Essays on the Role of Managerial Type in Financial Reporting

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Proefschrift

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to my teachers

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Chapter 1: Introduction

1.1 Research question

The main focus of this dissertation is to examine whether and how individual managerial differences and their social context affect earnings quality.

Earnings quality, as an important component of financial reporting quality, is of considerable interest to financial information users, standard setters, regulators as well as accounting researchers (Francis, Olsson, and Schipper 2006). Extant research on earnings quality has studied the determinants of earnings quality, including innate factors originating from fundamental economic forces, and discretionary factors (Lev 1983; Dechow and Dichev 2002; Francis, LaFond, Olsson, and Schipper 2004).

Innate factors such as firm size, cash flow variability, sales variability, operating cycle, firm's incidence of negative earnings realizations, intangible intensity, capital intensity and industry can account for between 50%-70% of the variation in the earnings quality metric (e.g., see Dechow and Dichev 2002; Francis et al. 2006; Francis, Nanda, and Olsson 2008). Turning to discretionary factors, researchers find that the following influence earnings quality:[1] manager's incentives (e.g, see DeFond and Jiambalvo 1994; Burgstahler and Dichev 1997; Degeorge, Patel, and Zeckhauser 1999; Baker, Collins, and Reitenga 2003; Bartov and Mohanram 2004; Graham, Harvey, and Rajgopal 2005; McAnally, Srivastava, and Weaver 2008), corporate governance structure (e.g., see Dechow, Sloan, and Sweeney 1996; Bushman and Smith 2001; Fan and Wong 2002; Klein 2002; Wang 2006; Bowen, Rajgopal, and Venkatachalam 2008), auditing (e.g., see Wild 1996; Teoh, Welch, and Wong 1998), regulation and investor protection (e.g., see Leuz, Nanda, and Wysocki 2003; Cohen, Dey, and Lys 2008; Francis and Wang 2008).

Together all these studies have contributed significantly to the literature and have advanced our understanding about the determinants of earnings quality; however, substantial variation in firm reporting practices remains after controlling for these identified economic determinants (Bowen et al. 2008; Francis, Huang, Rajgopal, and Zang 2008).

[1] References listed here are just for illustrative purpose; please refer each of the individual chapters for a more complete bibliography.

One of the fruitful research avenues to tackle this question further is to consider the influence of managers in more detail, especially the individual differences between those managers involved in reporting and the influence of peer managers as a proxy for the social context of managers (Noreen 1988; Luft 1997; Sprinkle 2003; Huddart and Fischer 2008). Individual differences are often defined in terms of personal preferences for honesty, ethics and social values etc. (Van Lange, Otten, De Bruin, and Joireman 1997; Fehr and Schmidt 1999; Evans, Hannan, Krishnan, and Moser 2001; Stevens 2002). While peer influence is largely unexplored in accounting context, its influence on managerial reporting is likely given both anecdotal evidence[2] and prior work in other fields (see, e.g., Bernheim 1994; Barron and Gjerde 1997; Slemrod 2004; Huddart and Fischer 2008).

1.2 Research method

In this dissertation, I employ both experimental and archival data research methods and measure my variables of interests in multiple ways. The reasons for these choices follow.

First, for this exploratory study, existing and purpose developed proxies for earnings quality and for the influence of managers may contain measurement error especially when based on archival data — the direct consequence is that a causal relationship between dependent and independent variables cannot be ensured and statistical results suffer from attenuation bias. Using an experimental approach can overcome these weaknesses (Sprinkle 2003). But experiments also may not capture all relevant aspects of the population and thus have the problem of generalizing results to non-laboratory conditions (Luft 1997; Sprinkle 2003). Cognizant of these problems, I first run an experiment to study how managerial types together with other variables influence managerial reporting behavior and then use archival data to investigate whether managers who reveal certain traits indeed show significant influence on their financial reporting choices.

Second, there is no consensus on how to define and measure earnings quality and the influence of managers (individual differences as well as peer behavior). Earnings quality is generally defined from different user perspectives. In order to get a more

[2] In a broader sense, peer-group behavior can lead to a corporate culture that is either benign or malignant. The documentary "The smartest guys in the room" on the ENRON affair suggests that this firm was rife with unethical behavior. Being dishonest was the norm and deviating from this behavior would have rendered an individual manager an outcast.

comprehensive measure of earnings quality, I measure earnings quality in multiple ways. In Chapter 2, using an experimental approach, I measure earnings quality *directly* by the extent of truthfulness in managerial reporting. In Chapter 3, following Francis et al. (2004), I use seven measures of earnings quality (which they define as earnings attributes). In the same chapter, I also use quality diagnostic tests based on accounting ratios adopted from Penman (2007). In Chapter 4, from an earnings management perspective, I examine earnings quality as managerial reporting behavior *vis-a-vis* earnings benchmarks (e.g, positive earnings, last year's earnings and analysts' expectations). Turning to my independent variables, in Chapter 2, as the main variable of interest, the peer managers influence is manipulated and measured *directly;* individual differences of managers are measured according to social value orientation scores developed by prior researchers (Van Lange et al. 1997; Fehr and Schmidt 1999; Fehr and Schmidt 2003; Handgraaf, Dijk, Wilke, and Vermunt 2004). In Chapter 3 and 4, the context of the stock option backdating scandal is used to identify individual differences of managers.

Though the main focus of this dissertation is to investigate the influence of managers on earnings quality, I also try to shed light on the validity and consistency of earnings quality measures and on the effect of other factors on earnings quality, such as incentive compensation and audit effectiveness.

1.3 A preview of the main findings

Chapter 2 is entitled *Honesty is the best policy—when there is money in it: can firms promote honest reporting behavior by managers?* This study provides experimental evidence on how incentive compensation, peer managers behavior, and audit team effectiveness influence managerial reporting behavior. The results show that an increase in incentive compensation intensity induces subjects to report less truthfully, a high level of peer honesty promotes truthful reporting (this effect is weaker, however, when incentive compensation intensity is high), and audit team effectiveness shows no significant influence on reporting behavior. Pro-self managers, as classified according to social value orientation scores, always report less truthfully compared with pro-social managers.

Chapter 3 is entitled *Top level executive characteristics and earnings attributes*. I use the context of the stock option backdating scandal to explore how individual manager differences affect the quality of financial statements. I argue that the

revealed type of "backdating" managers is such that they will have lower earnings quality. Using earnings attributes described in Francis et al. (2004), I document indeed "backdating" firms have lower accrual quality, smoothness, and timeliness. However, I also find that "backdating" firms have higher persistence, predictability, and conservatism. In an effort to resolve some of the ambiguity from the earnings attributes tests, I compare accounting-based ratios that have been identified in prior work as quality diagnostics between "backdating" firms and size and industry matched competitor firms. I show that based on these quality diagnostics, "backdating" firms book revenues more aggressively, have low expenses compared with their sales activities, report higher profit margins and lower asset turnover. Together, the accounting quality of "backdating" firms is significantly lower than the quality of their peers. I conclude that individual differences of top managers are a significant explanatory factor for the reporting behavior of firms.

Chapter 4 is entitled *To miss or to meet earnings benchmarks? Earnings management of firms involved in stock option backdating*. Prior literature provides evidence that managers have incentives to meet or beat some earnings benchmarks and are being rewarded by markets for doing so (Lopez and Rees 2002; Skinner and Sloan 2002). Managers also have incentives to miss their earnings targets for the benefit of lower strike prices on subsequent option grants (McAnally, Srivastava, and Weaver 2008). Controlling for firms' economic fundamentals, both just meeting/beating and just missing earnings benchmarks are consistent with earnings management and may bring negative consequences to other stakeholders. I expect managers who illegally backdated their option grants are less concerned about the negative consequence on other stakeholders of the company and are more likely to just meet/beat or just miss earnings target. I find that "backdating" firms are more likely to meet or narrowly beat all three earnings benchmarks examined in the paper: positive earnings, last year's earnings and analysts' forecasts. Contrary to my expectations, they are less likely to miss analysts' forecasts. The evidence is consistent with the observations that "backdating" managers try to meet the stakeholders' expectations and avoid costly litigation that could potentially be triggered by unfavorable earnings surprises (Bartov, Givoly, and Hayn 2002).

1.4 Discussion, limitations and future research

To summarize the results from the three essays: *in addition to* those innate and discretionary factors which are identified in prior work, both peer influence and individual managerial differences are important determinants of firms' earnings quality. The overall results show that managers who are less concerned about the welfare of other people are more likely to engage in earnings management and have worse earnings quality.

These findings have to be considered in the light of the limitations that are inherent in empirical work. First, the concept of "managerial differences" is multi-faceted and can be operationalized in many ways. This study defines managerial differences based on whether managers are concerned about the negative consequence of their own behaviors to other people. This definition may not fully reflect the relevant dimensions of managerial dispositions with regard to their reporting behavior. While the approach I offer in the two archival studies has the benefit of admitting broad-sample empirical analyses, future researchers may wish to use more refined measures of managerial type (differences).

Second, I exploit a unique setting in my archival studies which allows for some powerful tests. At the same time, one important limitation is that managerial differences are measured ex post, as "revealed behavior". Relying on revealed behavior is somewhat problematic as—in my setting—it implies that I have to use a sub sample of managers who have demonstrated "extreme behavior", i.e., those who are under investigation of fraud. It is not clear whether the behavior of these managers is very representative and can be used to answer questions about the influence of managerial type of a typical manager on reporting choices. An alternative approach would be to measure managerial differences ex ante, for example by using established survey instruments, but a survey approach often suffers from social desirability bias (Ganster, Hennessey, and Luthans 1983). Social desirability refers to people's tendency to present themselves in a manner that will be viewed favorably by others. This bias is more likely given my research question.

Third, the main conclusion is that managers who are involved in "backdating" are significantly associated with worse earnings quality in terms of many of the well accepted measures, but for some earnings quality measures, it appears that the earnings quality of these "backdating" managers is actually not worse than that of other firms, and sometimes even better. These mixed findings have to be interpreted

in the light of the fundamental debate about the validity of the extant measure of earnings quality (McNichols 2002; Durtschi and Easton 2005, 2008). This debate is one of the reasons why I use multiple measures of earnings quality. In the current setting, we have strong priors that "backdating" managers are prone to manage earnings. Given these priors, earnings attributes that behave in line with my priors about the predictions of these managers are easier to accept as valid proxies for earnings management. Thus, my results have a bearing on which of these contested measures of earnings quality are valid.

1.5 References

Baker, T., D. Collins, and A. Reitenga. 2003. Stock Option Compensation and Earnings Management Incentives. *Journal of Accounting, Auditing & Finance* 18 (4):557-582.

Barron, J. M., and K. P. Gjerde. 1997. Peer Pressure in an Agency Relationship. *Journal of Labor Economics* 15 (2):234-254.

Bartov, E., D. Givoly, and C. Hayn. 2002. The Rewards to Meeting or Beating Earnings Expectations. *Journal of Accounting and Economics* 33 (2):173-204.

Bartov, E., and P. Mohanram. 2004. Private Information, Earnings Manipulations, and Executive Stock-Option Exercises. *The Accounting Review* 79 (4):889-920.

Bernheim, B. D. 1994. A Theory of Conformity. *Journal of Political Economy* 102 (5):841-877.

Bowen, R., S. Rajgopal, and M. Venkatachalam. 2008. Accounting Discretion, Corporate Governance, and Firm Performance. *Contemporary Accounting Research* 25 (2):351-406.

Burgstahler, D., and I. Dichev. 1997. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting & Economics* 24 (1):99-126.

Bushman, R. M., and A. J. Smith. 2001. Financial Accounting Information and Corporate Governance. *Journal of Accounting & Economics* 32 (1-3):237-333.

Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods. *The Accounting Review* 83 (3):p. 757-787.

Dechow, P. M., and I. D. Dichev. 2002. The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review* 77 (s-1):35-59.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1996. Causes and Consequences of Earnings Manipulations: An Analysis of Firms Subject to Enforcement Actions by the Sec. *Contemporary Accounting Research* 13 (1):1-36.

DeFond, M.-L., and J. Jiambalvo. 1994. Debt Covenant Violation and Manipulation of Accruals. *Journal of Accounting and Economics* 17 (1-2):145.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings Management to Exceed Thresholds. *The Journal of Business* 72 (1):1-33.

Durtschi, C., and P. Easton. 2005. Earnings Management? The Shapes of the Frequency Distributions of Earnings Metrics Are Not Evidence Ipso Facto. *Journal of Accounting Research* 43 (4):557-592.

———. 2008. Earnings Management? Averaging, Sample Selection Bias, and Scaling Lead to Erroneous Inferences, Working paper, University of Notre Dame.

Evans, J. H. I., R. L. Hannan, R. Krishnan, and D. V. Moser. 2001. Honesty in Managerial Reporting. *The Accounting Review* 76 (4):537-559.

Fan, J. P. H., and T. J. Wong. 2002. Corporate Ownership Structure and the Informativeness of Accounting Earnings in East Asia. *Journal of Accounting & Economics* 33 (3):p. 401-425.

Fehr, E., and K. M. Schmidt. 1999. A Theory of Fairness, Competition, and Cooperation. *The Quarterly Journal of Economics* 114 (3):817-868.

———. 2003. Theories of Fairness and Reciprocity- Evidence and Economic Applications. In *Advances in Economics and Econometrics, Econometric*

Society Monographs, Eighth World Congress, edited by M. Dewatripont, L. P. Hansen and S. J. Turnovsky, 208-257.

Francis, J.-R., and D. Wang. 2008. The Joint Effect of Investor Protection and Big 4 Audits on Earnings Quality around the World. *Contemporary Accounting Research* 25 (1):157-191.

Francis, J., A.-H. Huang, S. Rajgopal, and A.-Y. Zang. 2008. CEO Reputation and Earnings Quality. *Contemporary Accounting Research/Recherche Comptable Contemporaine* 25 (1):109-147.

Francis, J., R. LaFond, P. M. Olsson, and K. Schipper. 2004. Costs of Equity and Earnings Attributes. *The Accounting Review* 79 (4):967-1010.

Francis, J., D. Nanda, and P. Olsson. 2008. Voluntary Disclosure, Earnings Quality, and Cost of Capital. *Journal of Accounting Research* 46 (1):53-99.

Francis, J., P. Olsson, and K. Schipper. 2006. Earnings Quality. *Foundations and Trends in Accounting* 1 (4):259-340.

Ganster, D. C., H. W. Hennessey, and F. Luthans. 1983. Social Desirability Response Effects: Three Alternative Models. *Academy of Management Journal* 26:p. 321–331.

Graham, J.-R., C.-R. Harvey, and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40 (1-3):3-73.

Handgraaf, M. J. J., E. v. Dijk, H. A. M. Wilke, and R. C. Vermunt. 2004. Evaluability of Outcomes in Ultimatum Bargaining. *Organizational Behavior and Human Decision Processes* 95 (1):97-106.

Huddart, S. J., and P. E. Fischer. 2008. Optimal Contracting with Endogenous Social Norms. *American Economic Review, Forthcoming*.

Klein, A. 2002. Audit Committee, Board of Director Characteristics, and Earnings Management. *Journal of Accounting & Economics* 33 (3):p. 375-4000.

Leuz, C., D. Nanda, and P. D. Wysocki. 2003. Earnings Management and Investor Protection: An International Comparison. *Journal of Financial Economics* 69 (3):p. 505-527.

Lev, B. 1983. Some Economic Determinants of Time-Series Properties of Earnings. *Journal of Accounting and Economics* 5:31.

Lopez, T., and L. Rees. 2002. The Effect of Beating and Missing Analysts' Forecasts on the Information Content of Unexpected Earnings. *Journal of Accounting, Auditing & Finance* 17 (2):155-184.

Luft, J. L. 1997. Fairness, Ethics and the Effect of Management Accounting on Transaction Costs. *Journal of Management Accounting Research* 9:199-216.

McAnally, M. L., A. Srivastava, and C. D. Weaver. 2008. Executive Stock Options, Missed Earnings Targets and Earnings Management. *The Accounting Review* 83 (1):185-216.

McNichols, M. F. 2002. Discussion of the Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review* 77 (s-1):61-69.

Noreen, E. 1988. The Economics of Ethics: A New Perspective on Agency Theory. *Accounting, Organizations and Society* 13:359–369.

Penman, S. H. 2007. *Financial Statement Analysis and Security Valuation*. Boston [etc.]: McGraw-Hill Irwin.

Skinner, D. J., and R. G. Sloan. 2002. Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio. *Review of Accounting Studies* 7 (2-3):289-312.

Slemrod, J. 2004. The Economics of Corporate Tax Selfishness. *National Tax Journal* 57 (4):877-899.

Sprinkle, G. B. 2003. Perspectives on Experimental Research in Managerial Accounting. *Accounting, Organizations and Society* 28 (2-3):287-318.

Stevens, D. E. 2002. The Effects of Reputation and Ethics on Budgetary Slack. *Journal of Management Accounting Research* 14:153-171.

Teoh, S. H., I. Welch, and T. J. Wong. 1998. Earnings Management and the Long--Run Market Performance of Initial Public Offerings. *The Journal of Finance* 53 (6):p. 1935-1974.

Van Lange, P. A. M., W. Otten, E. M. N. De Bruin, and J. A. Joireman. 1997. Development of Prosocial, Individualistic, and Competitive Orientations: Theory and Preliminary Evidence. *Journal of Personality and Social Psychology* 73 (4):733-746.

Wang, D. 2006. Founding Family Ownership and Earnings Quality. *Journal of Accounting Research* 44 (3):619-656.

Wild, J.-J. 1996. The Audit Committee and Earnings Quality. *Journal of Accounting, Auditing and Finance* 11 (2):247-276.

Chapter 2: Honesty Is the Best Policy–When There Is Money in It [*] : Can Firms Promote Honest Reporting Behavior by Managers? [†]

2.1 Introduction

Accounting regulators, investors, and media pundits alike have expressed growing concern about the apparent lack of honesty in firms' financial reports. Given the many cases in which managers allegedly acted unethically, committed fraud, or simply did not reveal the full truth, the main question is: what can be done to ensure that managers report truthfully? In this paper I investigate in an experimental setting how incentive compensation, peer-group behavior, and audit team effectiveness influence managerial reporting.

As an interest-alignment tool between managers and firms, incentive compensation attracts a lot of attention. Recently, several authors (Bruner, McKee, and Santore 2005; Bergstresser and Philippon 2006; Denis, Hanouna, and Sarin 2006) have suggested that high incentive intensity may cause undesired reporting behavior within the legal boundary and even beyond (e.g., earnings management and fraudulent reporting). However, other researchers (e.g., Erickson, Hanlon, and Maydew 2006) find no consistent evidence that incentive compensation is associated with accounting fraud. Given its popularity and importance in practice and the mixed results in earlier research, more evidence regarding incentive compensation's potential to cause undesirable reporting behavior is warranted.

Accounting researchers have also explored and identified a number of behavioral factors that can promote the truthfulness of managerial reporting (e.g., Chow, Cooper, and Waller 1988; Evans et al. 2001; Stevens 2002; Stevens and Thevaranjan 2003; Yu 2004; Stevens and Thevaranjan 2005; Hannan, Rankin, and Towry 2006). However,

[*] Mark Twain: Speech to Eastman College (1901)

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among the mechanisms considered, little attention has been given to the influence of peer-group reporting behavior on managerial honesty. Such a relation is likely given both anecdotal evidence and prior work in other fields (see, e.g., Bernheim 1994; Barron and Gjerde 1997; Slemrod 2004; Huddart and Fischer 2008). Accordingly, I examine whether peer-group behavior affects the extent of honesty observed in managerial reporting.

Note that if one only examines the role of peer behavior, and ignores the role of more formal governance mechanisms such as audit committees, board monitoring, etc., the role of peer groups may be overstated (Sprinkle 2003).[5] I therefore include a formal governance mechanism in the analysis, which I operationalize in terms of audit team effectiveness.

I use audit team effectiveness as my proxy for formal governance for two reasons. First, internal audit teams, viewed as the eyes and ears of a firm's audit committee, are commonly used corporate governance mechanisms in practice; one of their most important functions is to assist the audit committee in fulfilling its oversight responsibilities with respect to the integrity of the company's financial statement: "…the U.S. Congress place a great reliance on the company's audit committee as a means of protecting the integrity of financial reporting" (Carcello, Hollingsworth, Klein, and Neal 2006, 1). Second, the evidence on the relation between governance practice effectiveness and financial reporting behavior is mixed. On the one hand, some researchers (Peasnell, Pope, and Young 2000; Chtourou, Bedard, and Courteau 2001; Klein 2002; Xie, Davidson, and DaDalt 2003; Carcello et al. 2006) find that an effective board and audit committee (in terms of board composition, board independence, and members' financial sophistication) constrains earnings management activities. On the other hand, Bowen et al. (2005) find that there is no clear evidence that poor governance quality is related to managerial accounting discretion. These conflicting results may be partly explained by the measurement of audit effectiveness and managerial accounting discretion. By using an experimental setting, I can measure more directly audit team effectiveness and its impact on the extent of misreporting.

Turning to the experiment's design, I conduct an experiment in which subjects report a cost number to upper management. Management only knows the range for

[5] Sprinkle (2003) suggests that social ethical environment should be studied together with formal governance mechanisms.

this number, while subjects know the true cost. Subjects are paid based on a division's profit, which is defined as the difference between output value and the reported cost of the project, creating an incentive to underreport the cost. The dependent variable is (the degree of) honesty in a manager's report,[6] i.e., the extent to which a report accurately reflects the true costs (Evans et al. 2001; Hannan 2005; Hannan et al. 2006). Incentive compensation intensity is a within-subject factor; subjects receive either 50% or 10% of a division's reported profit. The other two governance mechanisms studied are between-subject factors. Peer-group behavior is manipulated such that peers are associated with either a high or a low level of honest reporting. Audit team effectiveness is manipulated such that the detection probability for misreporting is twice as high in the high effectiveness setting as in the low effectiveness setting. Finally, I control for subjects' gender and social value orientation (SVO) score in the analysis. SVO is known to influence an individual behavior's in payoff distribution settings. Based on SVO scores, subjects are classified into pro-selves and pro-socials, where pro-selves are more concerned about their own outcomes, whereas pro-socials are concerned about the well-being of others.

The results suggest that, although people are quite truthful in making their reporting decisions, there are incentives to misrepresent costs (in order to maximize compensation). Specifically, I find that managerial honesty decreases with incentive compensation intensity (i.e., managerial honesty is lower under a 50% incentive compensation scheme than under a 10% scheme). Managerial honesty is significantly higher, however, when subjects observe that the majority (75% to 90%) of their peers are honest. More importantly, the results show that these mechanisms interact with each other, with the effect of peer reporting behavior *smaller* when incentive intensity is high. With respect to audit team effectiveness, I find that this factor does not affect managerial honesty. Finally, I find that pro-social managers always make more honest reports than pro-self managers; and I also find that male participants tend to underreport true costs more than women when facing higher incentive intensity.

This paper's primary contributions to the literature are as follows. First, while the three main factors of interest capture many of the mechanisms that have been put forward by regulators and academics to promote honest reporting behavior, to date

[6] In this setting, managerial honesty is directly related to the manager's own payoff and to a firm's profit, as the manager's compensation is subtracted from firm profit.

there is only limited empirical evidence on their effects. Thus, this paper adds to our knowledge on these factors' impact on managerial reporting.

Second, while several recent papers make considerable contributions toward integrating the insights of both economics and the behavioral sciences into accounting theories (see, e.g., Young 1985; Chow et al. 1988; Evans et al. 2001; Stevens 2002; Stevens and Thevaranjan 2003; Yu 2004) – an effort that is increasingly important following Evans et al.'s (2001) finding that neither conventional agency models nor types models[7] can explain reports that are "partially honest" – we know little about how managers balance their monetary and non-monetary considerations when deciding on the extent to which they will report honestly (Luft 1997; Evans et al. 2001; Sprinkle 2003). By analyzing both monetary (incentive compensation intensity) and non-monetary (peer-group behavior and audit team effectiveness) governance mechanisms, this paper adds to the literature by investigating their possibly interactive influences on managerial reporting behavior. To the best of my knowledge, this is the first paper to study such interactive effects.

