypothesis 5 is supported for self, but not social, relative performance.

The results offer one substantial surprise—the amounts firms perform above their past levels positively influences misrepresentation probabilities (coefficients of 3.30 , $p < 0.10$; 4.05 , $p < 0.01$; and 3.30 , $p < 0.01$). As shown in Figure 2, moving from the reference point to performance that is 0.25 above the reference point increases the chances of misrepresentation from 5.8% to 15%, which almost triples the chances of misrepresentation. If ROA_{t-2} is 0.50 greater than ROA_{t-1} , the probability of misrepresentation within a five-year period increases to over 35%.

Finally, the log of firm sales positively and significantly influences the probability of misrepresentation (coefficients of 0.33 , $p < 0.05$; 0.33 , $p < 0.05$; and 0.23 , $p < 0.10$). This may reflect that the event firms were slightly larger than the matched firms.

Note that the model offered reasonably high probabilities of misrepresentation for numerous firms. The maximum predicted probability of misrepresentation for

Figure 3 Predicted Probability of Misrepresentation in Five Years vs. Social-Referent Relative Performance



a real firm was 90% within five years, and 36 of the firms had predicted probabilities of misrepresentation over 25%. These firms tended to have high portions of CEO compensation as options, as well as performance well below their industries or well above their own prior performance. Some firms possessed all three factors. However, extreme values on one of the three factors (e.g., performance far below the industry) could also result in a high probability of misrepresentation, even if the other two factors were average.

Further Analysis

The results offer support for three different factors influencing financial misrepresentation in public companies: CEO stock option compensation; low performance relative to the industry; and high performance relative to the historical performance. In this section, we offer two additional analyses that (1) add additional control variables and (2) test for nonlinear relations.

Additional Control Variables

In addition to the primary matched-sample model, we conducted a robustness check that controls for additional alternative explanations. Specifically, we included controls for board independence (CEO/chair duality, outside directors) and corporate governance (outside block shareholders). Because we examine these control variables strictly to rule out possible confounding factors in our primary analysis, and the additional data collection took considerable time, we used a smaller sample with 138 restating and 138 matching firms. We stratified the original sample by size, and then randomly chose firms for this additional data collection so that the subsample roughly matched the size distribution of the original sample.

Board Independence. In theory, boards should monitor managers, preventing them from self-serving actions contrary to the long-term interests of the shareholders. The ability of the board to do so may depend on the independence of the board. We include two common indicators of board independence. First, a dummy variable indicates whether the CEO also serves as board chair (a dual role). When a CEO also acts as board chair, the CEO obtains additional power by leading both corporate management and the board purported to oversee corporate management. Thus, companies with a joint CEO/chair of the board should have weaker board oversight than companies where separate individuals hold the two positions. Second, board members who are not affiliated with the company should have greater freedom to monitor the CEO than board members whose primary employment depends on the CEO. We measure this board independence by the ratio of outside board members to total board members.

Sources of already-compiled data on corporate governance and block holdings emphasize very large firms. Execucomp offers data on CEO-Chair duality, and the “Directors” data set from the Investor Responsibility Research Center offers data on inside versus outside directors. However, many restating firms from our full sample do not appear in these data sets. Where possible, we identified CEOs who also served as the chair using data from Execucomp and the number of outside board members and total board members using the Directors data set from the Investor Responsibility Research Center. We then supplemented these data with data from CompactDisclosure.

Outside Block Ownership. Theoretically, holders of large blocks of stock have strong incentives to encourage good corporate management, and they have voting power to make their opinions heard. Thus, agency theorists argue that having a large portion of the firm’s stock held by outside (unaffiliated) block investors improves monitoring of the firm’s management. We assessed block ownership using two measures: (i) a dummy that equaled one for firms with any outside block ownership in year $t - 1$, and (ii) the fraction of the company’s stock held by outside or institutional block holders in $t - 1$. We used data from the WRDS data repository collected by Dlugosz et al. (2006) where possible, and data from CompactDisclosure for firms not covered by the WRDS data.