Third, the results reveal that research on truthful managerial reporting may encounter an omitted variable bias without controlling for individual differences such as SVO and gender, since these variables do affect reporting behavior.

2.2 Hypothesis development

In this section I begin by discussing my hypothesis for incentive compensation intensity. I then develop testable predictions for the two non-monetary governance mechanisms of interest, namely, peer honesty and audit team effectiveness. The third part of this section focuses on the interactive effects between incentive intensity and non-monetary governance mechanisms. Finally, I explain the control variables.

2.2.1 Incentive compensation intensity

Incentive compensation, generally thought to be effective in encouraging and motivating managers to work harder, is commonly used in an effort to mitigate conflicts of interest between principals and managers. However, managers may also be motivated to increase their compensation at the expense of the firm. The more

[7] "Partially honest" reports are reports that are neither purely wealth maximizing nor purely honest. In agency models, an agent is assumed to maximize his or her utility function, which depends only on the individual's consumption. In types models, people are assumed to be either ethical or not ethical (purely self-interested), where ethical agents always tell the truth, regardless of the cost, whereas self-interested agents will always cheat in order to maximize wealth.

incentive-intensive compensation is, the higher the payoff from manipulating firm performance measures. Consistent with this argument, Bergstresser and Philippon (2006) provide evidence that companies with more "incentivized" CEOs observe higher levels of earnings management. In an experimental setting, Bruner et al. (2005) also find the amount of managerial fraud committed by subjects is positively correlated with the (equity) incentive compensation of managers. However, Erickson et al. (2006) compare executive (equity) incentive compensation of firms accused of accounting fraud by the Securities and Exchange Commission (SEC) during the period 1996-2003 with two samples of firms not accused of fraud and find no evidence to support the conjecture that (equity) incentive compensation is associated with fraud. Given the balance of evidence that incentive compensation has a negative effect on the truthfulness of managerial reports, I hypothesize that:

H1. *The truthfulness of a manager's report is negatively influenced by incentive compensation intensity.*

2.2.2 Non-monetary governance mechanisms

Peer managers' reporting behavior: Both psychologists and economists believe that individuals conform to behavioral norms established by their peers' actions. According to this view, much of one's behavior is influenced by his or her perceptions of what is "normal" or "typical". The reason is that individuals incur a lower cost (e.g., feelings of guilt or loss of self-respect) in undertaking an undesirable action when other individuals undertake the undesirable action as well (Rotter 1966; Kohlberg 1984; Huddart and Fischer 2008).

While no study to date has examined directly the relation between peer managers' behavior and truthful reporting, evidence in other fields is suggestive of the influence of peers. For example, tax compliance researchers (Jackson and Milliron 1989; Trivedi, Shehata, and Lynn 2003) find that highly non-compliant peers reduce the compliance of other taxpayers, Zey-Ferrell et al. (1979) show that unethical decision-making by marketing managers is influenced by peer behavior, and Huddart and Fischer (2008) show how "established norms" or "peer pressure" can influence an individual's (un)desirable actions (i.e., earnings manipulation by managers). Given this evidence, I hypothesize that:

H2. *The truthfulness of a manager's report is higher when peers report truthfully.*

Audit team effectiveness: In essence, an internal audit is a costly investigation aimed at countering opportunism and reducing the information asymmetry of managers vis-à-vis firm headquarters (Baiman 1990; Penno 1990; Baiman, Evans, and Nagarajan 1991; Boyle 1993; Kachelmeier and Shehata 1997). The internal auditing process typically consists of two potential stages. In the first stage, the audit team seeks to detect any opportunistic behavior; in the event opportunism is detected, a penalty may be considered in the second stage. I focus on the first stage and examine whether auditing effectiveness alone is sufficient to prevent opportunistic behavior.

Studies on information systems are typically categorized according to whether they analyze pre- or post-decision information (Baiman and Evans 1983; Baiman and Sivaramakrishnan 1991). [8] In the setting considered in this paper, increasing the detection probability reduces the ex-post information asymmetry between managers and headquarters—it is only possible to establish whether managers have reported truthfully after they make their reports. While several studies investigate the effect of pre-decision information asymmetry between managers and headquarters on budgetary slack and find mixed evidence (Young 1985; Chow et al. 1988; Stevens 2002; Hannan et al. 2006), no extant evidence exists regarding ex-post information asymmetry. In the absence of prior evidence on this type of information asymmetry, I predict that increased audit effectiveness increases the probability that untruthful reporting will be detected and in turn reduces (post-decision) information asymmetry, leading managers to report more truthfully. More formally:

H3. *Audit team effectiveness has a positive effect on the truthfulness of managerial reporting.*

2.2.3 Interactive effects

Koford and Penno (1992) argue that whether a person behaves ethically depends, to some extent, on how that person balances their self-interest against the interest of others or against some moral standards. Brickley et al. (1997) argue that the level of

[8] Pre-decision information is information on which individuals can base their decisions. Conversely, post-decision information cannot be used for decision making because it arrives after the decision has been implemented (Baiman and Sivaramakrishnan, 1991, 747).

honesty declines as the payoff to lying increases. These arguments suggest the presence of interactive effects between incentive compensation and the other two governance mechanisms examined in this paper.

Consistent with these views, managers trade off their own wealth and the desire to behave the same as their peers when their peers report truthfully. With highly incentive-intensive contracts, the costs of following one's peers are higher since doing so requires forgoing larger amounts of money. Accordingly, I predict that managers will be less likely to follow their honest peers when they have highly incentive-intensive contracts.

Turning to the interaction between incentive compensation intensity and audit team effectiveness, I also expect that the effect of audit team effectiveness on truthful managerial reporting will be lower under stronger monetary incentives. Hannan et al. (2006) argue that a manager's reporting decisions are affected by his tradeoff of the benefits of appearing honest against the benefits of misrepresentation. Because it is more costly for a manager to appear honest under stronger monetary incentives (since he has to forgo greater benefits of misreporting in order to achieve the same level of benefits associated with appearing honest), the prediction follows. More formally:

H4A. *The effect of peer honesty on the truthfulness of managerial report is lower when incentive compensation intensity is high.*

H4B. *The effect of audit team effectiveness on the truthfulness of managerial report is lower when incentive compensation intensity is high.*

Control Variables: Social Value Orientation (SVO) And Gender

Social value orientation (SVO)

Individuals tend to differ systematically in their personal preference for a particular distribution of payoffs to themselves and another party (Messick and McClintock 1968; Kuhlman and Marshello 1975; Liebrand, Wilke, Vogel, and Wolters 1986; McClintlock and Liebrand 1988; Van Lange et al. 1997; Fehr and Schmidt 1999; Fehr and Schmidt 2003; Handgraaf et al. 2004). This personal preference is defined as social value orientation (SVO) (see Appendix C for the measurement of SVO).

In the context of managerial reporting, I expect SVO to play a role since a manager's reporting decisions will directly influence both his and the firm's payoff. Prior researchers classify people as either pro-social or pro-self based on SVO scores

(Van Lange et al. 1997). Pro-selfs are more concerned about their own well-being and the consequences of exploitation than they are about the well-being of others (Derlega and Grzelak 1982; Camac 1992; Van Lange et al. 1997; Nauta, Dreu, and Vaart 2002). In contrast, pro-socials are concerned about the well-being of others. Based on these classifications, I explore whether pro-self managers are more likely to report untruthfully in order to maximize their own payoff, and whether pro-social managers are less likely to benefit themselves at the expense of the firm by reporting untruthfully.

Gender

A number of previous papers have found gender differences in lying (DePaulo, Epstein, and Wyer 1993), aggressive behavior (Hyde 1984; Eagly and Steffen 1986) and social behavior (Wood 1987; Eagly and Wood 1991). Furthermore, gender has been found to influence reporting behavior (Schwartz and Wallin 2002). Due to the above reasons, gender is included as a control variable.

2.3 Method and design

I conduct a computer-based experiment to examine the factors of interest. The experiment's design is adapted from several studies (Evans et al. 2001; Hannan, Kagel, and Moser 2002; Yu 2004). All subjects are assumed to be division managers of a firm. They need to make cost reports to their headquarters. The incentive scheme induces untruthful reporting because the participants' compensation is based on the profit of their divisions, which equals the division's output value minus reported costs. Managers can maximize their wealth by underreporting the cost figures. Participants are paid based on the results across 10 rounds of play (experiment euros are converted to real money).

2.3.1 Tasks

In each round, division managers are responsible for an investment project. At the beginning of each period, the headquarters proposes a contract, which specifies a manager's compensation. The costs of the project range from 500 experimental euros (EE) to 2500 EE. Information asymmetry is present because the headquarters of the firm only knows that the costs of this project range between 500 and 2500 EE, with equal probability for each value within the range. The division manager learns the true cost of the project at the beginning of each period. Both division managers and the headquarters observe the project's output value. The managers need to prepare a cost

report to submit to the headquarters. A manager's payoff equals the compensation rate (set by the headquarters) multiplied by the difference between output value and reported costs, that is, the manager's payoff = compensation rate * (output value - reported costs). The manager can maximize his payoff by reporting a lower cost than the true costs. The company's payoff is the project's payoff minus the manager's compensation, that is, a division's contribution to firm profit = the project's payoff – the manager's payoff. Managers face a tradeoff between lying to maximize private wealth and reporting honestly to maximize firm profit. The output value and true cost for each round are randomly chosen within a certain range by the experimenter.

2.3.2 Manipulations

I manipulate all three of the experimental factors. The intensity of incentive compensation is manipulated on a within-subject basis, and peer-group behavior and audit team effectiveness are manipulated on a between-subject basis. I elaborate on each of these manipulations in turn below.

Incentive compensation intensity (IncenCompInt): Each subject participates in 10 rounds of play. In each round, the manager's compensation rate is specified by the headquarters to be either 10% or 50% of the reported division's profit. The 10 rounds alternate between the two compensation contracts, with each subject playing five rounds with low incentive compensation and five rounds with high incentive compensation. Note that the rounds are balanced across sessions to control for order effects (i.e., either 10%-50% or 50%-10%).

Peer Honesty (PeerHonst): In each round, subjects are provided information about their peer managers' average reporting decision, where their peers are defined as a group of other managers of approximately the same status (i.e., that have similar position, investment projects, compensation, decision rights, and operating setting). In the setting with high peer honesty, participants receive a message that about 75% to 90% of their peer managers report a cost number that equals the true cost of the investment. In contrast, in the setting with low peer honesty, participants receive a message that around 10% to 25% of their peer managers report a cost number that equals the true cost of the investment.

Audit team effectiveness (AuditEfftv): In the experimental instructions, subjects learn that the headquarters will send an audit team to their division to investigate their reported costs. In real life, a firm determines the effectiveness of an audit team and the effectiveness could be influenced by having more financial experts on the audit team. In the experiment, the headquarters determine whether the firm has a financial expert serving on its audit team. Subjects are not informed about the effectiveness of the audit team. All participants are informed that the audit team has some incomplete knowledge about the true costs of the project and will form an opinion (favorable or unfavorable) about the manager's reported costs.

The audit team is modeled to detect untruthful reporting with a given probability. Subjects do not receive information about the probability of detection; they learn this probability in the process of play. In the case of an audit team with low effectiveness, the detection probability increases with the level of deviation from a truthful report at a level rate, that is, if managers deviate from a truthful report by no more than 10% (20%, 30%, 40%, 50%+), the corresponding probability of being detected is 10% (20%, 30%, 40%, 50%). In the case of an audit team with high effectiveness, the detection probability doubles compared to that of the audit team with low effectiveness. For example, if managers deviate by 1% to 10% from a truthful report, there is a 20% probability of being detected; if managers deviate by 10% to 20% from a truthful report, there is a 40% probability of being detected; and so on.

The audit team will then send a message to both the manager and the headquarters based on its findings. If its opinion is favorable, the subject receives the following message:

> "After reviewing your report, I find the costs you reported are fair. This finding has been reported to the headquarters.
>
> The Audit Team"

If the opinion is not favorable, the subject receives the following message:

> "Warning:
>
> After reviewing your report, I find the costs you reported are questionable. This finding has been reported to the headquarters.
>
> The Audit Team"

2.3.3 Participants and procedures

The experiment's 118 participants are undergraduate or master's degree students that are recruited from an accounting course of a business studies program of a west-European university. Upon entering the computer lab, the participants are randomly assigned to the between-subject factor conditions. Demographic data are reported in Table 1. On average, participants are 21.5 years old and have 21 months of (part-time) work experience. Twenty-four out of 118 participants have accounting-related work experience.

Table 1

Subject demographics (N=118)

		N=118	Percentage
Gender	Male	61	51.69
	Female	57	48.31
Age	<20 years	21	17.80
	20-25 years	92	77.96
	>25 years	5	4.24
Nationality	Dutch	70	59.32
	German	13	11.02
	Chinese	18	15.25
	Other	17	14.41
Work experience	0 month	24	20.34
	0-12 months	34	28.81
	12-24 months	28	23.73
	>24 months	32	27.12
Accounting experience	No	94	79.66
	Yes	24	20.34
Study level	First year BA	10	8.47
	Second year BA	1	0.85
	Third year BA	79	66.95
	Master level	24	20.34
	Other	4	3.39

Each subject is randomly assigned a confidential experimental ID when they enter the lab. This experimental ID is used for cash payment. Before they start the experimental task, subjects read the general instructions about the experiment. Then they provide some personal background information (age, gender, nationality, work experience, etc.). Subjects also take a pre-experiment questionnaire, which measures their social value orientation (SVO) scores.[9] Before they continue their tasks, a

[9] Our SVO measure is adopted from the psychology and economics literatures (see Van Lange, Otten, De Bruin and Joireman 1997). Specifically, social value orientations are measured by having subjects

hypothetical example is given to help the subjects understand the instructions better (see Appendix A). Subjects also solve seven true or false questions and two calculation questions based upon the experiment's instructions. They are not allowed to continue unless they answer all questions correctly. The instructor remains in the room to answer subjects' questions.

Subjects' cash payments are based on a participation fee of €3 and the total experimental euros (EEs) earned over all ten periods at the conversion ratio of 500 EEs to €1. Theoretically, each participant can earn €15 if they lie to the maximum extent possible and €9 if they report truthfully. The results show that the average payoff per participant is €10.35. After the experiment, subjects complete a questionnaire that examines the effectiveness of the manipulations and the subject's understanding of the experiment (see Appendix B for an overview of the exit questionnaire).

2.4 Results

2.4.1 Manipulation checks

In the exit questionnaire, I determine the effectiveness of the three manipulations by measuring subject responses (1 "completely disagree" to 7 "completely agree") to three statements (two in positive and one in negative phrasing). Average responses for all three treatments are significantly different from the neutral response of 4 ($p<0.001$). In particular, the subjects agree that their cost report behavior is influenced by (1) the incentive compensation rate (mean response 5.00, SD=1.71), (2) peer managers' reports (mean response 5.01, SD=1.62), and (3) the effectiveness of the auditing team (mean response 4.86, SD=1.44). The results indicate that all three of the manipulations are successful.

The exit questionnaire also contains five statements that examine the clarity of the instructions and the subjects' motivation. The mean response on these statements ranges from 5.21 to 6.02 and is significantly different from the neutral response of 4 ($p<0.001$). The subjects therefore understood the experiment and in general their motivation was high.

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divide a *hypothetical* amount of money between themselves and a *hypothetical* other. Based on their choices, subjects can be defined as: (1) a cooperative type, reflecting a preference for joint (collective) outcomes, (2) an individualistic type, reflecting a preference for own outcomes, (3) a competitive type, reflecting a preference for a large positive difference between own and other outcomes (McClintock, 1972). Researchers often categorize the individual type and the competitive type as pro-selfs and the corporative type as pro-social (Andreoni & Miller, 2002). See Appendix C for more details.

2.4.2 Summary statistics for dependent variable

I measure managerial honesty as a percentage ranging from 0 to 100%, where a higher ratio indicates more honest reporting.[10] A higher ratio indicates that participants forgo more compensation by reporting a figure closer to the true cost (and further from minimum-cost reporting, which would maximize their compensation).

Following Evans et al. (2001) I perform the analyses on adjusted data by replacing a small number of inconsistent reports (25 out of 1180 total reports) with the true cost.[11]

Table 2 gives summary statistics for the level of honest reporting under the three factor conditions.

The results from Table 2 show that managerial honesty is higher under 10% *IncenCompInt* (mean = 83.34) than under 50% *IncenCompInt* (mean = 79.23). Under both incentive contracts, subjects seem to conform to what their peers do, that is, they are more honest when their peers tend to report truthfully and less honest when their peers engage more in underreporting, although the influence of *PeerHonst* is larger under 10% *IncenCompInt* (78.92 vs. 88.08) than under 50% *IncenCompInt* (75.49 vs. 83.24). With regard to *AuditEfftv*, subjects seem to be more truthful with a *less* effective audit team. Thus, in contrast to *PeerHonst*, the influence of *AuditEfftv* is larger under 50% *IncenCompInt* (82.08 vs. 76.47) than under 10% *IncenCompInt* (84.42 vs. 82.30).

2.4.3 Tests of hypotheses

To facilitate comparison, the analyses are based on standardized values of the honest reporting metric (with a mean of zero and a standard deviation of one). Table 3 gives the full factorial ANCOVA analyses with *IncenCompInt* as a within-subject measure (10% vs. 50%) and *PeerHonst* and *AuditEfftv* as between-subject factors.

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[10] Managerial honesty is defined as $\pi = 1-(\sum_{i=1}^{n} Payoff\ \ claimed\ /\ \sum_{i=1}^{n} Payoff\ \ available)$, where *n* is the total number of rounds the subject plays in one setting; the "$\sum_{i=1}^{n}$ Payoff claimed" is the amount a subject actually earned across all the experiment's rounds by deviating from the true costs, and the "$\sum_{i=1}^{n}$ Payoff available" is the amount that a subject could have earned by lying to the maximum extent possible. In this setting, the formula is equivalent to 1-$\sum_{1}^{5}$(true costs-reported costs)/$\sum_{1}^{5}$(true costs-500), where 500 is the lowest value the manager can report.

[11] These reports are for costs higher than the true costs, which are inconsistent with subjects' trading off wealth and honesty because they would have received a higher payoff by reporting honestly. The analyses are also performed based on unadjusted data. The results do not change regarding the sign and the significance level of the coefficients.

Table 2

Summary statistics: Mean honest reporting* under three factor conditions

	IncenCompInt –Low			*IncenCompInt* –High		
	AuditEfftv			*AuditEfftv*		
	Low	High	**Total**	Low	High	**Total**
PeerHonst –Low	80.80	77.10	**78.92**	78.53	72.54	**75.49**
	N=30	N=31	N=61	N=30	N=31	N=61
PeerHonst –High	88.31	87.85	**88.08**	85.89	80.67	**83.24**
	N=28	N=29	N=57	N=28	N=29	N=57
Total	**84.42**	**82.30**	**83.34**	**82.08**	**76.47**	**79.23**
	N=58	N=60	N=118	N=58	N=60	N=118

**Honest Reporting*: 1-(true costs-reported costs)/(true costs-500).

IncenCompInt –Low: the condition whereby the manager's incentive compensation is 10% of the division's profit.

IncenCompInt –High: the condition whereby the manager's incentive compensation is 50% of the division's profit.

PeerHonst –Low: the condition whereby 10-25% of the peer managers' reports are honest.

PeerHonst –High: the condition whereby 75-90% of the peer managers' reports are honest.

AuditEfftv –High: the condition whereby high audit team effectiveness is two times as effective as that under low audit team effectiveness.

Covariates are gender and the participant's social value orientation (SVO). The test confirms that *IncenCompInt* is balanced (see manipulations for details), that is, there is no order effect ($p>0.60$).[12]

The results from Table 3 show that for within-subjects contrast analyses, the truthfulness of reports is significantly influenced by *IncenCompInt* ($p<0.05$). From the summary statistics, we know that subjects report more truthfully under the 10% *IncenCompInt* regime. The results support **H1,** suggesting that *IncenCompInt* has a negative effect on the truthfulness of reports. Results of between-subjects analyses suggest that *PeerHonst* significantly influences the truthfulness of reports ($p<0.05$), consistent with **H2**. In contrast, *AuditEfftv* is not found to be a significant factor influencing the truthfulness of reports, rejecting **H3**. Besides these main effects, the results also suggest the existence of an interactive effect between *IncenCompInt* and *PeerHonst* ($p<0.10$), consistent with **H4a,** suggesting that the effect of *PeerHonst* on the truthfulness of reports is lower when *IncenComplnt* is high. I find no evidence, however, supporting **H4b** on the interaction between *IncenCompInt* and *AuditEfftv*. Furthermore, the results reveal that SVO is a significant control variable when examining managerial reporting behavior ($p<0.05$), and that *IncenCompInt* interacts with Gender ($p<0.00$) to influence managerial honesty. To see more clearly the effects

[12] All p-values are from two-tailed tests.

Table 3

Full factorial analyses—GLM repeated measures

Dependent variable: honest reporting (standardized values)

Within-Subjects Contrasts	SS	F-stat.	Between-Subject Contrasts	SS	F-stat.
IncenCompInt	0.89	**5.66****	*PeerHonst*	6.94	**4.06****
*IncenCompInt * PeerHonst*	0.43	**2.73***	*AuditEfftv*	3.82	2.23
*IncenCompInt * AuditEfftv*	0.27	1.69	*PeerHonst * AuditEfftv*	0.17	0.10
*IncenCompInt * PeerHonst * AuditEfftv*	0.01	0.08	*Gender*	0.11	0.07
*IncenCompInt * Gender*	2.21	**14.05*****	*SVO*	11.06	**6.46****
*IncenCompInt * SVO*	0.12	0.75			

[a] Type III sum of squares are reported. All statistical inferences are based on two-tailed tests.

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

Honest reporting: 1- (true costs - reported costs)/(true costs - 500).

IncenCompInt: the condition whereby the manager's incentive compensation is either 10% or 50% of his division's profit.

PeerHonst: equals one if 75-90% of the peer managers' reports are honest, zero if 15-25% of the peer managers' reports are honest.

AuditEfftv: equals one if the audit team is highly effective, zero if it is less effective, where a highly effective audit team is two times as effective as a less effective audit team. For details, see the text for manipulations.

Gender: equals one if the subject is male, zero otherwise.

SVO: equals one if the subject is classified as pro-self, zero if the subject is classified as pro-social.

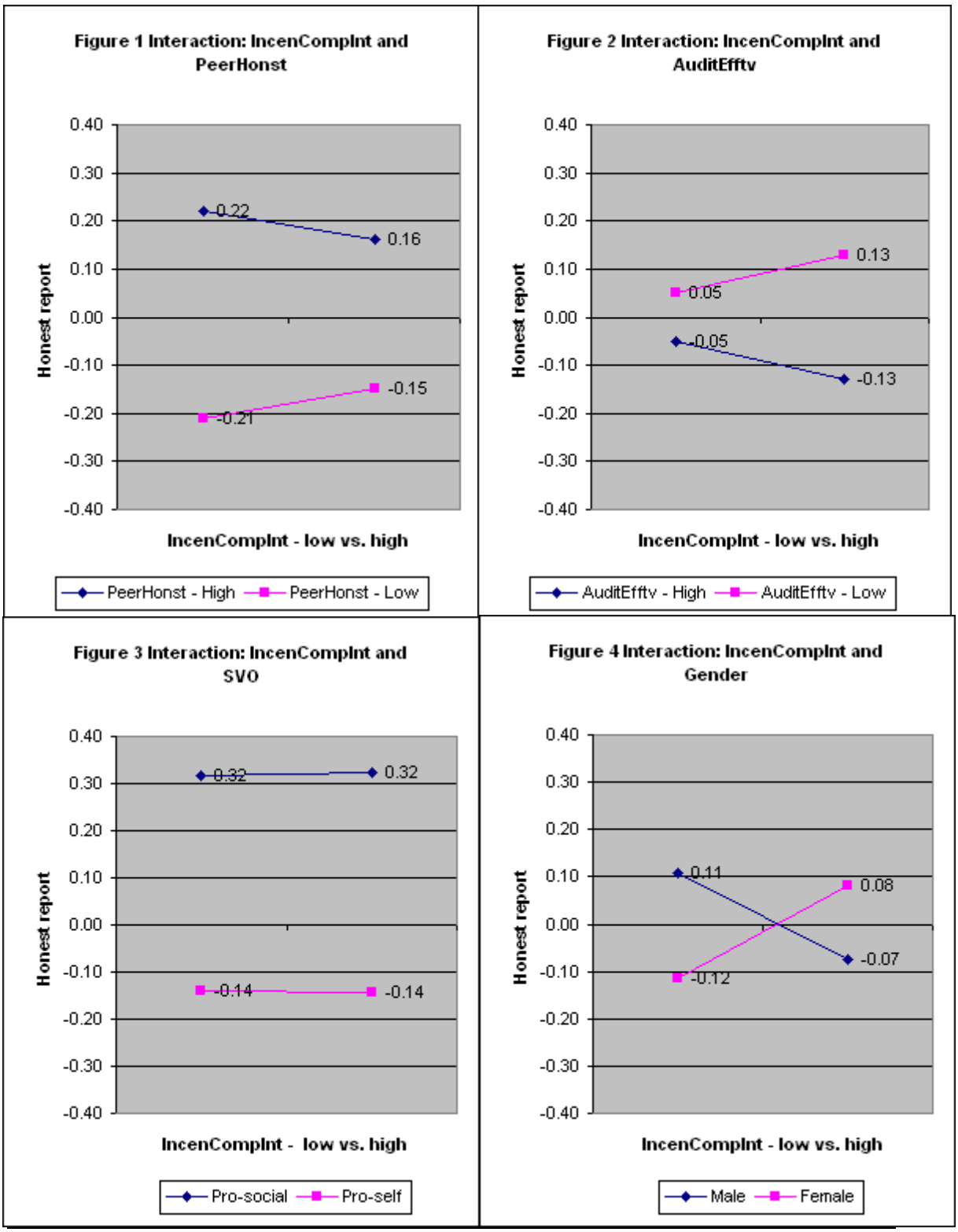
of these interactions, figures for selected interactive effects are presented in Panel A of Table 4. Panel B of Table 4 presents the ANCOVA results under two incentive contract types.

Figure 1 shows the interactive effect of *IncenCompInt* and *PeerHonst* on managerial reporting. *PeerHonst* is more effective under low *IncenCompInt* than under high *IncenCompInt*. Under low *IncenCompInt*, on average truthful managerial reporting is 0.22 above the mean when *PeerHonst* is high, while on average truthful managerial reporting is 0.21 below the mean when *PeerHonst* is low; under high *IncenCompInt*, on average truthful managerial reporting is 0.16 above the mean when *PeerHonst* is high, while on average truthful managerial reporting is 0.15 below the

mean when *PeerHonst* is low. Consistent with this result, Panel B shows that under low *IncenCompInt*, *PeerHonst* influences managerial reporting behavior significantly

Table 4

Panel A: Interactive effects on honest reporting (based on standardized values)



Panel B: Univariate analysis under different incentive contract type*

Dependent Variable: honest reporting with 10% *IncenCompInt*				
	SS [b]	df	F	Sig.
Corrected Model	12.74	5	2.74	**0.02**
PeerHonst	5.42	1	5.82	**0.02**
AuditEfftv	1.03	1	1.11	0.29
*PeerHonst * AuditEfftv*	0.14	1	0.15	0.70
Gender	1.66	1	1.78	0.19
SVO	4.45	1	4.78	**0.03**
Dependent Variable: honest reporting with 50% *IncenCompInt*				
	SS	df	F	Sig.
Corrected Model	11.82	5	3.13	**0.03**
PeerHonst	1.96	1	2.09	0.15
AuditEfftv	3.05	1	3.24	**0.07**
*PeerHonst * AuditEfftv*	0.04	1	0.05	0.83
Gender	0.67	1	0.71	0.40
SVO	6.73	1	7.17	**0.01**

[a] All intercepts are significant but not reported.

[b] Type III sum of squares.

Honest reporting: 1- (true costs - reported costs)/(true costs - 500).

IncenCompInt: the condition whereby the manager's incentive compensation is either 10% or 50% of his division's profit.

PeerHonst: equals one if 75-90% of the peer managers' reports are honest, zero if 15-25% of the peer managers' reports are honest.

AuditEfftv: equals one if the audit team is highly effective, zero if it is less effective, where the highly effective audit team is two times as effective as the less effective audit team. For details, see the text for manipulations.

Gender: equals one if the subject is male, zero otherwise.

SVO: equals one if the subject is classified as pro-self, zero if the subject is classified as pro-social.

at $p<0.05$; under high *IncenCompInt*, *PeerHonst* no longer shows significant influence.

Figure 2 shows the interactive effect between *IncenCompInt* and *AuditEfftv*. The effect of *AuditEfftv* on the truthfulness of reporting is not significant in the regression analysis. The interactive effect between *IncenCompInt* and *AuditEfftv* is also negligible but it seems that *AuditEfftv* has a larger effect under high *IncenCompInt*: honest reporting is 0.05 above (below) the mean when *AuditEfftv* is low (high) under low *IncenCompInt*, whereas under high *IncenCompInt*, honest reporting is 0.13 above (below) the mean when *AuditEfftv* is low (high). Univariate analyses from Panel B show that *AuditEfftv*'s influence is negligible under low *IncenCompInt* and marginally significant at $p<0.10$ under high *IncenCompInt*.

Figure 3 shows the interactive effect of *IncenCompInt* and SVO. Consistent with theory, SVO is constant across the two levels of *IncenCompInt*. However, when

subjects are classified as pro-socials, the truthfulness of their reports is 0.32 higher than the mean; whereas when subjects are classified as pro-selves, the truthfulness of their reports is 0.14 lower than the mean. Panel B further suggests that, as a personal trait measure, SVO is significant in both regressions.

Figure 4 presents the interactive effects between *IncenCompInt* and Gender. The figure reveals that there is a significant difference in reporting behavior between male and female subjects regarding the influence of *IncenCompInt*. When *IncenCompInt* is switched from low to high, male subjects report dramatically less honestly, moving from 0.11 above the mean to 0.07 below the mean, but female subjects report considerably more honestly, moving from 0.12 below the mean to 0.08 above the mean. Although the ANCOVA analysis of Panel B shows that Gender has no significant effect under either high or low *IncenCompInt*, there is a directional change from less to more honest reporting of female subjects and from more to less honest reporting of male subjects when *IncenCompInt* is switched from low to high.

2.4.4 Sensitivity analyses

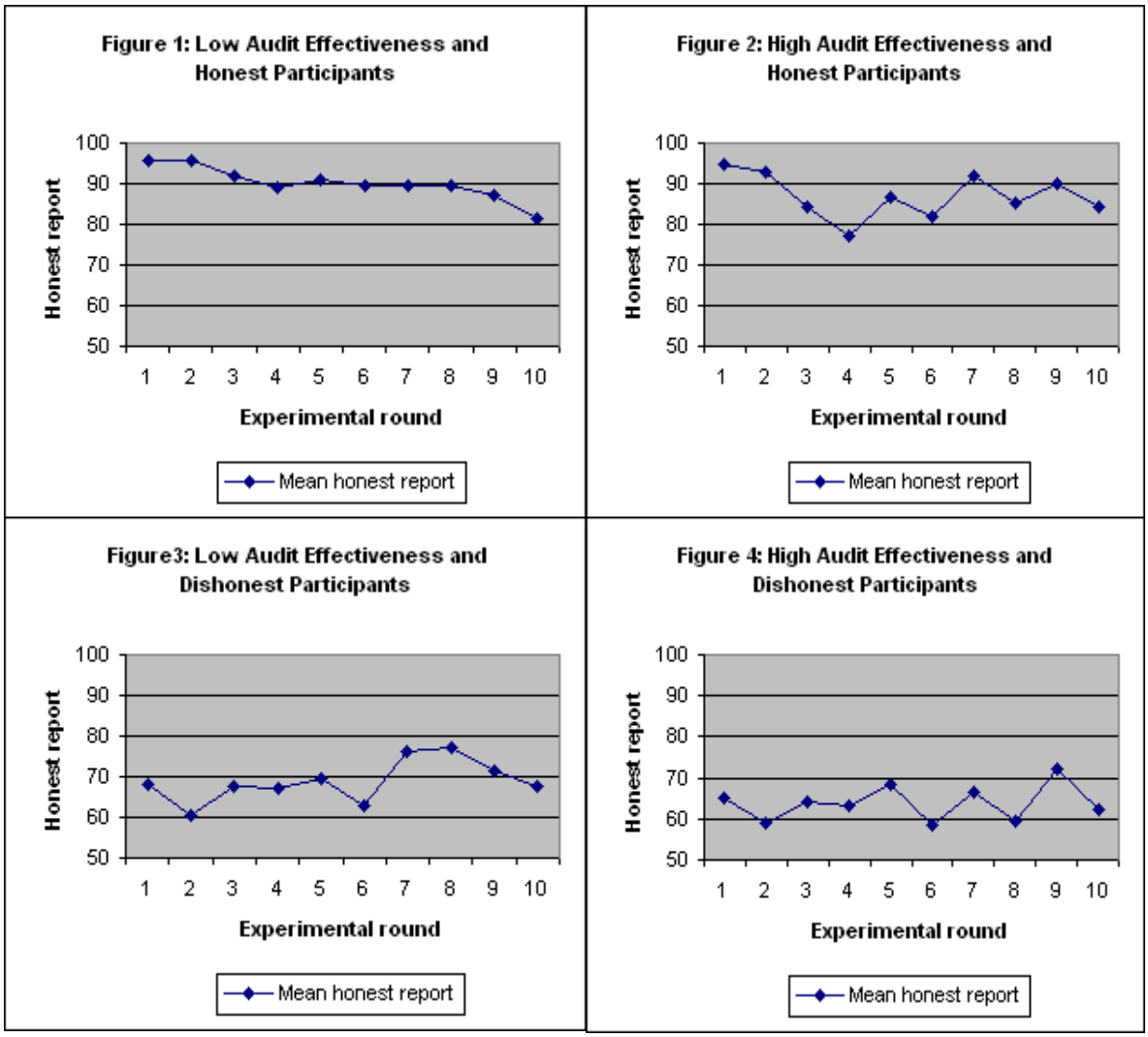
In this sub-section I first perform additional analyses on the effect of *AuditEfftv;* I then perform sensitivity analyses to verify the robustness of the main tests' other results.

The effect of AuditEfftv on sub-samples: The effect of *AuditEfftv* on managerial honesty is negligible in all tests. This result is not consistent with my hypothesis, nor is it consistent with the results of the manipulation checks that indicate, on average, participants agree that audit team effectiveness influences their reporting decisions. To explore this inconsistency, I divide the participants into two groups according to their honesty level and perform the analysis separately on the sub-samples. In particular, participants are divided into two sub-samples according to whether they made an honest report above or below the mean in the first or the second round. Participants who make an honest report above the mean are defined as honest participants and those who make an honest report below the mean are defined as dishonest participants. Figures for the analysis are presented in Table 5.

Figure 1 shows the reporting behavior of honest participants in the low audit effectiveness setting. The participants show a downward trend in making honest reports until the last round. Figure 2 shows that, in high audit effectiveness setting, the honest participants show a downward trend in making honest reports through the forth

Table 5

The effect of audit effectiveness on sub-samples



round, and then show an increasing trend in honest reports through the last round. This pattern is consistent with these participants feeling embarrassed after getting caught and then becoming very cautious about their reporting behavior. The different behavioral patterns of the honest participants in these two audit effectiveness settings are driven by the difference in detection probabilities. From Figure 3 and Figure 4, we can see that the dishonest participants show a relatively flat trend regarding their reporting figures in both high and low audit effectiveness settings. It therefore seems that audit effectiveness works only partly for some participants. On average it does not display any significant effects.

Alternative measure for managerial honesty: The analysis is repeated based on a frequency measure defined as the number of rounds in which the subject revealed the

true cost out of the total number of experimental rounds for each treatment (five rounds each for the two level of *IncenCompInt*). The full factorial ANCOVA repeated measure results are the same as those reported in Tables 3 and 4, although the interaction between *IncenCompInt* and *PeerHonst* becomes somewhat weaker.

Results based on sub-sample without outliers: Three out of 118 participants lied to the maximum extent possible in all experimental rounds. All of these subjects correspond to the high *AuditEfftv* condition. I therefore perform detection tests to determine whether these three observations can be labeled as outliers;[13] the results indicate that, indeed, these observations are outliers. I then re-perform the analyses based on the sample without these outliers (results not tabulated). The results from the full factorial ANCOVA analysis remain materially the same in terms of both coefficient magnitude and significance level. The results from the univariate analysis also remain the same.

Additional control variables: I repeat the tests adding work experience and accounting experience as extra control variables. The results remain the same and both work experience and accounting experience show positive effects on managerial honesty, which may indicate that subjects with (accounting) work experience are more cautious when making financial reports.

Results based on four rounds of data: Data from the final experimental round may not be reliable since previous experiments show that there is "end-round" effect (subjects behave quite differently in the last experimental round) (Hannan et al. 2006). The results based on four rounds of data are largely consistent with the results from the analysis of five rounds of data (results not tabulated).

Validity of the honesty measure: it is maybe a concern that the honesty measure could be measuring how well these participants understand the experiment. If it is true, we will be induced to believe that some fraction of the subjects sees through the

[13] A test heuristic suggests that an observation with a z-score greater than three should be labeled as an outlier. In a more reliable test, a modified z-score test is determined based on outlier-resistant estimators. The median absolute deviation about the median (MAD) is such an estimator. The test heuristic indicates that an observation with a modified z-score greater than three and a half should be labeled as an outlier.

experiment and lie to the maximum; those who do not understand the experiment are honest, but had they understood what was going on, would have lied to the maximum as well. To rule out these possibilities, I perform the following tests: 1) I run an association test between the honesty measure and several self-reported scores on how well the participants understand the experiment; 2) I run an association test between the honesty measure and the time the participants used to solve the quiz about the experiment before they run the formal experiment. I collect data on how well the participants understand the experiment with three questions (see question 1, 4, and 6 in Appendix B for details). I run association tests between the honesty measure and scores for each of these three questions as well as the average score of these questions. The results show that there is no significant relationship between the honesty measure and scores of how well they understand the experiment (p values range from 0.19 to 0.97). The results also show that there is no significant relationship between the honesty measure and the time the participants spent on solving the quiz regarding the experiment (p value equals 0.85). In sum, the results show that the honesty level of these participants is not related with their understanding of the experiment.

Overall, the sensitivity checks show that the evidence relating to **H1**, **H2,** and **H4A** is quite robust. Furthermore, SVO and gender continue to be significant control variables for reporting behavior. *AuditEfftv,* in contrast, generally does not affect reporting behavior, although there is some evidence that it might help promote honesty among individuals who dislike being found out after underreporting.

2.5 Discussion and conclusion

This paper provides experimental evidence on how incentive compensation, peer-group behavior, and audit effectiveness influence managerial reporting behavior. The results show first that high incentive compensation intensity induces subjects to report less truthfully, consistent with Bergstresser and Philippon's (2006) findings that highly "incentivized" CEOs tend to manipulate reported earnings more. Next, high peer honesty is found to promote truthful managerial reporting, which suggests that peer honesty is potentially a valuable tool to promote more truthful reporting. However, the magnitude of honest reporting is influenced more significantly by peer behavior when incentive compensation intensity is low, that is, under incentive-intensive contracts, the cost of making truthful reports increases and thus managers are less likely to follow their peers. This finding provides the first clear evidence that

managers trade off behavioral (non-monetary) and economic factors in making their reporting decisions, and is consistent with Brickley, Smith and Zimmerman (1997), who argue that the level of honesty declines as the payoff to lying increases. Finally, the results show no conclusive evidence regarding the effect of audit effectiveness on managerial reporting behavior.

Turning attention to our controls, the tests indicate that one's social value orientation (SVO) and gender are both important control variables in the context of managerial reporting behavior. Pro-self managers, as classified according to SVO scores, always report less truthfully compared with pro-social managers. An interesting interaction between incentive compensation and gender shows that female managers report more truthfully under high incentive compensation intensity compared with low incentive compensation intensity, while their male peers do the opposite. Previous research has revealed some evidence that women are more likely than men to be pro-social, but the evidence is not consistent (for a review, see Van Lange, Liebrand, Messick, and Wilke 1992; Komorita and Parks 1994). In this paper, the correlation between SVO and gender is -0.13, but not statistically significant ($p=0.18$), which shows there is no relation between SVO and gender. The interaction effect between incentive compensation intensity and gender is consistent with previous research that many people do not behave in a self-interest maximizing manner due to their perception of fairness (see, e.g., Guth, Schmittberger, and Schmittberger 1982; Camerer and Thaler 1995; Kagel and Roth 1995) and women are more sensitive to social context than are men (Croson and Gneezy 2004) . In this experiment, women may perceive 50% incentive scheme as fair and consider honest behavior as more appropriate. Men care more about the cost of being honest; they are less honest under 50% incentive scheme because it is more costly to be honest given that the pay-off for lying is higher.

The results above suggest a need to carefully consider the effect of incentive compensation, peer behavior, and the role of auditing when designing contracts. Incentive compensation, while it has been shown to be effective in aligning interests of managers and firms, also appears to have dark side. With respect to peer behavior, peers can have a positive effect if they behave in a desired direction or a negative effect if they behave in an undesired direction. This result highlights the possibility of using peer groups as an alternative mechanism to promote honesty in managerial reporting. Turning to audit effectiveness, the results suggest that absent a penalty

upon the detection misreporting, audit effectiveness does little to promoting truthful reporting.

By integrating the insights from both economics and the behavioral sciences into accounting theories, this paper adds to our knowledge on how managers balance their monetary and non-monetary considerations when deciding on the honesty of their reports. However, much is still unknown about the influence of peer behavior. One important avenue for future research is to explore this issue further. For example, do managers react differently to peers' influence when there is a penalty attached with formal governance?

2.6 References

Andreoni, J., and J. Miller. 2002. Giving according to GARP: An Experimental Test of the Consistency of Preferences for Altruism. *Econometrica* 70:737-753.

Baiman, S. 1990. Agency Research in Managerial Accounting: A Second Look. *Accounting, Organizations and Society* 15 (4):341-371.

Baiman, S., and J. H. Evans, III. 1983. Pre-Decision Information and Participative Management Control Systems. *Journal of Accounting Research* 21 (2):371-395.

Baiman, S., J. H. Evans, III, and N. J. Nagarajan. 1991. Collusion in Auditing. *Journal of Accounting Research* 29 (1):1-18.

Baiman, S., and K. Sivaramakrishnan. 1991. The Value of Private Pre-Decision Information in a Principal-Agent Context. *The Accounting Review* 66 (4):747-766.

Barron, J. M., and K. P. Gjerde. 1997. Peer Pressure in an Agency Relationship. *Journal of Labor Economics* 15 (2):234-254.

Bergstresser, D., and T. Philippon. 2006. CEO Incentives and Earnings Management. *Journal of Financial Economics* 80 (3):511-529.

Bernheim, B. D. 1994. A Theory of Conformity. *Journal of Political Economy* 102 (5):841-877.

Bowen, R. M., S. Rajgopal, and M. Venkatachalam. 2005. Accounting Discretion, Corporate Governance and Firm Performance. Working paper, University of Washington.

Boyle, E. J. 1993. Two Decades of Rediscovery: The Benefits of Internal Auditing. *Internal Auditing* 8 (4):3-9.

Brickley, J. A., C. W. Smith, and J. L. Zimmerman. 1997. *Managerial Economics and Organizational Architecture*. Boston, Mass [etc.]: Irwin McGraw-Hill.

Bruner, D., M. McKee, and R. Santore. 2005. Equity-Based Compensation and Managerial Fraud: An Experimental Investigation. Working paper, University of Calgary.

Camac, C. 1992. *Information Preferences in a Two-Person Social Dilemma*: Elmsford, NY, US: Pergamon Press.

Camerer, C., and R. H. Thaler. 1995. Anomalies Ultimatums, Dictators and Manners. *The Journal Of Economic Perspectives* 9 (2):209.

Carcello, J. V., C. W. Hollingsworth, A. Klein, and T. L. Neal. 2006. Audit Committee Financial Expertise, Competing Corporate Governance Mechanisms, and Earnings Management. Working paper, University of Tennessee.

Chow, C. W., J. C. Cooper, and W. S. Waller. 1988. Participative Budgeting: Effects of a Truth-Inducing Pay Scheme and Information Asymmetry on Slack and Performance. *The Accounting Review* 63 (1):111-122.

Chtourou, S. M., J. Bedard, and L. Courteau. 2001. Corporate Governance and Earnings Management. Working paper, University of Sfax, Tunisia.

Croson, R., and U. Gneezy. 2004. Gender Differences in Preferences. Working paper, Wharton School, University of Pennsylvania.

Denis, D. J., P. Hanouna, and A. Sarin. 2006. Is there a Dark Side to Incentive Compensation? Working paper, Purdue University.

DePaulo, B. M., J. A. Epstein, and M. M. Wyer. 1993. *Sex differences in lying: How women and men deal with the dilemma of deceit.* Edited by M. Lewis and C. Saarni. New York: Guilford Press.

Derlega, V. J., and J. Grzelak. 1982. *Cooperation and Helping Behavior: Theories and Research*. New York [etc.]: Academic Press.

Eagly, A., and V. J. Steffen. 1986. Gender and Aggressive Behavior: A Meta-Analytic Review of the Social Psychology Literature. *Psychological Bulletin* 100:309-330.

Eagly, A., and W. Wood. 1991. Explaining Sex Differences in Social Behavior: A Meta-Analytic Perspective. *Personality and Social Psychology Bulletin* 17:306-315.

Erickson, M., M. Hanlon, and E. L. Maydew. 2006. Is There a Link between Executive Equity Incentives and Accounting Fraud? *Journal of Accounting Research* 44 (1):113-143.

Evans, J. H. I., R. L. Hannan, R. Krishnan, and D. V. Moser. 2001. Honesty in Managerial Reporting. *The Accounting Review* 76 (4):537-559.

Fehr, E., and K. M. Schmidt. 1999. A Theory of Fairness, Competition, and Cooperation. *The Quarterly Journal of Economics* 114 (3):817-868.

———. 2003. Theories of Fairness and Reciprocity- Evidence and Economic Applications. In *Advances in Economics and Econometrics, Econometric Society Monographs, Eighth World Congress*, edited by M. Dewatripont, L. P. Hansen and S. J. Turnovsky, 208-257.

Guth, W., R. Schmittberger, and R. Schmittberger. 1982. An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior and Organization* 3 (4):367.

Handgraaf, M. J. J., E. v. Dijk, H. A. M. Wilke, and R. C. Vermunt. 2004. Evaluability of Outcomes in Ultimatum Bargaining. *Organizational Behavior and Human Decision Processes* 95 (1):97-106.

Hannan, R., F. Rankin, and K. Towry. 2006. The Effect of Information Systems on Honesty in Managerial Reporting: A Behavioral Perspective. *Contemporary Accounting Research* 23 (4):885-932.