CEO Restricted Stock Awards. Although we view restricted stock as an option with a zero exercise price, the terms of a typical restricted stock award might give it different incentive properties than a typical stock option grant. To test this possibility, we separated restricted stock from the valuation of the CEO’s stock option grant, measuring each as a percentage of total annual income (to normalize across firms) in year $t - 1$.

Results. Estimating the extended model using the same conditional logit technique as in the prior estimates resulted in the findings in the final (fifth) column of Table 3. We also reestimated the original model using just the observations used for the extended sample (Column 4). This matches the samples, and so clarifies whether differences between parameter estimates for the original model and the extended model reflect the additional variables or differences in sample. Both estimates use observations that have maximum absolute values of relative performance under 0.5 (similar to Column 1).

The results largely support the previous results. Joint tests of the equality of parameters cannot reject the null hypothesis that the parameters with the additional controls equal those of the original model (Columns 1 to 5, $\chi^2(9) = 10.7$, $p = 0.29$), and when comparing the subsample estimates with the original variables to the estimates with additional controls (Columns 4 to 5,

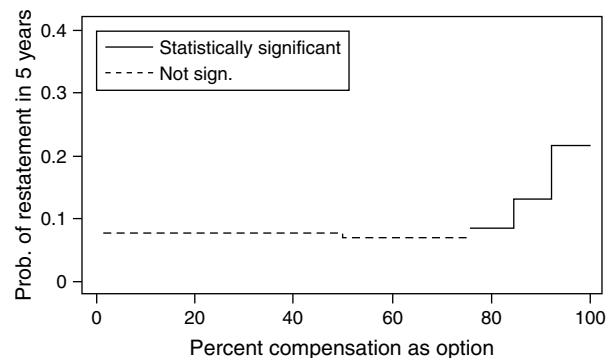
$\chi^2(9) = 2.99$, $p = 0.96$). Furthermore, none of the parameter estimates for the additional control variables reaches statistical significance, and a joint test cannot reject the hypothesis that all the coefficients for additional control variables equal zero ($\chi^2(9) = 2.82$, $p = 0.73$). Comparing each coefficient estimate from the model with additional control variables (Column 5) to the same sample without control variables (Column 4) yielded no statistically significant differences. Comparing each coefficient in the original, larger sample estimation (Column 1, 792 observations) to the model with the additional variables (Column 5, 276 observations) finds only two statistically significant differences. In this comparison, the coefficients on CEO options and CEO bonuses differ between the two estimates ($\chi^2(1) = 3.1$, $p = 0.08$, and $\chi^2(1) = 3.99$, $p = 0.05$); however, the differences are that the CEO options and bonus variables have *larger* coefficients with the governance variables than without.

Thus, the results suggest that the original results hold up even with controls for governance (restricted stock, CEO-Chair duality, and fraction of outside directors), and for outside block ownership (fraction of stock held by institutions, and a dummy for block ownership).⁹ We also checked whether the percentage of options interacted with relative performance in influencing misrepresentations. Each of the six relative performance variables was multiplied by the percentage of options; we then ran the analysis adding these six variables to the set of explanatory variables. A joint test including all the interaction terms cannot reject the hypothesis that all the terms have coefficients of zero ($p = 0.33$). Apparently, relative performance and incentive compensation act independently to influence misrepresentation.

Nonlinear Relations

Incentives and relative performance may have nonlinear influences on restatements. For example, moving from no CEO options to 10% of total compensation via options may influence behavior differently than moving from 50% to 60%, or from 90% to 100%. We checked for nonlinear relationships using dummy variables representing different values of the independent variables. For options and bonuses, we had an omitted dummy for zero and then divided the remaining observations equally into six categories, each representing ranges of the incentive variable (labeled Categories 2 to 7 because one is the omitted dummy for zero). Each bonus dummy accounted for 101 or 102 bonus observations. Each option dummy accounted for between 92 and 94 option observations. The difference in the numbers of observations comes from different numbers of zero values for the two variables. For social relative performance, we combined negative and positive values into one variable and divided it into 16 categories. We omitted the 2 of the 16 dummies representing the categories closest to zero; because

Figure 4 Predicted Probability of Misrepresentation in Five Years for Levels of Option Compensation