Hannan, R. L. 2005. The Combined Effect of Wages and Firm Profit on Employee Effort. *The Accounting Review* 80 (1):167-188.

Hannan, R. L., J. H. Kagel, and D. V. Moser. 2002. Partial Gift Exchange in an Experimental Labor Market: Impact of Subject Population Differences, Productivity Differences, and Effort Requests on Behavior. *Journal of Labor Economics* 20 (4):923-951.

Huddart, S. J., and P. E. Fischer. 2008. Optimal Contracting with Endogenous Social Norms. *American Economic Review, Forthcoming*.

Hyde, J. S. 1984. How Large are Gender Differences in Aggression? A Developmental Meta-Analysis. *Developmental Psychology* 20:722-736.

Jackson, B. R., and V. C. Milliron. 1989. Tax Preparers: Government Agents or Client Advocates? *Journal of Accountancy* 167 (5):76-82.

Kachelmeier, S. J., and M. Shehata. 1997. Internal Auditing and Voluntary Cooperation in Firms: A Cross-Cultural Experiment. *The Accounting Review* 72 (3):407-431.

Kagel, J. H., and A. E. Roth. 1995. *The handbook of experimental economics*: Princeton, N.J.: Princeton University Press.

Klein, A. 2002. Audit Committee, Board of Director Characteristics, and Earnings Management. *Journal of Accounting & Economics* 33 (3):375-400.

Koford, K., and M. Penno. 1992. Accounting, Principal-Agent Theory, and Self-Interested Behavior. In *Ethics and agency theory: An introduction. Ruffin Series in Business Ethics.*, edited by N. E. F. Bowie, R. Edward: New York; Oxford; Toronto and Melbourne: Oxford University Press, 127-42.

Kohlberg, L. 1984. *Essays on Moral Development*. Vol. Two: San Francisco: Harper & Row.

Komorita, S. S., and C. D. Parks. 1994. *Social dilemmas*. Madison, WI [etc.]: Brown & Benchmark.

Kuhlman, D. M., and A. Marshello. 1975. Individual Differences in the Game Motives of Own, Relative, and Joint Gain. *Journal of Research in Personality* 9 (3):240-251.

Liebrand, W. B. G., H. A. M. Wilke, R. Vogel, and F. J. M. Wolters. 1986. Value Orientation and Conformity: A Study Using Three Types of Social Dilemma Games. *The Journal of Conflict Resolution* 30 (1):77-97.

Luft, J. L. 1997. Fairness, Ethics and the Effect of Management Accounting on Transaction Costs. *Journal of Management Accounting Research* 9:199-216.

McClintlock, C. G., and W. B. G. Liebrand. 1988. Role of Interdependence Structure, Individual Value Orientation, and Another's Strategy in Social Decision Making: A Transformational Analysis. *Journal of Personality and Social Psychology* 55 (3):396-409.

McClintock, C. G. 1972. Social Motivation - a Set of Propositions. *Behavioral Science* 17:438-454.

Messick, D.-M., and C.-G. McClintock. 1968. Motivational Bases of Choice in Experimental Games. *Journal of Experimental Social Psychology* 4 (1):1-25.

Nauta, A., C. K. W. D. Dreu, and T. V. D. Vaart. 2002. Social Value Orientation, Organizational Goal Concerns and Interdepartmental Problem-Solving Behavior. *Journal of Organizational Behavior* 23 (2):199-213.

Peasnell, K. V., P. F. Pope, and S. Young. 2000. Board Monitoring and Earnings Management: Do Outside Directors Influence Abnormal Accruals? Working paper, Lancaster University.

Penno, M. 1990. Accounting Systems, Participation in Budgeting, and Performance Evaluation. *The Accounting Review* 65 (2):303-314.

Rotter, J. B. 1966. Generalized Expectancies for Internal Versus External Control of Reinforcement. *Psychological Monographs: General and Applied* (80):1-28.

Schwartz, S. T., and D. E. Wallin. 2002. Behavioral Implications of Information Systems on Disclosure Fraud. *Behavioral Research in Accounting* 14:197-221.

Slemrod, J. 2004. The Economics of Corporate Tax Selfishness. *National Tax Journal* 57 (4):877-899.

Sprinkle, G. B. 2003. Perspectives on Experimental Research in Managerial Accounting. *Accounting, Organizations and Society* 28 (2-3):287-318.

Stevens, D. E. 2002. The Effects of Reputation and Ethics on Budgetary Slack. *Journal of Management Accounting Research* 14:153-171.

Stevens, D. E., and A. Thevaranjan. 2003. Ethics and Agency Theory: Incorporating a Standard for Effort and an Ethically Sensitive Agent. Working paper, Syracuse University.

———. 2005. Is there Room Within Principal-Agent Theory for Ethics? Working paper, Florida State University.

Trivedi, V. U., M. Shehata, and B. Lynn. 2003. Impact of Personal and Situational Factors on Taxpayer Compliance: An Experimental Analysis. *Journal of Business Ethics* 47 (3):175-197.

Van Lange, P.-A. M., W.-B. G. Liebrand, D.-M. Messick, and H.-A. M. Wilke. 1992. Introduction and literature review.

Van Lange, P. A. M., W. Otten, E. M. N. De Bruin, and J. A. Joireman. 1997. Development of Prosocial, Individualistic, and Competitive Orientations: Theory and Preliminary Evidence. *Journal of Personality and Social Psychology* 73 (4):733-746.

Wood, W. 1987. Meta-Analytic Review of Sex Differences in Group Performance. *Psychological Bulletin* 102:53-71.

Xie, B., I. Davidson, Wallace N., and P. J. DaDalt. 2003. Earnings Management and Corporate Governance: The Role of the Board and the Audit Committee. *Journal of Corporate Finance* 9 (3):295-316.

Young, S. M. 1985. Participative Budgeting: The Effects of Risk Aversion and Asymmetric Information on Budgetary Slack. *Journal of Accounting Research* 23 (2):829-842.

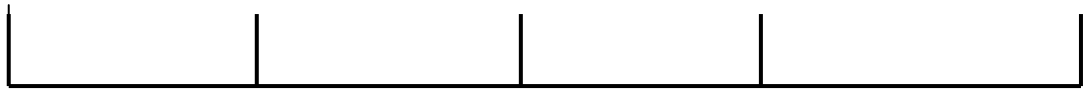
Yu, H. 2004. The Effects of Incentive Contracts and Monitoring Mechanism on Honesty in Managerial Reporting. Working paper, National Chengchi University.

Zey-Ferrell, M., K. M. Weaver, and O. C. Ferrell. 1979. Predicting Unethical Behavior Among Marketing Practitioners. *Human Relations* 32 (7):557-569.

2.7 Appendix A. Overview of an experimental period

At the beginning of each period, the headquarters of the corporation proposes a contract about your compensation. You have the following investment project: **the costs of this project range from 500 to 2500. This is the only information the headquarters knows.** As a manager, you know the exact costs of the project. Both you and the headquarters observe the output value of the project. After completing the project, you need to report the costs of the project to the headquarters. Then both your payoff and your division's contribution to firm profit can be calculated.

The following timeline demonstrates your action sequence in this experiment:



The headquarters proposes your compensation contract	The project is completed	The output value is known	You decide which costs to report	You are paid according to the compensation contract

Hypothetical Example (Please read the following example very carefully):

Please note that ***this example is only a description of possible actions in an experimental period and should not be construed to be the "best" set of actions possible***.

[Action 1]

At the beginning of each period, headquarters propose a contract about your compensation. Suppose the contract is the following:

Your payoff = Compensation rate *(output value - reported costs)

Suppose the compensation rate is 10%.

The division's contribution to firm profit is that the project's payoff subtracts your payoff. That is:

Your division's contribution to firm profit = Project's payoff -Your payoff

[Action 2]

The project is completed.

[Action 3]

Both you and the headquarters know the output value. Only you know the real costs. Suppose the output value is 3000 EEs.

[Action 4]

You decide which costs to report. Suppose you know that the exact costs are 2000 EEs. The headquarters only knows that the costs could range in any value between 500 EEs and 2500 EEs with equal probability. **Following shows the effects of your report decision on your payoff and your division's contribution to firm's profit.**

If you report that the costs are 2500 EEs,

Your payoff = 10% * (3000-2500) = 50 EEs

Division's contribution to firm = 1000-50 =950 EEs

If you report that the costs are 2000 EEs,

Your payoff = 10% * (3000-2000) = 100 EEs

Division's contribution to firm= 1000-100 =900 EEs

If you report that the costs are 1500 EEs,

Your payoff = 10% * (3000-1500) = 150 EEs

Division's contribution to firm= 1000-150 = 850 EEs

To summarize, both your payoff and your division's contribution to firm profit will be influenced by your reported costs. If you reported lower costs than real, your division's contribution to the firm will be lower.

[Action 5]

Based on your reported cost, you will be paid according to your compensation contract.

[Peer Group]

In a very similar setting, some managers performed the same tasks as you do here, e.g., they had the same projects as you; they knew the exact costs, but headquarters didn't; they also submit the cost report to the headquarters.

In each experimental period, you will be provided information about the average reporting decision.

[Audit Team]

Since the headquarters don't know the exact costs, in each experimental period an audit team will be sent to your division to investigate your reported costs. The headquarters will also determine whether the firm:

- has at least one financial expert serving on its audit team; or

- does not have a financial expert serving on its audit team.

The audit team has some knowledge about the true costs of the project. It will give an opinion about your reported costs. **Then the audit team will send a message* to you and the headquarters based on its findings.**

***If its opinion is favorable, you will receive the following message:**
"After reviewing your report, we find the cost you reported is fair. This finding has been reported to the headquarters.

The Audit Team"

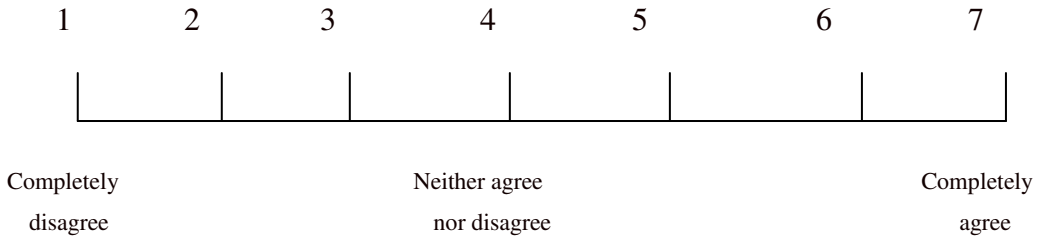
If its opinion is not favorable, you will receive the following message:
Warning:
After reviewing your report, we find the cost you reported is questionable. This finding has been reported to the headquarters.

The Audit Team"

2.8 Appendix B. Exit questionnaire

You will receive 20 questions in relation to the experiment.

Each question has a 1 to 7 answering scale. Fill in the number that applies best to you.



1. The instructions were clearly formulated.
2. I was motivated to perform well in the different parts of the experiment.
3. I felt stressed with respect to time.
4. I understood what I had to do in the experiment.
5. I thought the tasks were fun.
6. I clearly knew the consequence of my choice.
7. When I prepared my own cost report, I considered what other managers reported.
8. I felt pressure when the audit team said my report was questionable.
9. When I made my reporting decision, the compensation rate was an important factor to consider.
10. Other managers' decisions influenced my decision.
11. The compensation rate affected my cost reporting choice.
12. The audit team influenced my reporting decision.
13. I didn't care about the compensation rate when I made my cost reporting decisions.
14. I didn't care what the audit team said.
15. I didn't care what the other mangers reported.
16. Reporting lower than real costs would be unfair to the firm.
17. I felt guilty when I reported a lower cost than real.
18. I didn't care how much the headquarters received.
19. I didn't feel ashamed when I deviated from the true cost.
20. I felt guilty when I was caught by the audit team.

2.9 Appendix C. Measure of social value orientation

In this short questionnaire we ask you to make a number of choices. You make choices by means of circling letters A, B, or C. Your choices determine the number of points that you and somebody else receive. Assume that *this other person also makes choices* in exactly the same task.

Who is this other person?
Assume that the other person is somebody that you do not know (have never met) and that you will never meet this person in the future. The other person is completely unknown to you.

What do points mean?
Points represent the things you value. Assume that every point is valuable to you. The more points you get the better for you. The same is true for the other person: the more points he or she gets, the better for him or her.

An example:

	A	B	C
You get	500	500	550
Other person gets	100	500	300

This example works as follows. If you choose A, you will get 500 points, and the other person will get 100 points; if you choose B you will get 500 points and the other person will get 500 points; if you choose C you will get 550 points and the other person gets 300 points.

After this introduction, nine tables closely resembling the one in the example are presented to the participants. Each table has three allocations, cooperative, individualist, and competitive, always in this order. Participants choose one of the following three matrix values according to his/her preference. Finally, his/her score will be calculated and he/she classified into pro-social (cooperative) or pro-self (individualist and competitive) types based on the scores.

	A	B	C
	[You, Other]	[You, Other]	[You, Other]
1	[480, 480]	[540, 280]	[480, 80]
2	[500, 500]	[560, 300]	[500, 100]
3	[520, 520]	[580, 320]	[520, 120]
4	[490, 490]	[560, 300]	[500, 100]
5	[500, 500]	[560, 300]	[490, 90]
6	[500, 500]	[570, 300]	[500, 100]
7	[510, 510]	[560, 300]	[510, 110]
8	[500, 500]	[550, 300]	[500, 100]
9	[490, 490]	[540, 300]	[480, 100]

Chapter 3: Top Level Executive Characteristics and Earnings Attributes[*†]

3.1 Introduction

We explore the earnings properties of firms that have backdated stock options granted to executives in an effort to determine to what extent accounting earnings are shaped by personal traits of the top level managers of the firm. Our investigation is motivated by an increasing awareness in the extant literature that substantial variation in firm reporting practices remains after controlling for fundamental factors that work at the industry or the firm level (Bowen, Rajgopal, and Venkatachalam 2008; Francis, Huang, Rajgopal, and Zhang 2008). Managerial characteristics are a probable source of this heterogeneity among firms (Bertrand and Schoar 2003). Research on the reporting effects of these characteristics has been stymied by the absence of reliable proxies that can be implemented in large sample studies. We propose that the context of the option backdating scandal provides a powerful setting that allows us to dichotomize the population of senior executives into those who have been identified as willing to engage in (likely) illegal activities and into those who have not. A priori, a manager's willingness to commit fraudulent acts should reveal personality traits that also affect the way in which managers exercise their discretion over financial reporting. Thus, in a way we circumvent the problem of measuring executive characteristics by examining a setting in which we can identify those executives whose (ethical) propensities have put them into the extreme tail of the distribution of a very specific personality trait, which we shorthand as "honesty".

Employee stock options (ESO) are usually granted "at-the-money", i.e., the exercise price of the option is set equal to the market price of the underlying stock on the grant date. As the option value is higher when the exercise price is lower, managers prefer to be granted options when the stock price is at its lowest. Prior to the Sarbanes-Oxley Act of 2002, firms were not required to report the dates of the option grant until 45 days after the fiscal year end. This gave managers the opportunity to

[*] Based on a paper co-authored with Peter D. Easton (University of Notre Dame) and Laurence van Lent (Tilburg University).

[†]Yuping Jia's research is supported by a grant (no. 017.001.101) from the Netherlands Organization for Scientific Research (NWO). We received helpful feedback from workshop participants at Tilburg University and Frankfurt University.

"choose" a past date when the market price was particularly low; in short, managers were able to "backdate" the ESO.[16] New SEC regulation announced in 2002 requires firms to report options grants within two business days, which reduces the possibility to backdate, but does not eliminate it altogether.[17]

After *The Wall Street Journal* picked up on a study by Eric Lie (2005), option backdating has continued to feature on the front pages, implicating a widening group of companies of involvement in the scandal.[18] At the same time, the Securities and Exchange Commission as well as state and federal prosecutors have launched investigations into possible improper backdating of options and over 130 listed firms were incriminated by the summer of 2007. Consequently, more than 50 top executives and directors of named companies resigned or were fired. Backdating has also attracted significant attention from the academic community and substantial work has been done to investigate its economic consequences.[19] We only indirectly add to this area as our interest is not in option backdating itself, but instead in the impact of top executive personality traits on the properties of accounting information reported by the firm.

Our main prediction is that—compared with non-backdating executives—those managers who have revealed their type by engaging in option backdating, are also more likely to use their discretion over reported accounting information in such way that its quality deteriorates. We test this prediction by examining seven earnings attributes: accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism(Francis, LaFond, Olsson, and Schipper 2004). These attributes are generally understood as (overlapping) measures of accounting quality (Verdi 2005).

Using a sample of 72 identified backdating firms (314 firm-year observations) and 5760 non-backdating firms (34,476 firm-year observations), we show that backdating firms have lower accrual quality, less smoothed earnings, and report less

[16] Section 403 of the Sarbanes-Oxley Act requires companies to report their option grant "before the end of second business day."
[17] Note that backdating need not be illegal. As Eric Lie points out on his website, however, if firms comply with the requirements under which backdating *is* legal, there would be little advantage associated with backdating. Lie concludes that backdating is illegal in most cases. (See: http://www.biz.uiowa.edu/faculty/elie/backdating.htm).
[18] See: Johnston (2004), Maremont (2005), Forelle and Bandler (2006b; 2006a).
[19] See: Lie (2005), Lie and Heron (2006), Bernile, Jarell, and Mulcahey (2006), Fleischer (2006), Narayanan, Schipani, Seyhun (2006), Walker (2006), Bizjak, Lemmon, and Whitby (2007), Cicero (2007), Dhaliwal, Erickson, Heitzman (2007), Jain and Rezaee (2007).

timely. The same group of firms, however, also shows more predictable, more conservative, and more persistent earnings. These results hold after controlling for "innate" determinants of earnings attributes, i.e., fundamental, non-discretionary, economic factors that affect the financial reporting of the firm (Francis et al. 2004). Controlling for innate factors is especially important in this case, as Lie (2005) reports that backdating is concentrated in small firms, technology stocks, and firms with high stock price volatility. We do not find significant differences in value relevance between the two groups of firms. To the extent that we successfully control for "innate" differences between backdating and non-backdating firms, we document a significant impact of top executive traits on six out of seven earnings attributes.

We interpret these findings in the light of recent concerns voiced in the literature that contend that these earnings attributes may not in fact be unambiguous measures of accounting quality (Verdi 2005; Barton, Hansen, and Pownall 2007).[20] Indeed, to some extent managers may have to sacrifice "accrual quality" to improve "persistence" or "predictability". In the context of our setting, three earnings attributes signal that the backdating firms have higher accounting quality than their peers; three attributes suggests the opposite. With an eye towards this ambiguity, we ask whether individual investors can use information from the firm's annual report to obtain a clearer signal of accounting quality than provided by earnings attributes.

Accounting ratios have been a staple of financial statement analysis textbooks for years. We compute (line-item-based) ratios that are suggested as diagnostic tests of accounting problems in most textbooks (see, e.g., Penman (2007)). In matched sample tests, we compare ratios based on sales, expenses, profit margin, and asset turnover between backdating and matched sample firms and report results that are consistent with backdating firms delaying expenses and aggressively booking sales. These results can be interpreted as further evidence on our main research question about the influence of individual top executives on the properties of accounting information. In contrast to the tests based on earnings attributes, accounting ratios consistently show that the financial statements of backdating firms are of lower quality than those of their peers.

We subject our results to several sensitivity checks and show that the findings

[20] In fact, Francis et al. (2004) show that achieving improvements on some accounting quality measures are more associated with (cost-of capital) benefits than others. In their case, timeliness and conservatism are not associated, and predictability is *negatively* associated with the cost of capital.

are robust to different econometric specifications and alternative research designs.

As in the handful of previous studies on the impact of top executive characteristics on accounting choices made in firms, we show that executive traits are an important determinant. At the same time, our results are, *prima facie,* not easy to reconcile with those in Francis et al. (2008) who conclude that *reputable* CEOs are present more in firms with low earnings quality. The after the fact reputation of managers of backdating firms is clearly poor. But one would be well-advised to guard against retrospectively applying this reputation to the time period when the firm had not yet been accused of illegal actions. Nevertheless, Francis et al. (2008) argue that more talented managers are matched with firms with poor earnings quality (as these stand to benefit more from talent). Malmendier and Tate (2007) show that reputable "superstar" CEOs engage in more earnings management after winning prestigious awards from the business press. Their interpretation is, however, less optimistic as they attribute the increased earnings management to attempts of the CEO to uphold his or her favorable press coverage. Our results suggests at least two conclusions vis-à-vis this earlier work. First, the (press-) reputation of managers may still be a noisy proxy of those managerial traits that matter when making reporting choices. Second, given the ambiguous signals about earnings quality provided by many of the conventional quality measures in the accounting literature, care must be exercised when forming conclusions on the basis of these proxies. Indeed, our results suggest that looking at ratios based on line-item financial statement data might yield less equivocal interpretations.

3.2 Hypothesis development

3.2.1 Review of the literature on the effect of executive traits on accounting choices

Existing theories of accounting choice focus on economic fundamentals to explain the variation across firms in financial reporting practices (Fields, Lys, and Vincent 2001). While this body of work has significantly improved our understanding of how contractual and regulatory forces shape accounting properties, it is generally recognized that firms with similar fundamentals make substantially different reporting choices. This begs the question what has been overlooked in extant work. Recently, a handful of studies have suggested to address this question by exploring how differences in characteristics of top-level managers affect accounting choices

(Malmendier and Tate 2007; Francis et al. 2008). Specifically, controlling for other fundamental forces, do the personality traits of a manager matter with regard to accounting properties? Researchers in finance, management, and economics have already documented that differences in *type* of executive can influence operational, financing, and many other decisions in the firm (Hambrick and Mason 1984; Rotemberg and Saloner 2000; Bertrand and Schoar 2003; Richardson, Tuna, and Wysocki 2003; Scherr and Jensen 2006; Malmendier, Tate, and Yan 2007). One barrier to this type of work is to identify what personality trait of managers is important with regard to explaining accounting choices. When identified, the next question is equally thorny: what proxy can be used to facilitate large sample studies on the accounting effects of managerial traits? Both Francis et al. (2008) and Malmendier and Tate (2007) rely on press coverage as a measure of managerial reputation. Francis et al. (2008) essentially argue that more talented managers (who have a stronger reputation) are more valuable in firms with poor earnings quality and tend to be hired by these firms. Malmendier and Tate (2007) report that the earnings quality of firms deteriorates after a CEO becomes a superstar, which also yields a negative association between reputation and earnings quality, but in their interpretation this happens because the behavior of a talented manager changes to the disadvantage of the firm after achieving superstar status. These studies are important first steps in understanding the relation between executive traits and accounting choices.

We take a different approach and argue that when managers engage in backdating, they reveal a personality trait that suggests that they are willing to mislead shareholders, tax authorities and other stakeholders to the firm to obtain personal benefits. Earlier experimental studies have suggested that this personality trait spills-over to reporting decisions (Harrell and Harrison 1994; Booth and Schulz 2004). Thus, we expect that backdating executives have few scruples to reduce the quality of accounting earnings if this helps them to achieve some personal gain. On average, therefore, we expect the earnings quality of backdating firms to be lower than that of their peers, controlling for other fundamental determinants of earnings attributes. More formally,

H_1: Firms that have engaged in option backdating have lower earnings quality than firms that have not backdated their options.