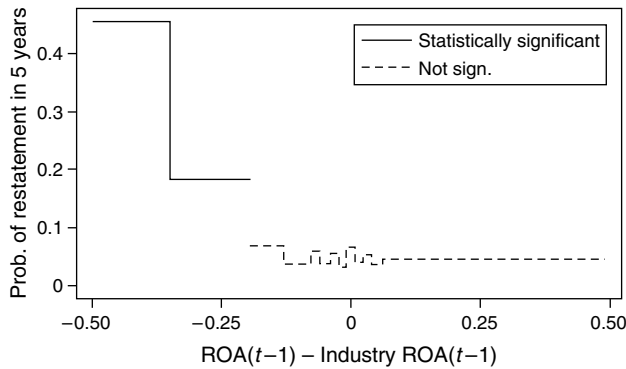
all the other estimates depend on the omitted variable, we wanted more omitted observations to give stability to the results. Each performance dummy accounted for 54 or 55 observations. Similar to the main model, we ran this post hoc analysis with the same limits on relative performance (absolute value less than 0.5, less than 1, and no limit) with similar results.

Given the large number of statistically insignificant coefficients, we have omitted full presentation of the results and will instead discuss them and illustrate them with figures showing the predicted restatement frequency versus the dummy variables. Full results on the nonlinearity estimation are available from the authors.

Three of the six option dummies are significant. Options Dummy 5 includes all observations with 76% to 85% of income as options. Options Dummies 6 and 7 include observations with 85% to 92% and 92% to 100%, respectively. The parameter values increase across the top three categories from 0.51 ($p < 0.10$) to 0.97 ($p < 0.01$) to 1.5 ($p < 0.001$). Figure 4 plots the predicted probabilities of misrepresentation. The probability of misrepresentation is quite stable across most levels of option compensation and then rises rapidly as options comprise more than 76% of compensation. Approximately 33% of the usable sample has greater than 76% of compensation as options. Firms in the top category (over 92% of compensation as options) had a 21% chance of misrepresentation in five years.

Social relative performance also appears to have a nonlinear influence. See Figure 5. The dummy variables for Categories 1 and 2 (the lowest values) have positive and significant parameter estimates (coefficients of 2.25, $p < 0.001$; and 1.10, $p < 0.05$, respectively). The predicted probability of misrepresentation rises rapidly when the firm's performance falls more than 20% below the industry. For an ROA from 0.13 to 0.19 below the industry, the predicted probability of misrepresentation is 6.7%. For an ROA from 0.19 to 0.35 below the industry, the probability of misrepresentation is 18%. For an ROA more than 0.35 below the industry, the predicted probability of misrepresentation rises to 45%.

Figure 5 Predicted Probability of Misrepresentation in Five Years for Levels of Social-Referent Relative Performance



That firms performing substantially below their industry tend to misrepresent financial statements agrees completely with traditional behavioral risk analyses (Bromiley 1991, March and Shapira 1987). Such firms take risks to reach their aspiration levels—the industry’s average performance level. It appears that misrepresentation is an undesirable alternative taken by the most desperate—those who fall well below the industry performance.

Discussion

Focusing on results that are consistent across all the analyses, our results show strong results for two factors that substantially increase the likelihood of financial misrepresentation: extremely low performance relative to average performance in the firm’s industry, and high percentages of CEO compensation paid as stock options.

By testing the effects of self- and social relative performance separately, we find that firm responses to relative performance vary depending on the kind of reference point; the response to performance relative to industry differs from performance relative to one’s prior performance. Some earlier research (e.g., Singh 1986) generally ignored differences between kinds of aspirations. Many studies only considered comparisons to industry averages (Fiegenbaum 1990, Fiegenbaum and Thomas 1986, Gooding et al. 1996, Wiseman and Catanach 1997). Bromiley (1991) and Wiseman and Bromiley (1996) used a composite measure based on industry comparison for firms below their industry, and self comparison for firms above the industry. Greve (2003a) created an aspiration measure as a weighted average of social and self-relative performance. We test social- and self-referent aspirations independently and find that their effects differ. As such, we find that performance relative to different aspiration points can trigger different responses.

The strong empirical effect of underperformance relative to industry builds on the theoretical claim (Cyert and

March 1963/1992) that social relative performance is a key aspiration level—but extends the theory by demonstrating that firms may seek unethical solutions to problemistic search. In other words, the analysis supports the idea that social relative performance matters a great deal, but the data also show that performing below aspirations can produce outcomes that have, until now, been unanticipated in the theory. This has important implications for the behavioral theory of the firm, because it means that problemistic search can lead to financial misrepresentation and its potentially devastating consequences, rather than simply triggering legitimate firm responses that vary along a risk continuum.

The analysis of nonlinear relations also has implications for the behavioral theory of the firm. Behavioral theory argues that relative performance (or attainment discrepancy) influences behavior, and most scholars have modeled the influence as a modified spline function (linear above and below the aspiration level, but with potentially different slopes and intercepts). Our main model followed standard practice and imposed a functional form on the influence of relative performance on behavior. However, the nonlinear analysis demonstrated a substantial departure from the standard functional form. Instead of a smoothly increasing function of relative performance, financial misrepresentation occurred almost exclusively at the extremes.

Whether this applies generally or simply reflects the phenomenon studied here is unclear; we need additional research on such relations. Perhaps managers generally avoid misconduct and only undertake it in extreme situations. For example, managers may exhaust all of their perceived ethical alternatives before misrepresenting; extreme underperformers have the least ability of satisfice by ethical actions, and so the underperformers turn to misrepresentation most frequently. Alternatively, none of the previous research tested for such nonlinearities; perhaps relative performance usually has a nonlinear linear influence. One could imagine some firms ignoring small deviations from aspirations.

The results also indicate that the percentage of CEO compensation delivered via stock option grants significantly influences financial misrepresentation. This, too, has important implications for behavioral theory, specifically with respect to the traditional conception of inducements and contributions. The finding that inducements can lead to misconduct explicitly introduces the idea that unethical action is a readily available choice. That is a complexity in the inducement/contribution relationship that, until now, has remained unexplored and untested. The value of stock options is nonlinear; the option brings no income to the holder at any value below the strike price. This creates a strong incentive to take actions, including improper actions, that promise to raise the market price over the strike price. Our results are consistent with this argument.

Unlike with stock options, we found no significant influence of bonuses on financial misrepresentation. This may reflect that options and bonuses offer different incentives. Options have a highly nonlinear effect, with massive rewards available at high levels of stock price, and nothing below the strike value. Alternatively, bonuses and options offer massively different amounts of compensation in our data. In our sample, the average options grant of \$5,699,512 (median \$677,340) was valued at approximately *twenty times* the average bonus of \$350,000 (median \$111,500). Our nonlinear analysis found that the options influence misrepresentation largely for firms with the highest percentage of compensation in options, primarily the top third of the sample. The average option grant of \$15,100,000 (median \$6,355,347) in the top third of the sample is almost *thirty times* the average bonus of \$543,943 (median \$253,850) for that same top third of the sample. Furthermore, because the effect of stock options on misrepresentation is nonlinear, managers may undertake misrepresentation only in the presence of extremely strong incentives that overpower the downside risk of detection.

The combination of incentive and relative performance outcomes raise important issues for the behavioral theory of the firm. Historically, researchers perceived the theory as predicting incremental, but positive, adaptation. If performance did not change, aspirations rose until it exceeded performance (Simon 1991). The firm would then search for ways to improve. This resulted in a long-run, positive feedback cycle that results in improvements in routines and in the organization's performance.

However, if search can result in corporate misconduct, this positive cycle can be replaced by a pattern of misconduct. Here, we would need to worry about both self-serving misconduct (as indicated by the effect of CEO stock options), and aspirations-driven misconduct. Most work using the behavioral theory of the firm ignores the issues associated with the firm as a coalition, but our results demonstrate the need to attend to the coalition issues. That CEO options strongly encourage dangerous actions like misrepresentation offers an example of a powerful member of the coalition undertaking—for self-serving reasons—actions that put the entire coalition at risk. While our results also reflect cases where the entire coalition might endorse misrepresentation (e.g., after extremely low performance threatens the firm's existence), the influence of CEO stock options indicates self-interest of individuals or smaller groups. In addition, the normal *performance-versus-aspirations-drives-adaptation* argument fails if the actions taken constitute misconduct that addresses appearances rather than substantive change. Our theories and empirical work need to recognize such deviations from our standard assumptions.