3.2.2 Earnings attributes as measures of earnings quality

Francis et al. (2004) synthesize much of the empirical research on the properties of accounting earnings into seven desirable "earnings attributes", each of which captures some dimension of the uncertainty about the future free cash flows to common equity. We discuss these attributes here whereas their detailed computation is described in Appendix 1. Francis et al. distinguish two groups: accounting-based and market-based attributes. Accrual quality, persistence, predictability, and smoothness are measured using financial statement information only, and hence are accounting-based. Value-relevance, timeliness, and conservatism are measured using earnings-return regressions and therefore are market-based. Francis et al. also differentiate between "discretionary" and "innate" components of each attribute since earnings properties are determined by both innate, fundamental economic forces of the firm's contracting and operating environment as well as by discretionary, managerial decisions. This distinction is especially important in our setting as we believe that the most direct evidence of the impact of executive traits on earnings quality will be found in the discretionary attributes (see also, Francis et al. (2008)).

Although Francis et al. recognize that some significant correlations between earnings attributes exist, they also conclude that the attributes are distinct (and overlap each other only to a limited extent). In contrast, some recent papers use principal components analysis to aggregate the attributes into one-dimensional constructs. Verdi (2005) reports that accruals quality, earnings smoothness, and earnings predictability together proxy for the information available about a firm, whereas value-relevance and timeliness capture the relation between stock returns and accounting information.[21] In a similar effort, Barton et al. (2007) derive three principal components: persistence, predictability and smoothness are grouped together as a measure of "sustainability", whereas timeliness and conservatism each are treated as a separate factor capturing "representational faithfulness" and "bias", respectively. One implication of these analyses is that earnings attributes are not distinct, but in fact capture the same underlying construct. In also turns out that investors do not seem to care equally about each of the attributes (Barton et al. 2007). Francis et al. (2004) and Verdi (2005) report that accounting-based attributes are associated with greater cost-of-capital effects than market based attributes. Barton et al. (2007) document that

[21] In Verdi's study, conservatism and earnings persistence do not load on either one of the factors derived from the principal components analysis.

persistence and timeliness are valued more by investors. Taken together, it seems that accounting-based attributes are associated with the greatest benefits for the firm.

Lowering the quality of those attributes that are valued by investors is more costly to managers, both in personal terms and by potentially attracting scrutiny from shareholders. Indeed, if firm value is affected by low accounting quality, then the personal wealth of managers will be affected as well through their equity compensation. Thus, executives may choose not to lower the quality across all dimensions to the same extent. Based on the findings of prior work, we expect that the cost of reducing quality of accounting-based attributes is higher and the difference in accounting quality between backdating and non-backdating firms will be less pronounced for these attributes.

H_2: The difference in accounting quality between firms that have engaged in option backdating and those that have not is smaller for accounting-based earnings attributes than for market-based earnings attributes.

3.3 Sample and descriptive statistics

We use a list of companies that have disclosed government probes, misdated options, restatements, and/or executive departures provided by The Wall Street Journal Online as our source for firms that are under scrutiny for possible option backdating.[22] Our sample time period is from 1991 to 2005.[23] We verify when the company is suspected to have *first* backdated options as well the time period over which backdating (allegedly) occurred. This yields a sample of 72 backdating firms (314 firm-year observations). We verify whether the investigation period is equal to a CEO's tenure. Appendix 2 lists the firms included in the sample as well as the time period in which they have engaged in backdating.

We use financial data from the Compustat Annual Industrial and Research files and market data from the CRSP files. Table 1 presents the number of observations by year with available data to compute each of the earnings attributes as

[22] http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html. We used the data available in August 2007.

[23] WSJ online reports backdating for 10 firm-year observations before 1991. These firm-year observations do not survive our data requirement filters or are removed when we exclude outliers. To increase the power of our tests, we decide against a sample period that starts from the first recorded backdating in 1981. Nevertheless, when we extend our sample period back to 1981, all of our results remain qualitatively the same although with slightly weaker significance levels.

defined by Francis et al. (2004). Panel A presents the observations used in the tests. The estimation of earnings attributes described in Francis (2004) involves time-series regressions using rolling firm-specific 10-year windows. In addition, to ensure that comparisons between attributes are not driven by differences in samples, Francis et al. (2004) require firms to have data available for all seven attributes for all firm-years. We relax these strict sample selection criteria somewhat to increase the number of backdating firms in our sample. Specifically, we use rolling firm- specific *6*-year windows (*t-5, …, t*). Thus, as we start our sample in 1991, we obtain data from 1986 onward. The cost of this procedure is that our measures are likely to have more noise.

Table 1
Sample Composition

This table presents the year-by-year distribution of backdating and non-backdating firms included in the final sample for the main tests (Panel A) and the full sample (Panel B). To be included in the final sample, firms need to have data available for the calculation of all seven earnings attributes as defined in Appendix 1. The full sample contains firms with data available to compute at least one of the seven earnings attributes in any given year. The sample period is from 1991 to 2005.

Panel A: Final Sample Used in the Tests				**Panel B: Full Sample**			
Year	# Firms	# Backdating firms	Total	Year	# Firms	# Backdating firms	Total
1991	1999	1	2000	1991	6813	7	6820
1992	2131	2	2133	1992	7125	8	7133
1993	2286	3	2289	1993	8281	10	8291
1994	2341	3	2344	1994	8748	14	8762
1995	2334	5	2339	1995	9453	25	9478
1996	2372	11	2383	1996	9667	37	9704
1997	2340	17	2357	1997	9457	58	9515
1998	2361	22	2383	1998	9663	73	9736
1999	2421	33	2454	1999	9741	82	9823
2000	2470	39	2509	2000	9335	99	9434
2001	2626	47	2673	2001	8744	103	8847
2002	2849	39	2888	2002	8354	94	8448
2003	2926	46	2972	2003	8046	80	8126
2004	2789	38	2827	2004	7632	68	7700
2005	231	8	239	2005	6727	59	6786
Mean	*2298*	*21*	*2319*	*Mean*	*8519*	*55*	*8574*
Total	**34476**	**314**	**34790**	**Total**	**127786**	**817**	**128603**

We address this issue by using ranks instead of the original values of each attribute. To gauge the impact of these sample selection criteria, we report in Panel B of Table 1 the number of (backdating and non-backdating) observations with sufficient data to estimate at least one earnings attribute. The selection criteria bias the sample towards surviving firms. We remove the bottom and top 1 percent of the earnings attributes observations to mitigate the impact of outliers.[24] Our final sample of non-backdating firms with available data to estimate all seven earnings attributes comprises 34,476 firm-year observations (5760 unique firms).

Table 2—Panel A presents the descriptive statistics of the seven earnings attributes for non-backdating firms. Panel B holds the same, but for the sample of backdating firms. Note that all earnings attributes are coded such that high values denote *lower* accounting quality. The distribution of earnings attributes for non-backdating firm is comparable to the one reported by Francis et al. (2004). For example, these authors report average (median) *Accrual Quality*, *Timeliness*, and *Conservatism* of 0.026 (0.019), -0.466 (-0.465), and -0.547 (-1.000), whereas we find mean (median) values of 0.028 (0.017), -0.216 (-0.314), and -0.434 (-1.000) respectively.

Compared to the non-backdating firms, the average (median) values of *Accrual Quality* and *Smoothness*, as shown in Panel B of Table 2, are higher for backdating firms, implying worse accounting quality for these attributes. For all other earnings attributes, the means are lower for backdating firms, suggestive that these firms have in fact higher accounting quality than the remainder of the sample. The median values suggest the same pattern, except for *Timeliness*; the median backdating firm has less timely earnings than the median non-backdating firm. [25]

Panel C presents the Pearson (Spearman) correlation for the earnings attributes and an indicator variable, *Backdating*, which takes the value of unity if the sample firm in year t has been identified as having backdated its stock options and zero otherwise. The correlations between *Backdating* and the earnings attributes provide first evidence that backdating firms have different earnings attributes than non-backdating firms. All earnings attributes are significantly associated with *Backdating*

[24] We obtain very similar results when we winsorize the sample at the bottom and top 1 percent instead of eliminating these observations.
[25] The correlation table in Francis et al. (2004) provides also evidence that the earnings attributes are not completely overlapping and therefore that different earnings attributes might respond differently to managerial actions.

Table 2

Summary Statistics on the Earnings Attributes of Backdating and Non-backdating Firms

This table provides the distribution of seven earnings attributes (refer to Appendix 1 for variable definitions) for non-backdating (Panel A) and backdating firms (Panel B). The columns present summary statistics calculated across all available firm-years. Panel C present Pearson (Spearman) correlations above (below) the diagonal between the variables. Corresponding p-values are reported in italics.

Panel A: Non-backdating firms

Attribute	Mean	Std. Dev.	10%	25%	Median	75%	90%	N
AccrualQuality	0.028	0.031	0.004	0.008	0.017	0.035	0.066	34476
Predictability	1.151	3.373	0.085	0.177	0.402	0.913	2.053	34476
Persistence	-0.253	0.504	-0.936	-0.563	-0.219	0.094	0.356	34476
Smoothness	0.787	0.428	0.277	0.456	0.743	1.034	1.336	34476
Relevance	-0.254	0.458	-0.845	-0.652	-0.297	0.127	0.418	34476
Timeliness	-0.216	0.582	-0.908	-0.727	-0.314	0.211	0.623	34476
Conservatism	-0.434	22.434	-8.019	-1.336	-1.000	0.732	7.358	34476

Panel B: Backdating firms

Attribute	Mean	Std. Dev.	10%	25%	Median	75%	90%	N
AccrualQuality	0.031	0.031	0.005	0.010	0.021	0.039	0.075	314
Predictability	0.709	0.977	0.053	0.135	0.368	0.868	1.858	314
Persistence	-0.361	0.588	-1.179	-0.802	-0.252	0.061	0.321	314
Smoothness	0.919	0.473	0.363	0.572	0.894	1.153	1.547	314
Relevance	-0.251	0.467	-0.840	-0.643	-0.335	0.089	0.473	314
Timeliness	-0.113	0.598	-0.851	-0.639	-0.202	0.340	0.770	314
Conservatism	-2.622	25.452	-11.568	-2.159	-1.000	-0.214	7.258	314

Panel C: Correlations among the backdating indicator variable and earnings attributes

	Backdating	*Accrual Quality*	*Predictability*	*Persistence*	*Smoothness*	*Relevance*	*Timeliness*	*Conservatism*
Backdating	1.000	0.010	-0.012	-0.020	0.029	0.001	0.017	-0.009
		0.053	*0.020*	*0.000*	*0.000*	0.913	*0.002*	*0.086*
AccrualQuality	0.016	1.000	0.159	0.127	0.353	0.032	0.049	0.009
	0.004		*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.094*
Predictability	-0.009	0.284	1.000	0.061	0.104	0.019	0.014	0.000
	0.077	*0.000*		*0.000*	*0.000*	*0.000*	*0.008*	0.959
Persistence	-0.017	0.161	0.251	1.000	0.058	0.057	0.040	0.009
	0.002	*0.000*	*0.000*		*0.000*	*0.000*	*0.000*	*0.008*
Smoothness	0.027	0.411	0.304	0.060	1.000	0.044	0.053	0.011
	0.000	*0.000*	*0.000*	*0.000*		*0.000*	*0.000*	*0.036*
Relevance	0.000	0.019	0.102	0.058	0.046	1.000	0.442	0.021
	0.947	*0.000*	*0.000*	*0.000*	*0.000*		*0.000*	*0.000*
Timeliness	0.017	0.031	0.068	0.025	0.045	0.452	1.000	0.001
	0.002	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*		0.861
Conservatism	-0.020	0.035	0.047	0.041	0.024	0.074	0.007	1.000
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	0.191	

except for *Relevance*. The correlation between *Backdating* and *Accrual Quality, Smoothness,* and *Timeliness* is positive and significant at the1 percent level or better. This suggests that backdating firms have lower earnings quality as measured by these three attributes. At the same time, the correlation between *Backdating* and *Predictability, Persistence,* and *Conservatism* is negative and significant at the 10 percent level or better, which implies better accounting quality for backdating firms.

The correlations among the seven earnings attributes confirm earlier findings that these attributes overlap. For example, *Accrual Quality* and *Smoothness* are strongly positively correlated (correlation equals 0.353, p-value<0.001). More in general, the correlations between the accounting-based attributes are significant.

Following Francis et al. (2004), we view earnings attributes as the joint outcome of managerial discretion and intrinsic, fundamental economic forces. By controlling for these latter (innate) factors, Francis et al. tease out the discretionary component of the earnings attributes. Controlling for innate determinants of earnings attributes is of especial importance in our context, as prior evidence suggests that backdating is more prevalent for high-tech firms, smaller firms, and firms with high stock price volatility (Heron and Lie 2006). Table 3 presents the descriptive statistics for eight innate determinants of earnings attributes. We discuss these determinants briefly below and provide more complete definitions in Appendix 1.

Backdating firms are on average somewhat larger than non-backdating firms (mean *Size* equals 6.785 and 5.292, respectively), which is somewhat surprising given earlier evidence. Average cash flow variability $\sigma(CFO)$, sales variability $\sigma(sales)$, and operating cycle (OperCycle) do not differ much between the two groups. Untabulated tests only show a significant difference for the median cash flow variability. Backdating firms, however, on average report fewer losses over the past six years (*NegEarn*) than non-backdating firms (mean equals 1.338 and 1.719, respectively). In addition, the intangible intensity (*Int_Intensity*), i.e. the sum of the firm's reported R&D and advertising expense as a proportion of its sales revenues, is lower for backdating firms (mean equals 0.043) than for non-backdating firms (mean equals 0.119), albeit that unreported test show this difference not to be significant. In contrast, capital intensity (*Cap_Intensity*), which is the ratio of net book value of property, plant, and equipment to total assets is significantly lower for backdating firms (mean equals 0.204) than for non-backdating firms (mean equals 0.322).

Table 3
Summary Statistics on the Innate Determinants of Earnings Attributes

This table provides the distribution of the innate determinants of earnings attributes (refer to Appendix 1 for variable definitions) for non-backdating (Panel A) and backdating firms (Panel B). The columns present summary statistics calculated across all available firm-years.

Panel A: Non-backdating firms

Innate determinant	Mean	Std. Dev.	10%	25%	Median	75%	90%	N
Size	5.292	2.330	2.331	3.579	5.195	6.925	8.432	34476
σ(CFO)	0.116	0.409	0.025	0.041	0.072	0.125	0.221	34476
σ(sales)	0.226	1.042	0.047	0.082	0.147	0.258	0.427	34476
OperCycle	4.691	0.780	3.846	4.306	4.754	5.149	5.499	33504
NegEarn	1.719	1.968	0.000	0.000	1.000	3.000	5.000	34476
Int_Intensity	0.119	5.066	0.000	0.007	0.018	0.043	0.090	34068
Int_Dummy	0.130	0.337	0.000	0.000	0.000	0.000	1.000	34476
Cap_Intensity	0.322	0.241	0.057	0.128	0.259	0.475	0.709	34459

Panel B: Backdating firms

Innate determinant	Mean	Std. Dev.	10%	25%	Median	75%	90%	N
Size	6.785	1.415	5.118	5.775	6.778	7.720	8.703	314
σ(CFO)	0.113	0.111	0.032	0.054	0.079	0.136	0.208	314
σ(sales)	0.201	0.237	0.068	0.097	0.142	0.233	0.351	314
OperCycle	4.643	0.761	3.533	4.288	4.730	5.148	5.471	313
NegEarn	1.338	1.552	0.000	0.000	1.000	2.000	4.000	314
Int_Intensity	0.043	0.046	0.005	0.010	0.030	0.064	0.102	314
Int_Dummy	0.051	0.220	0.000	0.000	0.000	0.000	0.000	314
Cap_Intensity	0.204	0.195	0.040	0.072	0.138	0.244	0.456	314

Int_Dummy is an indicator variable equal to 1 for firms with *Int_Intensity*=0, and zero otherwise. The descriptive statistics confirm the earlier result for *Int_Intensity* that backdating firms more often report zero R&D or advertising expenses.

Together, these findings suggest that differences in innate determinants between backdating and non-backdating firms are mostly concentrated in size, the incidence of reported losses and the capital and intangible intensity of these firms.

3.4 Empirical analysis of the earnings attributes of backdating and non-backdating firms

3.4.1 Main findings

In this section we examine the earnings attributes of backdating and non-backdating firms in an effort to provide an answer to our research question on how differences in managerial traits affect the financial reporting behavior of firms. We estimate the following equation using the combined sample of backdating and non-backdating firms:

$$Attribute_j = \lambda_0 + \lambda_1 Backdating + \lambda_2 Size + \lambda_3 OperCycle + \lambda_4 \sigma(CFO) + \lambda_5 \sigma(sales) + \lambda_6 NegEarn + \lambda_7 Int\_Intensity + \lambda_8 Int\_Dummy + \lambda_9 Cap\_Intensity + \varepsilon_j \quad (1)$$

$Attribute_j$ is one of the seven earnings attributes (*AccrualQuality, Persistence, Predictability, Smoothness, Relevance, Timeliness,* and *Conservatism*; see Appendix 1 for all variable definitions). We estimate pooled rank regressions using Newey-West (1987) standard errors, which are heteroskedasticity and autocorrelation consistent.[26] [27] We rank each dependent variable each year and form 20 portfolios. We then assign each firm based on its rank to one of these portfolios; firms in the top portfolio have the highest (5 percent) values on the earnings attribute, while firms in the bottom portfolio have the lowest (5 percent) values. Given our coding scheme, this places firms with the lowest (highest) accounting quality in the top (bottom) portfolios. We use the portfolio rank of each attribute as the dependent variable in our regressions to alleviate concerns about outliers and to reduce the problems of measurement error due to short estimation windows.

Table 4 presents our findings. Consistent with Francis et al. (2004), the innate determinants are jointly important to explain the variance in the seven earnings attributes. Adjusted R2 are of similar magnitude as in Francis et al. for the market-based attributes, but somewhat lower for the accounting-based attributes.

Hypothesis H1 states that the earnings attributes of backdating firms will be of lower quality than those of non-backdating firms. We only find limited support for this hypothesis. Recall that all attributes are coded such that higher values denote lower accounting quality. Thus, under H1, the sign of the coefficient on *Backdating* should be positive. We find indeed positive and significant coefficients for *AccrualQuality* (coefficient=1.375, p-value=0.000), *Smoothness* (coefficient=2.015, p-value=0.000), and *Timeliness* (coefficient=0.760, p-value=0.018). In contrast, however, we find that backdating firms appear to have higher earnings quality as measured by *Persistence* (coefficient=-0.744, p-value=0.028), *Predictability* (coefficient=-1.791, p-value=0.000), and *Conservatism* (coefficient=-1.112, p-value=0.000). The *Relevance* of earnings between the two groups does not

[26] We use rank regressions to reduce the errors-in-variables problem in the dependent variable. However, we obtain basically the same results if we use the original values of the earnings attributes.

[27] A pooled regression framework is more appropriate in our setting given the temporal pattern of backdating (with few beginning-of-sample period observations). When we use Fama-MacBeth (1973) estimates of Equation (1) derived from annual cross-sectional rank regressions, our results are robust (unreported), although *Persistence* is only marginally significant (p-value=0.15, two-tailed).

Table 4
Pooled Rank Regressions of Earnings Attributes on Stock Option Backdating Status and Innate Determinants

The table presents pooled rank regressions of each of the seven earnings attributes on an indicator variable (1=backdating firm, 0=otherwise) and innate determinants. The columns contain p-values based on Newey-West (1987) standard errors below the estimated coefficients. Significant coefficients (p-value<10 percent) are highlighted by using ***bold and italics***. The sample consists of firms with data available on all variables needed to compute the seven earnings attributes (refer to Table 1 for details). We delete the top and bottom 1 percent of observations to control for outliers. Variables are defined in Appendix 1. Intercepts are not reported. The number of observations equals 34,790.

$$Attribute_j = \lambda_0 + \lambda_1 Backdating + \lambda_2 Size + \lambda_3 OperCycle + \lambda_4 \sigma(CFO) + \lambda_5 \sigma(sales)$$
$$+ \lambda_6 NegEarn + \lambda_7 Int\_Intensity + \lambda_8 Int\_Dummy + \lambda_9 Cap\_Intensity + \varepsilon_j$$

Panel A Regressions of earnings attributes on stock option backdating status and innate determinants

Equations	Dependent	***Backdating***	***Size***	***OperCycle***	***σ(CFO)***	***σ(sales)***	***NegEarn***	***Int_Intensity***	***Int_Dummy***	***Cap_Intensity***	***Adj R2***
Eq.1	*AccrualQuality*	1.375	-0.642	0.476	2.974	0.213	0.971	-0.007	-0.355	-4.146	0.401
		0.000	***0.000***	***0.000***	***0.000***	0.170	***0.000***	0.474	***0.000***	***0.000***	
Eq.2	*Persistence*	-0.744	0.015	0.333	-0.360	0.053	0.485	0.006	0.233	1.337	0.026
		0.028	0.361	***0.000***	***0.061***	***0.073***	***0.000***	0.243	***0.013***	***0.000***	
Eq.3	*Predictability*	-1.791	0.909	0.123	2.039	0.258	1.387	-0.008	0.085	0.520	0.199
		0.000	***0.000***	***0.004***	***0.010***	***0.006***	***0.000***	0.291	0.328	***0.001***	
Eq.4	*Smoothness*	2.015	-0.091	0.133	-3.256	-0.090	1.172	0.001	-0.273	0.814	0.143
		0.000	***0.000***	***0.001***	***0.000***	***0.009***	***0.000***	0.603	***0.002***	***0.000***	
Eq.5	*Relevance*	-0.321	0.297	0.201	-0.243	0.022	0.417	-0.019	0.243	0.497	0.019
		0.329	***0.000***	***0.000***	0.238	0.554	***0.000***	***0.000***	***0.011***	***0.001***	
Eq.6	*Timeliness*	0.760	0.229	0.120	-0.066	0.120	0.392	-0.018	-0.111	0.366	0.015
		0.018	***0.000***	***0.006***	0.762	***0.000***	***0.000***	***0.001***	0.247	***0.017***	
Eq.7	*Conservatism*	-1.112	0.009	0.101	-0.726	-0.002	0.246	-0.011	0.137	0.304	0.006
		0.000	0.560	***0.020***	***0.002***	0.955	***0.000***	***0.000***	0.144	***0.045***	

Panel B Coefficient equality tests on backdating

Contrast (sign)	F-statistic	p-value	Contrast	F-statistic	p-value	Contrast	F-statistic	p-value	Contrast	F-statistic	p-value
Eq.1 vs. Eq. 5 (+)	17.060	***0.000***	Eq.2 vs. Eq. 5 (-)	0.880	0.348	Eq.3 vs. Eq. 5 (-)	11.780	***0.001***	Eq.4 vs. Eq. 5 (+)	27.780	***0.000***
Eq.1 vs. Eq. 6 (+)	2.240	0.135	Eq.2 vs. Eq. 6 (-)	10.780	***0.001***	Eq.3 vs. Eq. 6 (-)	34.330	***0.000***	Eq.4 vs. Eq. 6 (+)	7.960	***0.005***
Eq.1 vs. Eq. 7 (+)	36.600	***0.000***	Eq.2 vs. Eq. 7 (+)	0.660	0.415	Eq.3 vs. Eq. 7 (-)	2.460	0.117	Eq.4 vs. Eq. 7 (+)	49.160	***0.000***

appear to differ.

Results are also not consistent with our hypothesis H2, in which we argue that as accounting-based attributes are more costly to reduce (since market participants seem to attach more value to these), the difference in earnings quality will be more pronounced for market-based attributes. Again, this is not the case: while backdating firms have poorer *Timeliness*, they also have better *Conservatism*. Perhaps more significantly though, there are substantial differences within the accounting-based attributes. Backdating firms have better *Predictability* and *Persistence*, but worse *AccrualQuality* and *Smoothness*.

We test hypothesis H2 more formally by estimating the seven earnings attributes in a seemingly unrelated regressions framework and by imposing cross-equation restrictions. We compare the coefficient on *Backdating* for the four accounting-based earnings attributes with each of the three market-based attributes. This procedure is appropriate as the earnings attributes continue to be portfolio ranks as before. The results are presented in Panel B of Table 4. Under hypothesis H2, we expect that the coefficient on *Backdating* is higher for market-based attributes than for accounting-based attributes. The F-tests, which impose equal coefficients on *Backdating* between two equations at the same time, show that the effect of *Backdating* on accounting-based attributes is significantly larger in five cases, while the effect of market-based measures is larger in three cases. Clearly, we cannot conclude that market-based measures generally show a more substantial reduction in quality than accounting-based measures.

3.4.2 Additional analysis

As there is substantial clustering of backdating firms in some industries, concerns can be raised that using the Compustat universe as benchmark for their earnings attributes is less appropriate. We therefore estimate Equation (1) again in a sample of firms that consists only of those 2-digit SIC industries that contain backdating firms. We further expand Equation (1) by including industry indicator variables. Results are presented in Table 5. As before, we use pooled rank regressions and base our inferences on Newey-West (1987) standard errors. Our results are consistent with those reported in Table 4. Backdating firms have better *Predictability, Persistence*, and *Conservatism*, but worse *AccrualQuality, Smoothness*, and *Timeliness*.

Table 5
Pooled Rank Regressions of Earnings Attributes on Stock Option Backdating Status and Innate Determinants in a Sample of Firms Matched on Industry

The table presents pooled rank regressions of each of the seven earnings attributes on an indicator variable (1=backdating firm, 0=otherwise) and innate determinants. The columns contain p-values based on Newey-West (1987) standard errors below the estimated coefficients. Significant coefficients (p-value<10 percent) are highlighted by using ***bold and italics***. The sample consists of firms with data available on all variables needed to compute the seven earnings attributes but drawn only from those 2-digit industries that contain backdating-firm observations (refer to Table 1 for details). Hence, the sample in this test is industry-matched. We delete the top and bottom 1 percent of observations to control for outliers. Variables are defined in Appendix 1. Intercepts are not reported. The number of observations equals 22,125.

$$Attribute_j = \lambda_0 + \lambda_1 Backdating + \lambda_2 Size + \lambda_3 OperCycle + \lambda_4 \sigma(CFO) + \lambda_5 \sigma(sales)$$
$$+ \lambda_6 NegEarn + \lambda_7 Int\_Intensity + \lambda_8 Int\_Dummy + \lambda_9 Cap\_Intensity + \varepsilon_j$$

Dependent	***Backdating***	***Size***	***OperCycle***	***σ(CFO)***	***σ(sales)***	***NegEarn***	***Int_Intensity***	***Int_Dummy***	***Cap_Intensity***	***Indus_Dummy***	***Adj R2***
AccrualQuality	1.069	-0.613	0.267	3.169	0.222	0.926	-0.001	-0.219	-2.809	Yes	0.363
	0.000	***0.000***	***0.000***	***0.001***	0.187	***0.000***	0.859	***0.048***	***0.000***		
Persistence	-0.664	-0.001	0.324	-0.363	-0.002	0.435	0.008	0.029	-0.685	Yes	0.034
	0.052	0.972	***0.000***	0.118	0.959	***0.000***	***0.056***	0.834	***0.007***		
Predictability	-1.720	0.914	0.205	2.067	0.273	1.292	-0.001	-0.110	0.656	Yes	0.209
	0.000	***0.000***	***0.001***	***0.035***	***0.023***	***0.000***	0.872	0.387	***0.017***		
Smoothness	1.508	-0.097	-0.003	-3.078	0.020	1.048	0.001	-0.294	1.153	Yes	0.158
	0.000	***0.000***	0.952	***0.001***	0.604	***0.000***	0.546	***0.027***	***0.000***		
Relevance	-0.478	0.290	0.288	-0.147	0.082	0.380	-0.019	0.119	-0.140	Yes	0.020
	0.148	***0.000***	***0.000***	0.569	0.134	***0.000***	***0.000***	0.400	0.591		
Timeliness	0.659	0.238	0.195	0.032	0.136	0.379	-0.018	-0.277	0.171	Yes	0.017
	0.041	***0.000***	***0.002***	0.908	***0.000***	***0.000***	***0.002***	***0.049***	0.512		
Conservatism	-0.839	-0.010	0.135	-0.855	-0.062	0.255	-0.009	0.189	0.261	Yes	0.009
	0.008	0.651	***0.032***	***0.007***	***0.041***	***0.000***	***0.000***	0.172	0.320		

Recent work suggests that the quality of a firm's corporate governance may impact earnings attributes (Garcia Lara, Garcia Osma, and Penalva in press). As it is easy to imagine that the governance characteristics of a firm also affect the likelihood of becoming engaged in the option backdating scandal, we conduct some additional analysis to evaluate the extent of its effect on our findings. We obtain corporate governance scores (*G-index*) from Andrew Metrick's website.[28] This dataset contains firm-specific governance scores for the period 1990-2006. The *G-index* is constructed using data from the Investor Responsibility Research Center (IRRC). Details on the construction of the index are described in Gompers et al. (2003). A *G-index* score is available for 57 backdating firms (305 firm-years) and for 1579 non-backdating firms (13,702 firm-year observations). We include the *G-index* as an additional regressor in Equation (1) and estimate pooled rank regressions as before. Our results (not tabulated) show that while the *G-index* is a significant explanatory variable for *Persistence, Predictability, Smoothness,* and *Relevance*, none of our original inferences is affected by its inclusion in Equation (1).

3.4.3 Discussion

Thus, our regression findings, which tease out the discretionary reporting behavior from that caused by fundamental innate factors, confirm the picture that arises from the simple correlations that we presented before. While it is clear that the accounting properties of these two groups of firms differ and that these differences can be ascribed to the discretionary actions of the managers involved, it is also clear that the revealed managerial traits associated with backdating do not unambiguously lead to lower accounting quality as measured by these seven earnings attributes.

It also appears that firms compensate lower quality on one attribute with higher quality on another *within* the same subset of accounting-based or market-based attributes, respectively. This apparent balancing could be a strategy to reduce the adverse economic consequences of lowering accounting quality across the board. It could also be that the lower *AccrualQuality* provides managers with the reporting means to increase the persistence and predictability of their earnings, perhaps in an attempt to avert investor scrutiny by reducing their uncertainty about future cash flows. Similarly, although backdating firms have more conservative earnings, they are also less timely. Thus, while backdating firms reflect economic losses more quickly

[28] http://finance.wharton.upenn.edu/~metrick/data.htm

into earnings than gains compared to non-backdating firms, their accounting numbers do not match up as well with economic fundamentals as their peers. Again, this might be viewed as a the outcome of a "balancing" strategy, where the better performance on conservatism is used to direct the attention of investors away from the fact that earnings do not line up with economic income.

All of this remains speculative and this is caused in part by a lack of understanding in the literature of the mutual relations between the seven earnings attributes (Verdi 2005; Barton et al. 2007). To obtain a more unequivocal understanding of the reporting behavior of (non-)backdating firms, we conduct a ratio analysis inspired by treatments in many financial statement textbooks about how to assess the quality of annual reports. This exercise may also provide some background against which our findings on earnings attributes can be evaluated.

3.5 Ratio analysis for matched samples of backdating and non-backdating firms

Financial statement analysis has traditionally been the recommended approach to ascertain the quality of a firm's annual report (Penman 2007). Detecting intertemporal income shifting is a key element of such analysis. In particular, we conjecture that issues surrounding the application of revenue recognition and matching principles provide a good starting point for evaluating accounting quality (Penman 2003). While no large-sample study can expect to achieve the level of understanding gleaned from a well-executed fundamental analysis, we rely on easy-to-implement *quality diagnostics* that have been recognized as helpful in detecting manipulation of accounting numbers (Penman 2007). While the list of potential quality diagnostics that we could have used is lengthy, we use the following criteria to guide our choice. First, data needed to compute the quality diagnostic should be available for a broad cross section of our sample. This eliminates any diagnostic that is industry-specific.[29] Second, as we are concerned with (the influence of managerial traits on) the overall-quality of accounting, we only consider "summary" diagnostics that deal with the key products of the financial statements (sales, expenses, profits, assets).

Our quality diagnostics aim to detect manipulation of sales revenues, expenses,

[29] We also believe that this restriction helps to separate out differences in disclosure from earnings manipulation. Indeed, one reason why data may not be available for some firms is because they decided against disclosing details.

and profits. We discuss some diagnostics below for illustrative purposes and provide complete descriptions in Appendix 1. The diagnostics used to detect sales manipulation commonly rely on the idea that cash flow from sales cannot be manipulated by accounting, so differences between cash flow from sales and sales revenues are due to accounting accruals. In this spirit, we compute Revenues/Cash flow from operations and other ratios that compare sales revenues with accounting accruals (e.g., Revenues/Accounts receivable). Expense manipulation is indicated by diagnostics that relate discretionary expenses to the level of sales activity in the firm. Thus, we use Selling, General, and Administrative Expense/Revenues as a diagnostic for the amount of SG&A expense conditional on sales revenues. Finally, we use diagnostics based on profit margin (operating income/sales) and asset turnover (sales/net assets) to signal potential manipulation of net income. The basic intuition for using asset turnover is that accruals reflected in earnings are also reflected in net assets by the implications of double-entry bookkeeping. Thus, if managers have recognized revenues optimistically in the past, net assets will be positively biased (see also, Barton and Simko 2002). Overstated net assets generate comparatively fewer sales and consequently, asset turnover is lower for these firms. High profit margins may result from shifting expenses to future periods, which is also indicative of earnings management.

Taken together, our diagnostics provide a comprehensive first assessment of the quality of financial statements based directly on the reporting behavior at the level of individual line items. Comparing the comprehensiveness of seven earnings attributes and our diagnostic tests, we may perceive that our diagnostics are only accounting based. However, conceptually, our diagnostics also reflect market attributes as these manifest themselves in earnings through accruals. For example, firms which recognize revenues (losses) less (more) aggressively will have lower earnings and are more conservative compared to firms which do the opposite. At the same time, the accruals will also influence the timeliness and the value relevance of earnings in the sense that whether accruals are reported in a timely manner and how well accruals reflect the true economic performance of firms.

In the design of our tests, we are aware of the fact that any particular score on the quality diagnostics is meaningless (i.e., scores do not map neatly into a continuum of accounting quality). What matters is the score of a firm compared with its peer. We therefore use a matched-sample design, in which we match each backdating firm each

Table 6
Distribution of Backdating Firm-Year Observations by Industry

This table presents the distribution of backdating firm-year observations used in the financial statement analysis tests by four-digit SIC industry.

SIC	Industry Name	N	SIC	Industry Name	N
1311	Crude Petroleum & Natural Gas	8	4899	Communications Services, NEC	8
1531	Operative Builders	8	5045	Wholesale-Computers & Peripheral Equipment & Software	9
2711	Newspapers: Publishing or Publishing & Printing	4	5093	Wholesale-Scrap & Waste Materials	3
2834	Pharmaceutical Preparations	17	5211	Retail-Lumber & Other Building Materials Dealers	11
2836	Biological Products, (No Diagnostic Substances)	6	5600	Retail-Apparel & Accessory Stores	3
2842	Specialty Cleaning, Polishing and Sanitation Preparations	10	5700	Retail-Home Furniture, Furnishings & Equipment Stores	7
3290	Abrasive, Asbestos & Misc Nonmetallic Mineral Prods	7	5712	Retail-Furniture Stores	3
3559	Special Industry Machinery, NEC	29	5812	Retail-Eating Places	21
3571	Electronic Computers	6	5912	Retail-Drug Stores and Proprietary Stores	12
3572	Computer Storage Devices	19	5940	Retail-Miscellaneous Shopping Goods Stores	13
3576	Computer Communications Equipment	25	5945	Retail-Hobby, Toy & Game Shops	11
3577	Computer Peripheral Equipment, NEC	6	5961	Retail-Catalog & Mail-Order Houses	10
3585	Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip	6	6324	Hospital & Medical Service Plans	4
3661	Telephone & Telegraph Apparatus	17	6331	Fire, Marine & Casualty Insurance	11
3663	Radio & Tv Broadcasting & Communications Equipment	22	6794	Patent Owners & Lessors	11
3672	Printed Circuit Boards	13	7311	Services-Advertising Agencies	5
3674	Semiconductors & Related Devices	117	7330	Services-Mailing, Reproduction, Commercial Art & Photography	4
3678	Electronic Connectors	12	7359	Services-Equipment Rental & Leasing, NEC	4
3812	Search, Detection, Navigation, Guidance, Aeronautical Sys	6	7370	Services-Computer Programming, Data Processing, Etc.	21
3825	Instruments For Meas & Testing of Electricity & Elec Signals	5	7372	Services-Prepackaged Software	144
3827	Optical Instruments & Lenses	20	7373	Services-Computer Integrated Systems Design	21
3841	Surgical & Medical Instruments & Apparatus	6	7374	Services-Computer Processing & Data Preparation	12
3842	Orthopedic, Prosthetic & Surgical Appliances & Supplies	10	7812	Services-Motion Picture & Video Tape Production	5
3845	Electromedical & Electrotherapeutic Apparatus	7	8060	Services-Hospitals	15
4412	Deep Sea Foreign Transportation of Freight	2	8200	Services-Educational Services	12
4812	Radiotelephone Communications	5	8700	Services-Engineering, Accounting, Research, Management	7
4841	Cable & Other Pay Television Services	6	*Total*		*786*

year to its closest-size four-digit SIC code industry competitor. We code the sales and expense quality diagnostic such that a negative mean (median) difference implies lower accounting quality (as measured by the diagnostic) for backdating firms compared with their industry peers. As the data requirements are less strict for the tests we describe below than for the earnings attributes tests, we have an initial sample of backdating firms that comprises 786 firm-years. There is some industry clustering, most observations are in the semi-conductor (117 obs.) and prepackaged software (144 obs.) industries. Details are presented in Table 6. We remove firms that appear to have experienced extreme growth through acquisitions (as measured by changes in sales revenues of more than 50 percent) to avoid misleading inferences especially in tests based on *changes* of our quality diagnostics.[30] We also eliminate the top and bottom 1 percent of each quality diagnostic to mitigate the effect of outliers. Our final sample (matched and backdating firms) varies between 251 and 555 paired observations depending on data availability.

Table 7 presents our findings. Under hypothesis H1, we continue to expect that backdating firms have lower accounting quality than non-backdating firms. Our results are consistent with this expectation throughout. Note first, however, despite matching on size, non-backdating firms are somewhat larger than backdating firms.[31] The quality diagnostics for sales manipulations are significantly negative at the 5 percent level or better. Note, however, that the median difference of Revenue/Cash flow from operations ratio (*REVENUE/CASH)*, is *positive* (median difference=0.144), although not significant (p-value=0.408). Together, these diagnostics suggests that backdating firms more aggressively book sales than non-backdating firms. As a consequence, sales revenues become a poorer predictor of future cash flows, thus lowering the accounting quality.

Similarly, our diagnostics for expense manipulation show generally lower quality (more expense manipulation) for backdating firms. There are, however, two exceptions. First, the average difference between the two groups in Selling, General, and Administrative Expenses/Revenues (*SGA/REVENUE*) is not significant and neither is the Bad debt expense/Accounts receivable (*BADDEBT/REC*). Second,

[30] Unreported results show that our inferences about the mean difference between backdating and matched firms on all our quality diagnostics are unchanged if we do not delete firms that have been involved in acquisitions.

[31] When we control for size in the tests of the mean difference of each ratio, we continue to find very much the same pattern as reported in Table 7. Our inferences remain unchanged.

Table 7
Analysis of Quality Diagnostics Based on Accounting Ratios

This table provides the results of t-tests of the mean and Wilcoxon signed rank tests of the median for the difference between financial statement ratios of paired backdating and matched firm. Refer to Appendix 1 for variable definitions. Matching is on industry, year, and size. We delete firm pairs that have experienced extreme sales growth or decline (>50 percent) and we also delete the top and bottom 1 percent of the distribution of each ratio. Reported p-values are highlighted by using ***bold and italics*** when significant (p-value<10 percent), All p-values are from two-tailed tests. "Signed rank" is the Wilcoxon test statistic.

Variable	N*	Mean	StdDev	Median	Minimum	Maximum	t-test of the mean	p-value	Signed Rank test of the median	p-value
Panel A: Financial statement line items difference between backdating firms and non-backdating firms										
SIZE	555	0.022	0.075	0.001	-0.151	0.526	6.848	***0.000***	22948.500	***0.000***
REVENUE/CASH	548	-6.173	62.532	0.144	-519.907	210.898	-2.311	***0.021***	-3074.000	0.408
REVENUE/REC	512	-2.156	15.451	-0.458	-124.459	53.261	-3.157	***0.002***	-8969.000	***0.007***
ΔREVENUE/ΔREC	513	-8.948	32.760	-2.904	-226.961	96.058	-6.186	***0.000***	-33201.500	***0.000***
NONINCOM	550	-6.012	40.695	-0.683	-372.723	150.000	-3.465	***0.001***	-15257.500	***0.000***
SGA/REVENUE	466	-0.006	0.286	0.018	-1.825	0.842	-0.488	0.626	4416.500	0.128
PENSION/SGA	254	-0.005	0.033	-0.004	-0.125	0.258	-2.194	***0.029***	-5977.000	***0.000***
CGS/REVENUE	494	-0.155	0.394	-0.201	-2.081	1.003	-8.715	***0.000***	-26615.500	***0.000***
DA/REVENUE	532	-0.024	0.172	-0.003	-2.321	0.268	-3.176	***0.002***	-7397.000	***0.037***
RD/REVENUE	430	0.010	0.222	0.002	-2.677	0.741	0.976	0.330	7565.000	***0.000***
BADDEBT/REC	288	-0.001	0.074	0.002	-0.336	0.244	-0.159	0.874	1193.500	0.392
Δ BADDEBT /Δ REC	251	-0.338	2.600	-0.008	-29.813	4.334	-2.058	***0.041***	-1463.500	0.199
PM	551	0.109	0.640	0.020	-2.282	6.548	4.005	***0.000***	15505.000	***0.000***
ΔPM	534	0.072	0.673	0.005	-4.518	6.290	2.470	***0.014***	6837.500	***0.055***
ATO	552	0.004	0.705	-0.012	-2.587	4.742	0.140	0.889	-3617.000	0.334
ΔATO	536	-0.023	0.305	-0.005	-1.584	1.090	-1.724	***0.085***	-4370.000	0.222
Panel B: Financial statement line items change of backdating and non-backdating firms										
ATO_SAMPLE	555	-0.028	0.197	-0.001	-1.120	0.605	-3.341	***0.001***	-7507.000	***0.047***
ATO_MATCHED	536	-0.007	0.225	0.000	-0.824	1.312	-0.716	0.474	-1780.000	0.620

it appears that backdating firms expend *more* on Research & Development in percentage of their sales than their peers. All other ratios are strongly significant (p-values<5 percent) and suggest that backdating firms expend fewer costs compared to their peers to achieve a given level of sales activity. Either these firms are exceedingly efficient, or this is evidence cost manipulation.

Our final set of quality diagnostics is in a sense the most comprehensive. The idea is that both expense and sales manipulation are used to achieve higher profit margins. Increased profit margins imply, due to the articulation between the income statement and the balance sheet, higher net assets and thus lower asset turnover. Thus, manipulating firms are more likely to exhibit high and increasing profit margins and low and decreasing asset turnover. Indeed, consistent with the pattern that arises from the sales and cost manipulation diagnostics, we find that backdating firms have on average higher profit margins (i.e., net income to sales) than their peers (mean difference=0.109; p-value=0.000). We also find that the *change* in profit margin is on average higher for backdating firms (mean difference=0.072; p-value=0.014).

The mean difference in the change of asset turnover is negative, which suggests that asset turnover is deteriorating for backdating firms (mean difference=-0.023; p-value=0.085). We do not find a significant difference for the level of asset turnover between backdating and non-backdating firms (mean difference=0.004; p-value=0.889). Nevertheless, it is helpful to examine the means of the *change* in asset turnover for both groups separately. The change in asset turnover of the backdating sample equals -0.028, which is significant at the 1 percent level. The matched firms, somewhat surprisingly, also exhibit on average negative changes in asset turnover but this is not significant.

In sum, the conclusions drawn from the financial statement analysis tests are much less ambiguous than those from the earlier analyses based on earnings attributes. Indeed, we find comprehensive evidence that the accounting quality of backdating firms is lower than the quality of firms that have not engaged in backdating. Our matched-sample tests enable us to discount potential competing explanations for differences in accounting quality that do not refer to personal characteristics of top management.

When we measure accounting quality using seven earnings attributes as described in Francis et al. (2004), we do not find consistent results regarding the influence of personal traits of managers. We suspect that managers compensate lower

quality on one attribute with higher quality on another and use this balancing strategy to direct away investors' scrutiny. Though the results from our diagnostic tests are much less ambiguous, we also find some evidence to support our conjecture. For example, most of our sample firms are in high-tech industry; spending on Research & Development might be a focus of attention of investors. Indeed, we find backdating firms, on average, spend more on Research & Development in percentage of their sales than their peers.

3.6 Discussion, limitations, and concluding comments

Our investigation of the reporting behavior of backdating firms is motivated by an increasing awareness in the literature that much of the between-firm variation in accounting quality cannot be explained by fundamental economic factors. We conjecture that personal traits of top management are a likely explanatory factor for discretionary reporting choices that remain unexplained by fundamentals. We find support for this conjecture in an emerging literature in the fields of economics, management, and finance as well as in a few recent accounting papers.

One thorny issue when exploring the role of managerial characteristics is that it is unclear which characteristics matter and how they can be captured empirically in a fashion that admits large sample testing. We propose to use the stock option backdating scandal as a setting in which a considerable number of managers have revealed themselves as being willing to commit fraud to buttress their own financial interests.

We hypothesize that these "dishonest" managers will have few qualms about misleading investors through their financial statements as they have already shown that they are willing to mislead authorities about their option plans. Thus, more specifically we argue that the accounting quality of backdating firms will be lower than the quality of non-backdating firms. We measure accounting quality using seven earnings attributes as described in Francis et al. (2004). Prior research shows that investors care more about accounting-based earnings attributes than market-based. Thus, it is more costly for managers to lower the quality of accounting-based than market-based attributes. We formalize this idea in our second hypothesis. Our findings show significant differences between the earnings attributes of backdating and non-backdating firms. In contrast to our expectations, however, backdating firms have *better* levels of predictability, persistence and conservatism. On the other hand,

these firms perform more poorly on accrual quality, smoothness, and timeliness. We find no significant differences on value relevance. While consistent with our overall idea that top management characteristics matter, these findings provide only partial support for the first hypothesis and are inconsistent with the second hypothesis.

The literature has pointed out that while these earnings attributes are generally construed as measures of accounting quality, they are at the same time partially overlapping and not necessarily internally consistent. One possible explanation for our mixed results therefore is that there is no straightforward interpretation of earnings attributes as a measure of accounting quality. We therefore propose to rely on a more traditional approach of evaluating accounting quality, i.e., to use financial statement analysis. Thus, we compute ratios that have been identified as quality diagnostics and compare the scores for backdating firms with their closest competitor. We show that backdating firms are more aggressively booking sales, have low expenditures relative to their sales activity, and (consequently) higher profit margin and lower asset turnover. Thus, the financial statement analysis yields the unambiguous judgment that the accounting quality of backdating firms is lower than that of their peers. Under our hypothesis, we ascribe this difference to the revealed type of the top management of backdating firms.