While both incentive and relative performance effects occur largely at the extremes (very low relative performance and very high option compensation), they differ in that the firm has control over the incentive structure, but not over its relative performance. Firms with relative performance 0.25 below the industry have massive losses relative to their asset bases. In this case, misrepresentation appears to be a response to desperate conditions not directly under the control of the firm. In contrast, firms choose to offer their executives massive options, so their consequences could be prevented. Additional research on the behavioral determinants of CEO compensation packages merits consideration.

The incentive effects also have important implications for business practice. Joseph Stiglitz suggests that financial misrepresentations were at least partially responsible for distorting the economy of the late 1990s, which continues to cast a pall over the economy today (Meyers 2003). A few experts call for a wholesale change in executive incentive compensation systems. For example, former Federal Reserve Board chairman Paul Volcker concludes that all stock option compensation should be scrapped, due to the almost irrefutable “way options are subject to abuse and temptation” (Cassidy 2002, p 77).

While our research does not attempt to evaluate such prescriptive policy suggestions, it strongly supports the intuition of these critics: Large amounts of stock options substantially increase the likelihood of financial misrepresentation. Furthermore, the effect persists despite corporate governance mechanisms (independent directors on the board, outside block shareholders, etc.) that theorists typically consider important deterrents to corporate improprieties. Our analysis finds no evidence whatsoever that these governance factors reduce the effect of incentive compensation on financial misrepresentation, in contrast to other mixed findings for the effects of governance (e.g., Farber 2005, O'Connor et al. 2006). We also find that governance factors do not minimize the effect of poor performance on financial misrepresentation, and we believe this study has the most complete control for governance effects of any study examining relative performance.

The prevalence of misrepresentation in our sample merits comment. The analyzed sample reveals that a publicly traded company has approximately an 8.77% probability of being caught in a financial misrepresentation during a given five-year period. The full GAO sample (which includes observations we were unable to analyze in our matched-sample design) gives a slightly higher frequency, indicating that approximately 1 in 10 firms had financial misrepresentations during the five-and-a-half years of the GAO analysis. This is a substantial number of corporate misrepresentations, and the rate increased over time. Furthermore, these only include the detected misrepresentations, underestimating the true prevalence. In the study of nonfinancial crimes,

for example, criminologists find that the actual crime rate dramatically exceeds the detected rate. Although one cannot directly infer what this might mean for financial misrepresentation, the 8.77% probability constitutes a conservative, underestimated floor for the actual prevalence of financial misrepresentation. Note also that some firms had a much higher likelihood of misrepresentation—some with probabilities of over 25% in a five-year period.

This work has several limitations. First, we examined the effect of social and self-relative performance computed in the years immediately before the year of misrepresentation, but the operative performance comparisons might be triggered in the *same* year in which the misrepresentation occurs. Unsatisfactory financial outcomes in a given period may trigger misrepresentation of the numbers for that very reporting period; alternatively, poor performance in the first quarter might trigger misrepresentations in later quarters in the same year. This means that a misrepresentation might happen at the same time as undesirable real, but not yet reported, annual earnings. Our analysis assumes a lag between the undesirable performance and the financial misrepresenting.

Second, our study omits a variety of complex—but potentially interesting—incentive data. Factors such as cumulative stock holdings of the top managers (whether stock shares or prior option grants), long-term incentive plan (LTIP) valuations, golden parachute contracts, and the firms' option-repricing histories would all be fascinating additions to a study of incentives and financial misrepresentation.

In addition to addressing these limitations, future work could extend this study in several ways. Research could examine whether misrepresentation behaviors differ across industries; for example, financial misrepresentations may be easier to disguise in rapidly changing industries, such as the energy or technology sectors, than in more traditional, well-defined industries. Industry- or firm-based managerial cultures may also influence the probability of misrepresentation.