Our conclusions about the influence of managerial type are conditional on our ability to control for the fundamental economic determinants of reporting behavior. While we follow prior literature in our regression specifications and include many variables that have been identified in earlier work, we cannot exclude the possibility that we have omitted a significant fundamental factor. Similarly, in our financial statement analysis tests, our conclusions rely on the soundness of our matching procedure. We also concede that to some extent our choice of included ratios is arbitrary. We are limited by our intention to provide large sample evidence and data availability is an issue for many of the ratios that could potentially be used. We also must emphasize that our exercise is not by any means equivalent to a full-fledged fundamental analysis, if only because that would involve developing industry-specific ratios and examining these ratios over longer time spans.

Notwithstanding these issues, our study is among the first to provide evidence on how managerial characteristics affect accounting quality. We also show that while earnings attributes are commonly used indicators of accounting quality, their

interpretation is not obvious. We suggest that putting these attributes in the context of a traditional ratio-analysis might be helpful.

3.7 References

Barton, J., B. Hansen and G. Pownall (2007). What Performance Measure Attributes Do Investors Value the Most? Working paper, Emory University.

Barton, J. and P. J. Simko (2002). "The Balance Sheet as an Earnings Management Constraint." *The Accounting Review* 77(Supplement): 1-27.

Bernile, G., G. A. Jarrell and H. Mulcahey (2006). The Effect of the Options Backdating Scandal on the Stock-Price Performance of 110 Accused Companies, SSRN.

Bertrand, M. and A. Schoar (2003). "Managing with Style: The Effect of Managers of Firm Policies." *Quarterly Journal of Economics* CXVIII(4): 1169-1208.

Bizjak, J., M. L. Lemmon and R. J. Whitby (2007). Option Backdating and Board Interlocks, SSRN.

Booth, P. and A. K. D. Schulz (2004). "The Impact of an Ethical Environment on Managers' Project Evaluation Judgments under Agency Problem Conditions." *Accounting, Organizations and Society* 29(5-6): 473-488.

Bowen, R., S. Rajgopal and M. Venkatachalam (2008). "Accounting Discretion, Corporate Governance, and Firm Performance." *Contemporary Accounting Research*: forthcoming.

Cicero, D. C. (2007). Strategic Timing and Backdating of Executive Stock Option Exercises: Before and After the Sarbanes-Oxley Act, SSRN.

Dechow, P. M. and I. D. Dichev (2002). "The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors." *The Accounting Review* 77(Supplement): 35-60.

Dhaliwal, D. S., M. Erickson and S. Heitzman (2007). Taxes and the Backdating of Stock Option Exercise Dates, SSRN.

Easton, P. and J. Pae (2004). "Accounting Conservatism and the Relation Between Returns and Accounting Data." *Review of Accounting Studies* 9(4): 495-521.

Fama, E. F. and J. MacBeth (1973). "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy* 81(2): 607-636.

Fields, T. D., T. Z. Lys and L. Vincent (2001). "Empirical Research on Accounting Choice." *Journal of Accounting & Economics* 31(1-3): 255-307.

Fleischer, V. (2006). Options Backdating, Tax Shelters, and Corporate Culture, SSRN.

Forelle, C. and J. Bandler (6 May 2006). "Backdating Probe Widens as 2 Quit Silicon Valley Firm --- Power Integrations Officials Leave Amid Options Scandal; 10 Companies Involved So Far", The Wall Street Journal: A1.

Forelle, C. and J. Bandler (18 March 2006). "The Perfect Payday", The Wall Street Journal: A1.

Francis, J., A. H. Huang, S. Rajgopal and A. Y. Zhang (2008). "CEO Reputation and Reporting Quality." *Contemporary Accounting Research* 25(1): in press.

Francis, J., R. LaFond, P. M. Olsson and K. Schipper (2004). "Costs of Equity and Earnings Attributes." *The Accounting Review* 79(4): 967-1010.

Garcia Lara, J. M., B. Garcia Osma and F. Penalva (in press). "Accounting Conservatism and Corporate Governance." *Review of Accounting Studies.*

Gompers, P., J. Ishii and A. Metrick (2003). "Corporate Governance and Equity Prices." *Quarterly Journal of Economics* 118(1): 107-155.

Hambrick, D. C. and P. A. Mason (1984). "Upper Echelons: The Organization as a Reflection of Its Top Managers." *Academy of Management Review* IX(2): 193-206.

Harrell, A. and P. Harrison (1994). "An Incentive to Shirk, Privately Held Information, and Managers' Project Evaluation Decisions." *Accounting, Organizations and Society* 19(7): 569-577.

Heron, R. A. and E. Lie (2006). What Fraction of Stock Option Grants to Top Executives Have Been Backdated or Manipulated. Working Paper, Indiana University.

Jain, S. and Z. Rezaee (2007). Capital Market Reactions to Option Backdating Probes, SSRN.

Johnston, D. C. (10 August 2004). "Tech Company Settled Tax Case Without an Audit", The New York Times.

Lie, E. (2005). "On The Timing of CEO Stock Option Awards." *Management Science* 51(5): 802-812.

Malmendier, U. and G. A. Tate (2007). Superstar CEOs, SSRN.

Malmendier, U., G. A. Tate and J. Yan (2007). Corporate Financial Policies with Overconfident Managers. NBER Working Paper 13570.

Maremont, M. (11 November 2005). "Authorities Probe Improper Backdating of Options --- Practice Allows Executives To Bolster Their Stock Gains; A Highly Beneficial Pattern", The Wall Street Journal: A1.

Narayanan, M. P., C. A. Schipani and H. N. Seyhun (2006). The Economic Impact of Backdating of Executive Stock Options, SSRN.

Newey, W. K. and K. D. West (1987). "A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix." *Econometrica* 55(3): 703-708.

Penman, S. (2003). "The Quality of Financial Statements: Perspectives from the Recent Stock Market Bubble." *Accounting Horizons* 17: 77-96.

Penman, S. H. (2007). *Financial Statement Analysis and Security Valuation.* Boston [etc.], McGraw-Hill Irwin.

Richardson, S., A. I. Tuna and P. D. Wysocki (2003). Accounting for Taste: Board Member Preferences and Corporate Policy Choices. Working Paper, MIT Sloan School.

Rotemberg, J. J. and G. Saloner (2000). "Visionaries, Managers, and Strategic Direction." *RAND Journal of Economics* XXXI(4): 693-716.

Scherr, A. and M. C. Jensen (2006). A New Model of Leadership. Harvard NOM Research Paper No. 06-10. Boston.

Verdi, R. S. (2005). Information Environment and The Cost Of Equity Capital. Working Paper, Wharton School.

Walker, D. I. (2006). Some Observations on the Stock Option Backdating Scandal of 2006, SSRN.

3.8 Appendix 1 Definitions of variables

Part I: Variables used in empirical analysis of earnings attributes of backdating and non-backdating firms

- *Backdating*: This measure is an indicator variable which equals unity if the sample firm in a certain year has been identified as having backdated its stock options, zero otherwise.

- *AccrualQuality:* This measure follows the Dechow and Dichev (2002) model and defines accrual quality as the standard deviation of the residuals from a regression of current accruals on lagged, current, and lead cash flows from operations. The model is estimated for each firm using a rolling 6-year window. As discussed in Francis et al. (2004), the quality of accruals and earnings is decreasing in the magnitude of the estimation errors. Large (small) values of *AccrualsQuality* correspond to poor (good) accrual quality.

- *Persistence:* The persistence of earnings is measures the impact of current earnings on future earnings. *Persistence* is the negative of the slope coefficient of an auto-regressive model of order one for earnings-per-share. The model is estimated for each firm using a rolling 6-year window. Higher (low) values of *Persistence* represent less (more) persistent earnings.

- *Predictability:* This measure is the standard deviation of the residuals of an auto-regressive model of order one for earnings-per-share. The model is estimated for each firm using a rolling 6-year window. Large (small) values of *Predictability* correspond to less (more) predictable earnings.

- *Smoothness:* This measure is the standard deviation of net income before extraordinary items deflated by beginning total assets divided by the standard deviation of the ratio of cash flow from operations deflated by beginning total assets to control for difference in economic performance across firms. The standard deviation of earnings and cash flows is estimated for each firm using

a rolling 6-year window. Large (small) values of *Smoothness* correspond to less (more) smoothed earnings relative to cash flows.

- *Relevance:* This measure is computed as the negative of the explanatory power (i.e., R-square) of a regression of stock returns on levels and changes of earnings for each firm using a rolling 6-year window. Earnings is measured as net income before extraordinary items deflated by beginning market value of equity. Large (small) values of *Relevance* correspond to less (more) value relevant earnings.

- *Timeliness:* This measure is the negative of the adjusted R2 from a reverse regression of annual earnings before extraordinary items on 15-month returns for each firm using a rolling 6-year window (with separate intercept and slopes for negative and positive return). Large (small) values of *Timeliness* correspond to less (more) timely earnings.

- *Conservatism:* This measure is the negative of the ratio of the coefficient of bad news to the coefficient of good news in the reverse regression used for measuring *Timeliness*. Large (small) values of *Conservatism* correspond to less (more) conservative earnings.

- *Size:* This measure is defined as the natural logarithm of total assets.

- *σ(CFO):* This variable is calculated as the standard deviation of the firm's rolling 6-year cash flow from operations, scaled by total assets.

- *σ(sales):* This variable is computed as the the standard deviation of the firms rolling 6-year sales revenues, scaled by total assets.

- *OperCycle:* This variable is defined as the natural logarithm of the sum of the firms' days accounts receivable and days inventory. A firm's days accounts receivable is measured as 365 days divided by accounts receivable turnover, where accounts receivable turnover is measured as the sales revenues divided

by average accounts receivables. A firm's days inventory is measured as 365 days divided by inventory turnover, where inventory turnover is calculated as the cost of goods sold divided by average inventory.

- *NegEarn:* This variable is defined as the firm's proportion of losses over the prior six years.

- *Int_Intensity:* This variable is defined as the sum of the firm's reported research and development (R&D) and advertising expense as a proportion to its sales revenues. Missing values of R&D and advertising expense are set to zero.

- *Int_Dummy:* This variable is an indicator variable which equals one if the firm does not have reported intangibles (i.e., if *Int_Intensity* equals 0), and zero otherwise.

- *Cap_Intensity:* This variable is defined as the ratio of the net book value of property, plant, and equipment to total assets.

- *Indus_Dummy:* This is an indicator variable which equals one if the sample firm belongs to a certain 2 digit industry, zero otherwise.

- *G-index:* Corporate governance score provided by Andrew Metrick and calculated as described in Gompers et al. (2003).

Part II: Variables used in ratio analysis for matched samples of backdating and non-backdating firms

- *Size:* This variable is defined as the difference of the natural logarithm of assets between backdating and non-backdating firms. Backdating firms are the sample firms identified as having their stock options backdated in a certain year. Non-backdating firms are the matched pair for backdating firms based on four digit industry code, size (natural logarithm of assets) and time (year).

- *REVENUE/CASH:* This variable is defined as the *negative* of the difference of sales to cash flow from operation between backdating and non-backdating firms. Holding the level of cash flows constant, higher revenues are more likely the outcome of aggressively recognizing sales. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *REVENUE/REC:* This variable is defined as the difference of sales revenue to accounts receivables between backdating and non-backdating firms. If firms adopt more aggressive credit sale policy and underestimate returns and credit losses, the ratio of revenue to receivables will decrease. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *ΔREVENUE/ΔREC:* This variable is defined as the difference of the change of sales to the change of receivables between backdating and non-backdating firms. If the change in sales is lower than the change in credit sales, it is likely that firms adopt more aggressive credit sale policy and underestimate returns and credit losses. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *NONINCOM:* The variable is defined as the *negative* of the difference of non-operating income between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *SGA/REVENUE:* The variable is defined as the difference of selling, general and administrative expense (SGA) to sales between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *PENSION/SG:* The variable is defined as the difference of pension expense to selling, general and administrative expense (SGA) between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *CGS/REVENUE:* The variable is defined as the difference of cost of goods sold (CGS) to sales between backdating and non-backdating firms. CGS can be manipulated via inventories. For example, firms fail to write down obsolete inventories Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality..

- *DA/REVENUE:* This variable is defined as the difference of depreciation and amortization expense (DA) to sales between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *RD/REVENUE:* This variable is defined as the difference of research and development expense (R&D) to sales between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *BADDEBT/REC:* This variable is defined as the difference of bad debt allowance to accounts receivables between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- Δ*BADDEBT/*Δ*REC:* This variable is defined as the difference of the change of bad debt allowance to the change of accounts receivables between backdating and non-backdating firms. Negative (positive) values indicate that (non-backdating) backdating firms have lower accounting quality.

- *PM:* This variable is defined as the difference of profit margin between backdating and non-backdating firms, where profit margin is defined as net

income divided by net sales revenues. Positive (negative) values of *PM* indicate that backdating firms have lower (higher) accounting quality.

- *ATO* is defined as the difference of asset turnover between backdating and non-backdating firms, where *asset turnover* is defined as the sales revenue divided by net operating assets. Negative (positive) values of *ATO* indicate that backdating firms have lower (higher) accounting quality.

- *ΔPM:* This variable is defined as the difference of the change of the profit margin between backdating and non-backdating firms. Positive (negative) values of *ΔPM* indicate that backdating firms have lower (higher) accounting quality.

- *ΔATO:* This variable is defined as the difference of the change in *ATO* between backdating and non-backdating firms. Negative (positive) *ΔATO* indicate that backdating firms have lower accounting quality.

- *ATO_SAMPLE and ATO_MATCHED: ATO_SAMPLE* is defined as the change of asset turnover of backdating firms. *ATO_MATCHED* is defined as the change of asset turnover of non-backdating firms. Negative changes indicate the effect of upward (downward) earnings manipulation.

3.9 Appendix 2 Firms involved in the stock option backdating scandal

Company name	Start year	End year
Activision Inc.	1993	2006
Affiliated Computer Services -Cl A	1994	2005
Affymetrix Inc.	1997	1999
Agile Software	1999	2003
American Tower Corp.	2005	2006
Amkor Technology Inc.	1998	2005
Analog Devices	1998	2001
Apollo Group Inc. -Cl A	1994	2005
Apple Computer Inc.	1997	2002
Applied Micro Circuits Corp	1998	2002
Applied Signal Technology	1998	2005
Aspen Technolog	1996	2004
Atmel Corp.	1993	2004
Autodesk Inc.	1998	2006
Barnes & Noble Inc.	1996	2006
Bea Systems	1997	2006
Bed, Bath & Beyond	1998	2004
Biomet	1996	2006
Black Box	1995	2002
Blue Coat Systems Inc.	2000	2004
Boston Communications Group	1998	2002
Broadcom Corp. -Cl A	1998	2003
Brocade Communications Systems	2000	2004
Brooks Automation Inc.	1996	2005
Ca Inc.	1996	2006
Cablevision Sys Corp. -Cl A	1997	2002
Caremark Rx Inc.	1994	2005
Cec Entertainment Inc.	1989	2005
Ceradyne Inc.	1997	2003
Cheesecake Factory Inc.	2000	2006
Children's Place	2003	2005
Cirrus Logic Inc.	1997	2005
Clorox Co/De	1996	2006
Cnet Networks Inc.	2003	2005
Computer Sciences Corp.		
Comverse Technology Inc.	1991	2002
Corinthian Colleges Inc.		

Costco Wholesale	2005	2006
Crown Castle Intl Corp.	1998	2001
Cyberonics Inc.	1999	2003
Delta Petroleum	1997	2004
Dot Hill Systems Corp.	2000	2003
Electronic Arts	1997	2006
Emcore	2000	2003
Endocare Inc.	1997	2002
Engineered Support Systems	2000	2006
Eplus Inc.	1997	2006
Extreme Networks Inc.		
F5 Networks Inc.	1995	2006
Forrester Research	1998	2004
Foundry Networks Inc.	1995	2006
Getty Images	1999	2002
Hansen Natural		
Hcc Insurance Holdings	1995	2006
Healthsouth Corp.	1995	2002
Home Depot Inc.	1981	2001
Ibasis	1999	2006
Insight Enterprises	1996	2006
Integrated Silicon Solution	1995	2006
J2 Global Communications Inc.		
Jabil Circuit Inc.	1998	2001
Juniper Networks Inc.	2003	2006
Kb Home	1998	2005
Keithley		
King Pharmaceuticals	2000	2001
Kla-Tencor Corp.	1991	2005
Kos Pharmaceuticals Inc.	2001	2003
L-3 Communications Hldgs Inc.	1998	2006
Marvell Technology Group Ltd.	2000	2006
Maxim Integrated Products		
Mcafee Inc.	2000	2002
Meade Instruments Corp.	1998	2002
Medarex Inc.	2000	2006
Mercury Interactive Corp.	1996	2002
Michaels Stores Inc.	1990	2001
Microsoft Corp.	1992	1999
Microtune	2000	2003

Mips Technologies		
Molex Inc.	1994	2006
Monster Worldwide Inc.	1997	2001
Msystems	2001	2005
Newpark Resources	2001	2003
Novell Inc.	1996	2005
Novellus Systems Inc.	1997	2002
Nvidia Corp.	2000	2006
Nyfix Inc.	2000	2006
Openwave Systems Inc.	1995	2006
Pediatrix	1995	2001
Pixar	1997	2001
Pmc-Sierra Inc.	1998	2001
Power Integrations Inc.	1999	2004
Progress Software Corp.	1995	2002
Quest Software Inc.	2000	2005
Rambus Inc.	1990	2005
Redback Networks Inc.		
Renal Care Group Inc.	1997	2002
Research In Motion	1997	2002
Restoration Hardware Inc.	2002	2004
Rsa Security Inc.	1999	2005
Safenet Inc.	2000	2006
Sanmina-Sci Corp.	1997	2006
Sapient	1997	2001
Semtech Corp.	2002	2006
Sepracor Inc.	2003	2006
Sharper Image	2003	2005
Sigma Designs Inc.	1994	2005
Silicon Image	2000	2005
Sonus Networks	2000	2003
Stolt-Nielsen	2003	2004
Sunrise Telecom	2001	2005
Sun-Times Media	1999	2002
Sycamore Networks Inc.	2000	2005
Take-Two Interactive Software	1997	2003
Thq Inc.	1996	2005
Trident Microsystems Inc.	1995	2004
Ulticom Inc.	2002	2005
Unitedhealth Group Inc.	1999	2002

Valeant Pharmaceuticals	1997	2006
Verint Systems Inc.	1991	2002
Verisign Inc.	2001	2005
Vitesse Semiconductor Corp.	1995	2006
Western Digital Corp.	1999	2003
Wind River		
Witness Systems Inc.	2000	2002
Zoran Corp.	1997	2005
Flir Systems	1996	2001
Altera Corp.	1996	2000
Asyst Technologies Inc.	1997	2006
Gap Inc.		

Chapter 4: To Miss or To Meet Earnings Benchmarks? Earnings Management of Firms Involved in Stock Option Backdating*

4.1 Introduction

Prior literature provides evidence that managers have incentives to *meet* or *beat* earnings benchmarks and are rewarded by markets for doing so (Lopez and Rees 2002; Skinner and Sloan 2002). One of the reasons managers do this is that their compensation is tied to the stock price and they try to avoid the negative price consequence of missing earnings targets. Managers also have incentives to *miss* their earnings targets for the benefit of obtaining a lower strike price on subsequent option grants (McAnally et al. 2008).

I examine whether meeting/beating or missing earnings benchmarks is more pronounced for firms with managers involved in the option backdating scandal. Consistent with prior literature, I examine three earnings benchmarks: 1. report positive profits, 2. sustain recent performance, and 3. meet analysts' expectations. Options backdating is the practice of granting employee stock options (ESO) that are dated *prior* to the date that the company *actually* granted the option. It is illegal in the sense that the grantor submitted falsified documents to investors and regulators in an effort to conceal the backdating. ESOs are usually granted at-the-money, i.e., the exercise price of the options is set to equal the market price of the underlying stock on the grant date. Because the option value is higher if the exercise price is lower, executives prefer to be granted options when the stock price is at its lowest. Backdating allows executives to choose a past date when the market price was particularly low, thus inflating the value of the options. By the summer of 2007, the Securities and Exchange Commission as well as state and federal prosecutors had launched several investigations into possible improper backdating of options and more than 130 listed companies are suspected of engaging in this practice.

Controlling for operational reasons, both just meeting/beating and just missing earnings benchmarks can be consistent with earnings management and may entail

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negative consequences to other stakeholders. For example, some managers are willing to engage in value-destroying actions in order to meet/beat earnings benchmarks (Graham et al. 2005). In addition, managers who want to get a lower strike price of their option grant, miss earnings targets on purpose (McAnally et al. 2008), which may harm the current stock holders via increased perceived risk or increased cost of capital. Managers who illegally backdated their stock option grants reveal by doing so that they are willing to mislead shareholders, tax authorities, and other stakeholders to the firm to obtain personal gains. I expect managers who illegally backdated their option grants are less concerned about negative consequences to other stakeholders in the company and are more likely to manage their earnings in order to meet/beat or miss earnings targets if they can gain personal benefits through such behavior. I interpret the difference in meeting/beating earnings benchmark behavior between backdating and non-backdating firms as evidence for my prediction that a manager's type plays a significant role in earnings management.

Durtschi and Easton (2005; 2008) argue that the interpretation of benchmark beating or missing can be problematic as the empirical measures rely on scaling by stock price. This scaling procedure itself could be responsible for the finding in the extant literature that *more* firms just meet/beat earnings benchmarks compared to firms just missing earnings benchmarks. For instance, beginning of year prices for small loss firms are systematically lower than the corresponding figures for small profit firms. Consequently, small positive earnings are scaled closer to zero by higher beginning of year price; small negative earnings are scaled away from zero by lower beginning of year prices. The results from this paper help to shed light on the debate on the validity of its use as measure of earnings management for the following two reasons. First, in the current setting, we have strong priors that backdating managers are prone to manage earnings. Given these priors, finding meeting/beating behavior with these managers is easier to accept as earnings management. Second, I am not examining whether firms in general are more likely to have their earnings distributed above the earnings benchmarks, but I try to examine whether backdating firms are more likely to have their earnings distributed above the earnings benchmarks compared to non-backdating firms. This comparison may suffer less from the scaling problem as I am not comparing firms with small profits to firms with small losses.

Using a sample of 63 identified backdating firms with financial information to conduct the tests (348 firm-year observations) and 1950 non-backdating firms (14,519

firm-year observations), I find that backdating firms are more likely to meet or narrowly beat all three earnings benchmarks examined in the paper. At the same time, they are less likely to miss analysts' forecasts. The evidence is consistent with the observations that managers try to meet stakeholders' expectations and try to avoid costly litigation that could potentially be triggered by unfavorable earnings surprises (Bartov et al. 2002).

My paper contributes to the literature in the following ways. First, the findings add to the earnings management literature. The results show that, not only incentives matter regarding earnings management in terms of meeting/beating behavior, but also a manager's type plays a role. Managers who have been involved in backdating practices and so reveal their willingness to harm other stakeholders also are more prone to engage in earnings management. Second, my paper adds to the ongoing discussion whether earnings management is responsible for the documented pattern of benchmark-beating reporting behavior or whether this is due to issues of scaling: managers who are more likely to manage their earnings also more often show "suspect" benchmark missing/beating behavior. Third, the findings indirectly add to the current discussion on stock option backdating; I conclude that attention should not only be paid to the economic consequences of the stock option scandal itself, but attention should also be given to possible earnings management by these managers.

4.2 Hypothesis development

4.2.1 Meeting/beating earnings benchmarks

Prior researchers (Burgstahler and Dichev 1997; Degeorge et al. 1999) suggest that firms' stakeholders, such as investors, directors, customers, and suppliers use earnings benchmarks as reference points or heuristics to evaluate the performance of firms and they find that firms have strong incentive to manage their earnings to beat three earnings benchmarks: positive earnings, last year's earnings, and analyst forecasts. Consistent with his conjecture that firms have increased their propensity to report both profits and losses that either meet or beat analyst estimates due to the heightened concern of managers with litigation, Brown (2001) finds a growing number of firms meeting/beating earnings benchmarks. Brown and Caylor (2005) find that firms earn abnormal positive returns when they report profits, quarterly earnings increases, or beat analyst forecasts. Daske, Gebhardt and Mcleay (2006) find that

meeting/beating earnings benchmarks in the EU is even more pronounced than in the US.