Conclusion

This study has provided insights into the role of top management incentives and firm performance in influencing financial misrepresentations. We have supported empirically the argument that executive inducements and poor relative firm performance provide pressures that can lead firms to act unethically. The study has practical implications for corporate managers and boards, and theoretical implications for the behavioral theory of the firm, and by extension, management theory in general. Our analysis suggests that theoretical arguments must explicitly include the possibility of organizational impropriety so that researchers can more effectively and accurately understand the mechanisms of corporate behavior and governance.

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Endnotes

¹In a bounded rationality model, this could take the form of either an assumption that managers have a general preference for ethical behavior, or a set of routines that include a general rule of honest behavior.

²Although in this paper we offer arguments that assume bounded rationality, a rational agent model can also predict that incentives lead to misconduct. While the conventional agency-theoretic wisdom supports using stock options to “align” the incentives of management and shareholders and solve governance problems (e.g., Shleifer and Vishny 1997), some agency scholars have begun to acknowledge the possibility of the adverse effects that we empirically examine in this study. For example, Bebchuk and Fried (2003) suggest that, although most view incentive compensation for executives as a solution to the agency problem, it can actually serve to exacerbate the agency problem. Even early advocates of stock option pay for executives, Jensen and Murphy (1990), now recognize the potential for equity-based incentives to make the agency problem “worse, not better” (Jensen and Murphy 2004, p. 47).

³For instance, after many years of consistent performance well above its industry, a firm probably does not aspire to perform below its historical performance. Likewise, a firm with performance well below the industry probably aspires to at least industry average performance.

⁴This approach is commonly used in epidemiology (e.g., Holford 2002, Sheeche 1962). The GAO sample provides a set of firms that have the behavior of interest: income restatement. We cannot generate the variables of interest for *all* firms, and the ones with readily available data constitute a biased sample. Faced with a similar problem in diseases and treatments, epidemiologists select a matched sample that matches each observation possessing the phenomenon of interest with a similar observation without the phenomenon.

⁵In a few cases, the closest-sized firm in a particular industry still differed substantially in sales magnitude from that of the restatement firm. If sales differed by a factor approaching 10, we dropped the pair from the sample due to their dissimilarity

in size. In addition, some industries had so many restatements that we could not find firms without restatements to match all the restatement firms.

⁶Firms can value stock options in two different ways, which makes the reported values in proxy statements difficult to compare. According to SEC regulations (SEC 1992), public firms may value stock option grants using either a standard growth model (at 5%, 10%, or both), or the Black-Scholes option-pricing model. The 10% growth model calculates the projected future value of the stock options granted by assuming 10% compounded annual growth in stock price over the term of the option, less the exercise price, times the number of options granted. Because Black-Scholes requires firm-specific assumptions and can be varied in its implementation across firms, the growth model is more uniformly comparable.

⁷We analyzed several different ways to calculate aspiration levels, including the more complex weighted-average models and estimations that blended self and social aspirations into one composite aspiration measure. We found that measuring the effects of self- and social relative performance separately presented the best fit. For self-relative performance, the model that we present here (focusing on performance in the most immediate prior year rather than using a multiyear weighted average) fit the data best, consistent with the idea that misrepresentation is likely to be an emergent choice rather than a long-term strategic choice. The additional analysis is available from the authors.

⁸Studies that blend social and self-relative performance into one composite measure typically weight social relative performance more heavily than self-relative performance. For instance, Greve (2003a) weights social aspirations at 0.8 and self-referent aspirations at 0.2. Therefore, it is not entirely surprising in our study to find a consistently strong effect for only social relative performance.

⁹We performed an additional analysis that controlled for other potential influences (such as CFO incentive compensation), and other governance measures (such as ESOP block holdings). This robustness check used all the firms for which we could obtain full data in the WRDS sources, a sample of 52 restatements and 2,771 other observations. These estimates suffered from substantial sample-selection bias. The parameters estimation used logit. None of the additional variables—including CFO incentives—had statistically significant parameter estimates, and the primary results of the original analysis held. Given statistical problems and space limitations, we have excluded it here, but it is available from the authors.

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