Previous researchers also find that markets react negatively when firms miss zero earnings targets, or analyst forecasts and firms manage their earnings to meet or beat these earnings benchmarks (Lopez and Rees 2002; Skinner and Sloan 2002). Graham, Harvey and Rajgopal (2005), in a survey, show that managers are willing to take value-destroying actions to meet and beat analyst's earnings per share (EPS) targets. With capital markets sensitive to earnings benchmarks which drive the short-term stock price movement, managers may manipulate earnings to achieve their earnings targets in order to obtain the desired price movement (e.g., Dhaliwal, Gleason, and Mills 2004; Graham et al. 2005; McAnally et al. 2008).

Managers who were involved in backdating scandal reveal themselves as willing to mislead stakeholders to the firm to obtain some personal benefits. For example, by backdating, these managers inflate the value of options and thus increase their compensation at the expense of the shareholders. According to previous literature, meeting/beating earnings benchmarks can bring managers higher bonuses, higher equity compensation, and labor-market reputation through increased stock prices. Managers may manipulate their earnings, at a cost to other stakeholders of the company, to obtain these benefits. I expect managers who illegally backdated their option grants are less concerned about the negative consequences to other stakeholders in the company and these managers are therefore more likely to manipulate their earnings.

H1: Just meeting or beating earnings benchmarks is more pronounced for firms involved in option backdating.

4.2.2 Missing earnings benchmarks

Prior studies find that managers either opportunistically time bad news or manage earnings downward prior to stock option grants (Aboody and Kasznik 2000; Chauvin and Shenoy 2001; Baker et al. 2003). Furthermore, Degeorge et al. (1999) argue that stakeholders to the company can more easily detect a missed earnings target than general earnings management. The stock price reaction is likely to be stronger for a missed earnings target than for downward earnings management by other means which does not lead to missing the earnings target (Skinner and Sloan 2002). Managers believe that missing an earning target is very costly in terms of stock

price decline (Graham et al. 2005). Empirical studies support managers' believes that the market reacts very negatively to firms that miss zero earnings targets or analysts' forecasts (Lopez and Rees 2002; Skinner and Sloan 2002). While missing earnings targets is costly to shareholders, a missed earnings target could directly benefit managers who are awarded stock-option grants after announcing earnings that are below target (McAnally et al. 2008). If managers in general have incentives to miss earnings target in order to create bad news and enjoy the benefit from subsequent lower stock option grant prices, managers with backdated options certainly can be expected to do so. I expect to find more pronounced missing target behavior among managers with backdated options based on the assumption that backdating managers have less concern over the negative consequence of their behavior.

H2: Missing earnings benchmarks is more pronounced for firms involved in option backdating.

4.2.3 Mixed strategy of meeting or missing earnings benchmarks

Prior research shows that whether and how to manage earnings is a strategic choice of managers based on the expected costs and benefits of such choices (Fields et al. 2001). Managers manage to meet or beat earnings benchmarks when they want to exercise their stock options, have earnings related bonus or other price-related incentives; these managers also have incentives to miss earnings benchmarks if they want to create bad news in order to get lower strike prices. Although missing an earnings target can be a rational executive decision, managers do not seem to adopt a strategy of consistently missing earnings benchmarks (McAnally et al. 2008). Instead, managers use mixed strategies according to their needs. Depending on the tradeoff of meeting/beating or missing the earnings targets, managers have incentives to choose either of the two kinds of strategies. Both meeting/beating and missing earnings benchmarks can be an indicator of earnings management which may bring benefits to the managers and impose costs on the firm or on shareholders. I expect to find both forms of earnings management more pronounced for managers with backdated options based on the assumption that managers use a mixed strategy of doing both. In other words, I expect to find a disproportionate higher number of backdating firms that just meet/beat or just miss earnings benchmarks.

4.3 Research design and sample selection

4.3.1 Research design

Following prior research (Burgstahler and Dichev 1997; Degeorge et al. 1999; Brown 2001; Dichev and Skinner 2002; Brown and Caylor 2005; Bartov and Cohen 2007; McAnally et al. 2008), I use the following three proxies for earnings benchmarks: positive earnings, last year's earnings, and analyst forecasts. Just meeting/beating earnings are defined as indicator variables which equal one, if (1) earnings divided by lagged market value is equal to or larger than 0.00 but less than 0.02 (JMBT1); (2) change in earnings scaled by lagged market value is equal to or larger than 0.00 but less than 0.02 (JMBT2); and (3) earnings per share beat or meet the most recent analyst forecast by less than two cents (JMBT3), and zero otherwise. Extant research suggests that losses have the biggest impact on stock price when the loss is very small (i.e., when the firm just misses reporting positive earnings) or when the loss is very large (i.e., when the firms reports a "big bath") (Healy 1985; McAnally et al. 2008). Both forms of missing targets behavior are taken as earnings management, following McAnally et al., I label missing earnings targets as either when firms just miss earnings targets to a very small extent or when firms miss the targets to the maximum extent. Consistent with the just meeting/beating earnings benchmarks, the just missing earnings benchmarks are also defined as indicator variables which equal one, if (1) earnings divided by lagged market value is either less than 0.00 but greater than -0.02 or is less than 0.00 and in the lowest quartile for that 2-digit industry for that year (JMST1); (2) change in earnings divided by lagged market value is either less than 0.00 but greater than -0.02 or is in the lowest quartile for that 2-digit industry for that year (JMST2); (3) a firm's earnings per share either miss the most recent analyst forecast by less than two cents or is in the lowest quartile for that industry for that year (JMST3) (Burgstahler and Dichev 1997; Phillips, Pincus, and Rego 2003; McAnally et al. 2008), and zero otherwise.

I use the following model to test if just meet/beat or miss earnings benchmarks are more pronounced for backdating firms:

$$\Pr ob(Just\ meet(beat)/miss\ benchmarks_{i,t} \in \Phi_k) = logit(\lambda_{0,k} + \lambda_{1,k} Backdating_{i,t} + \lambda_{2,k} SOXpost_{i,t} + \lambda_{3,k} Grantafter_{i,t} + \lambda_{4,k} Grantv_{i,t} + \lambda_{5,k} Exercise_{i,t} + \lambda_{6,k} Options_{i,t} + \lambda_{7,k} Bonus_{i,t} + \lambda_{8,k} Stock_{i,t} + \lambda_{9,k} Size_{i,t} + \lambda_{10,k} MB_{i,t} + \lambda_{11,k} Leverage_{i,t} + \lambda_{12,k} ROA_{i,t} + \varepsilon_{i,t}) \quad (1)$$

Where Meeting/missing benchmarks are two set of choices made by managers; Φ could be one of the following three earnings benchmarks: (1) positive earnings (2) last year's earnings; and (3) analyst forecasts. *Backdating* is an indicator variable which equals one if the sample firm in a certain year is identified as having its stock options backdated, and zero otherwise. The definitions of all variables are provided in Appendix 1.

The logic behind this test is that, under the null hypothesis, the cross-sectional distribution of just meeting/missing earnings benchmarks should be the same for backdating and non-backdating firms. If the frequency of backdating firms meeting/missing earnings benchmarks is significantly higher, then there is evidence that backdating firms are engaged in earnings management to a greater extent.

Since all dependent variables are measured in a binary form, logistic regressions are used to estimate the probability that a firm meets/beats or misses earnings benchmarks. A positive (negative) regression coefficient of an independent variable means that this factor (independent variable) increases (decreases) the probabilities of a firm to meet/beat or to miss earnings benchmarks. To address potential time-series and cross-sectional dependence, standard errors are clustered at both the firm and year level (Petersen 2008).

To test the hypotheses, I estimate six equations using *JMBT1, JMBT2*, *JMBT3, JMST1, JMST2*, and *JMST3* as dependent variables; the backdating indicator variable is the explanatory variable of interest. If meeting/beating or missing earnings benchmarks is more pronounced for firms involved in option backdating scandal, I expect the coefficient on *Backdating* to be positive.

Control variables

Control variables are based on earlier work and include proxies for executive compensation incentives, firm characteristics, and the regulation environment.

Prior research finds that performance-based compensation creates incentives for managers to choose different reporting strategies: managers with high equity incentives (option grants, un-exercisable options, exercisable options, restricted stock grants and stock ownership) are more likely to manage earnings upward (Baker et al. 2003; Bartov and Mohanram 2004; McVay, Nagar, and Tang 2006; Meek, Rao, and Skousen 2007) and to meet or beat earnings benchmarks (Cheng and Warfield 2005); managers with bonus pay can have incentives to manage earnings upward or manage earnings downward when managers expect to miss their bonus by large amounts

(Healy 1985). I expect a negative association between missed earnings targets and these CEO compensation incentives. I have no signed prediction for the coefficients on these CEO compensation incentives in just meet/beat equations. Managers have incentives to manage earnings upward to the maximum extent in order to maximize his bonus payoff or equity-based compensation instead of to just beat or meet earnings benchmarks. If this is true, the association between incentive compensation and meeting/beating earnings benchmarks can be positive for just meeting/beating firms and negative for firms meeting/beating earnings benchmarks to a larger extent. McAnally et al. (2008) show that managers also have incentives to miss their earnings targets for the benefit of lower strike price on subsequent option grants. I included in the regression a dummy variable which equals one if there are subsequent option grants three months after the earnings announcement, and zero otherwise. To control for the influence of the size of the option grant, I also include the option grant value in the regression.

I control for other firm level characteristics which influence managerial reporting behavior. Leverage is included for the reason that managers have incentives to manage earnings to avoid debt-covenant violation (DeFond and Jiambalvo 1994) and because beating earnings benchmarks lowers the cost of debt (Jiang 2008). Size, measured as the natural logarithm of assets, firm performance, measured as return on asset, and growth options, measured as market to book ratio, are included to allow for operational causes of differences in meeting/beating targets. In the analyst forecast benchmark equation, both forecast error and analyst following are included as extra control variables since both are found to be correlated with forecast bias in the sense that analysts might issue optimistic forecasts to gain increased access to information from management and a greater analyst following can lead to more intense competition among analysts to issue more optimistic forecasts (Bhushan 1989; Bartov et al. 2002). Forecast error is measured as the difference of actual earnings per share and the first analyst's forecast. Number of analyst following is measured as the average number of analyst following the company through the sample year.

Finally, I also control for the change of the regulation environment which may influence managers' reporting behavior. Bartov and Cohen (2007) and Cohen et al. (2008) argue that the passage of the Sarbanes-Oxley Act (SOX) in 2002 changed the financial reporting environment significantly, in particular with respect to auditor independence and rules on internal controls for financial reporting. These measures

potentially limit earnings management and they find evidence that there is less accrual-based earnings management but more real earnings management after the SOX. Since the net effect of less accrual-based earnings management and more real earnings management is unknown, I do not have a signed prediction on the effect of the passage of SOX on managers' meeting/beating or missing reporting behavior.

4.3.2 Sample selection

I use a list of companies that have disclosed government probes, misdated options, restatements, and/or executive departures provided by The Wall Street Journal Online as the source for firms that are under scrutiny for possible option backdating. The sample time period is from 1992 to 2006.[33] I verify when the company is suspected to have its first backdated options as well the time period over which backdating (allegedly) occurred (see Appendix 2 for the full list of companies which are involved in the backdating). To be included in the final sample, I require firms to have available financial data, compensation data, and analyst forecast data and to survive the outlier deletion process.

I use the I/B/E/S detail history file to get the earnings forecasts and actual earnings numbers unadjusted for stock splits.[34] All compensation data are from Execucomp. I compute all other firm level variables using data from the Compustat and CRSP. Consistent with prior research, observations from public utility and financial service industries are excluded (two-digit SIC codes 49 and 60-69). To mitigate the influence of extreme observations, I delete all continuous variables at the top and bottom one percent. The main analysis is based on the sample of 14,867 firm-year observations which consists of 63 backdating firms (348 firm-year observations) and 1,950 non-backdating firms (14519 firm-year observations). Table 1 presents the year-by-year distribution of backdating and non-backdating firms included in the final sample for the main tests.

[33] All compensation data for CEOs which are required for my analysis are available from 1992. The first recorded backdating is in 1981. WSJ online reports backdating for 6 firms (21 firm-year observations) before 1992.

[34] To address the concern that the estimates and actual values may be based on different numbers of shares outstanding due to stock split, I follow the methodology by Robinson and Glushkov (2006), using the split date provided by financial analysts, to merge the unadjusted data with the adjusted data, and then backing out the split factor to make sure that the estimates and actual values are based on the same number of shares.

4.4 Empirical findings

4.4.1 Descriptive statistics

Panel A, Table 2 presents the descriptive statistics of the just meeting/beating or missing earnings benchmark measures, CEO compensation, and other firm-level characteristics for non-backdating and backdating sample firms, respectively. Panel B presents the results of t-tests of the mean and Wilcoxon signed rank tests of the median for the same set of variables between the two groups of sample firms.

Table 1
Sample Composition

This table presents the year-by-year distribution of backdating and non-backdating firms included in the final sample for the main tests. Final sample excludes all firms in utility and financial industry. Firms included in the final sample need to have accounting data, compensation data in Compustat and analyst forecast data in IBES. Furthermore, to control for outliers, the top and bottom 1 percent of observations for all continuous variables are deleted. The sample period is from 1992 to 2006. The final sample consists of 63 backdating firms and 1950 non-backdating firms.

Year	# Non-backdating firms	# Backdating firms	Total
1992	240	0	240
1993	652	3	655
1994	972	7	979
1995	1084	9	1093
1996	1111	16	1127
1997	1086	26	1112
1998	1105	33	1138
1999	1127	38	1165
2000	1007	38	1045
2001	1009	44	1053
2002	1036	36	1072
2003	1091	34	1125
2004	1100	37	1137
2005	1070	27	1097
2006	829	0	829
Total	14519	348	14867

Compared to the non-backdating firm sample, the average percentage of firms which just meet/beat all the three earnings benchmarks is significantly higher for backdating firms at the 5 percent level or better (mean percentages 0.158 vs. 0.116, 0.216 vs. 0.172, 0.454 vs. 0.326). There is no consistent difference between

Table 2
Descriptive Statistics on just Meeting/Beating or Missing Earning Benchmark Measures, CEO Compensation and Other Firm Level Characteristics of Backdating and Non-backdating Firms

Panel A presents the distribution of six meeting and missing earnings benchmark measures, scaled CEO compensation and other firm-level characteristics (refer to Appendix 1 for variable definitions) for non-backdating and backdating firms. The columns present summary statistics calculated across all available firm-years.

Panel B presents the results of t-tests of the mean and Wilcoxon signed rank tests of the median for the same set of variables between non-backdating and backdating firms. Statistics for t-test is based on the assumption that variance of the variables is the same across non-backdating and backdating firms. Reported p-values are highlighted by using bold and italics when significant (p-value<10 percent), All p-values are from two-tailed tests.

Panel A: Descriptive statistics for non-backdating and backdating firms																	**Panel B: Mean and median test**			
Non-backdating firms									**Backdating firms**								**T-test (Mean)**		**Wilcoxon test (Median)**	
Varname	Mean	Std	P10	P25	Median	P75	P90	N	Mean	Std	P10	P25	Median	P75	P90	N	T-value	Probt	Z-value	Probt
JMBT1	0.116	0.320	0.000	0.000	0.000	0.000	1.000	14519	0.158	0.365	0.000	0.000	0.000	0.000	1.000	348	-2.399	***0.016***	-2.399	***0.016***
JMBT2	0.172	0.377	0.000	0.000	0.000	0.000	1.000	14519	0.216	0.412	0.000	0.000	0.000	0.000	1.000	348	-2.133	***0.033***	-2.133	***0.033***
JMBT3	0.326	0.469	0.000	0.000	0.000	1.000	1.000	14519	0.454	0.499	0.000	0.000	0.000	1.000	1.000	348	-5.019	***0.000***	-5.015	***0.000***
JMST1	0.253	0.435	0.000	0.000	0.000	1.000	1.000	14519	0.247	0.432	0.000	0.000	0.000	0.000	1.000	348	0.234	0.815	0.234	0.815
JMST2	0.412	0.492	0.000	0.000	0.000	1.000	1.000	14519	0.448	0.498	0.000	0.000	0.000	1.000	1.000	348	-1.340	0.180	-1.340	0.180
JMST3	0.285	0.451	0.000	0.000	0.000	1.000	1.000	14519	0.193	0.395	0.000	0.000	0.000	0.000	1.000	348	3.777	***0.000***	3.775	***0.000***
SOXpost	0.342	0.474	0.000	0.000	0.000	1.000	1.000	14519	0.353	0.479	0.000	0.000	0.000	1.000	1.000	348	-0.460	0.646	-0.460	0.646
Grantafter	0.265	0.441	0.000	0.000	0.000	1.000	1.000	14519	0.244	0.430	0.000	0.000	0.000	0.000	1.000	348	0.871	0.384	0.871	0.384
Grantv	2.628	4.626	0.000	0.000	1.126	3.008	6.628	13861	5.484	6.701	0.000	0.000	3.681	8.237	13.306	347	-11.211	***0.000***	-5.815	***0.000***
Exercise	1.926	5.321	0.000	0.000	0.000	1.007	5.653	14433	4.428	8.883	0.000	0.000	0.000	5.369	15.738	348	-8.491	***0.000***	-1.294	0.196
Options	13.013	25.794	0.000	0.577	4.169	13.680	33.691	14433	33.007	46.034	0.000	1.217	16.203	42.055	92.040	348	-13.936	***0.000***	-6.294	***0.000***
Bonus	0.812	0.826	0.000	0.167	0.661	1.144	1.783	14437	0.892	1.036	0.000	0.029	0.664	1.174	2.084	348	-1.777	***0.076***	-0.218	0.827
Stock	1.888	10.439	0.000	0.000	0.000	0.000	0.000	14429	0.650	7.897	0.000	0.000	0.000	0.000	0.000	348	2.197	***0.028***	3.797	***0.000***
Size	7.162	1.431	5.397	6.106	7.010	8.084	9.250	14513	7.015	1.201	5.422	6.181	7.018	7.798	8.662	348	1.894	***0.058***	-0.001	0.999
MB	3.133	2.615	1.115	1.619	2.420	3.732	5.855	14500	4.208	3.041	1.558	2.255	3.332	5.130	8.357	348	-7.552	***0.000***	-7.811	***0.000***
Leverage	0.217	0.160	0.000	0.077	0.212	0.328	0.430	14468	0.138	0.147	0.000	0.001	0.084	0.259	0.350	340	9.021	***0.000***	6.364	***0.000***
ROA	0.047	0.080	-0.024	0.021	0.053	0.088	0.126	14511	0.050	0.111	-0.055	0.028	0.072	0.111	0.144	348	-0.774	0.439	-4.558	***0.000***

backdating and non-backdating firms regarding missing earnings benchmark measures. If anything, compared to non-backdating firms, backdating firms are on average less likely to just miss analyst forecasts (mean percentage 0.193 vs. 0.285, p<0.001). The two groups do not differ in just missing positive earnings and last year earnings. Although backdating firms are slightly larger than non-backdating firms (mean size 7.162 vs. 7.015, p=0.058), they do not differ with regard to their profitability (mean ROA 0.050 vs. 0.047, p=0.439). Backdating firms have higher market to book ratio (*MB*) (mean value 4.028 vs. 3.133, p<0.001) but lower leverage (*Leverage*) compared to non-backdating firms (mean value 0.138 vs. 0.217, p<0.001).

On average, backdating firms do not differ much with respect to granting their managers options within three months after earnings announcement (mean percentage equals 0.244 and 0.265, p=0.384). But overall, the compensation structure of managers from the two samples appears to be different. Note that all compensation variables are scaled by the manager's fixed salary. Managers of backdating firms are granted more options (5.484 vs. 2.628, p<0.001) and hold more options (33.007 vs. 13.013, p<0.001) compared with their peers from the non-backdating sample. Another noticeable difference is the use of stocks in their compensation package. The managers of backdating firms, on average, receive fewer stocks than the managers of non-backdating firms (0.650 vs. 1.888, p=0.028). Managers of backdating firms receive more bonus pay (mean value 0.892 vs. 0.812, p=0.076). To further illustrate the difference in compensation structure of CEOs of backdating and non-backdating firms, I also report (un-scaled) dollar compensation for these two groups (descriptive statistics are not tabulated). On average, backdating managers receive higher total compensation ($4642.58 vs. $3537.38 in thousands), receive more options ($3110.06 vs. $1652.14 in thousands), hold more options ($18797.22 vs. $8260.79 in thousands), exercise more options in the year ($2570.89 vs. $1209.06 in thousands), receive less salary ($543.76 vs. $608.74 in thousands), have lower bonuses ($517.44 vs. $547.09 in thousands) and hold fewer shares ($844.95 vs. $1335.51 in thousands).

Table 3 presents the Pearson correlations for the six earnings benchmark measures, CEO compensation, other firm-level characteristics, and the key variable of interest, *Backdating*. The correlations between *Backdating* and the three just meeting/beating earnings benchmark measures (*JMBT1, JMBT2* and *JMBT3*) are positively associated at the 5 percent level or better. At the same time, *Backdating* is negatively correlated with one of the three just missing earnings benchmarks

Table 3
Pearson Correlations between Variables

This table presents Pearson correlations between six earnings benchmark measures, CEO compensation and other firm-level characteristics. Corresponding p-values are reported in italics. Reported p-values are highlighted by using bold and italics when significant (p-value<10 percent).

	Backdating	JMBT1	JMBT2	JMBT3	JMST1	JMST2	JMST3	SOXpost	Grantafter	Grantv	Exercise	Options	Bonus	Stock	Size	MB	leverage	ROA
Backdating	1.000																	
JMBT1	0.020	1.000																
	0.016																	
JMBT2	0.017	-0.058	1.000															
	0.033	***0.000***																
JMBT3	0.041	0.024	0.047	1.000														
	0.000	***0.004***	***0.000***															
JMST1	-0.002	0.167	-0.144	-0.062	1.000													
	0.815	***0.000***	***0.000***	***0.000***														
JMST2	0.011	0.063	-0.374	-0.006	0.280	1.000												
	0.180	***0.000***	***0.000***	*0.439*	***0.000***													
JMST3	-0.031	0.004	-0.033	-0.322	0.122	0.049	1.000											
	0.000	*0.620*	***0.000***	***0.000***	***0.000***	***0.000***												
SOXpost	0.004	-0.075	0.099	-0.015	0.005	0.016	-0.014	1.000										
	0.646	***0.000***	***0.000***	***0.064***	*0.564*	***0.049***	***0.082***											
Grantafter	-0.007	-0.001	0.022	0.012	-0.005	0.005	-0.013	-0.023	1.000									
	0.384	*0.910*	***0.008***	*0.143*	*0.568*	*0.547*	*0.111*	***0.005***										
Grantv	0.094	*0.036*	0.011	0.049	0.016	0.032	-0.038	0.002	0.070	1.000								
	0.000	***0.000***	*0.184*	***0.000***	***0.055***	***0.000***	***0.000***	*0.843*	***0.000***									
Exercise	0.070	-0.010	0.035	0.036	-0.084	0.000	-0.041	0.063	0.008	0.217	1.000							
	0.000	*0.239*	***0.000***	***0.000***	***0.000***	*0.981*	***0.000***	***0.000***	*0.349*	***0.000***								
Options	0.114	-0.011	0.052	0.077	-0.096	0.006	-0.075	0.016	0.004	0.324	0.418	1.000						
	0.000	*0.191*	***0.000***	***0.000***	***0.000***	*0.472*	***0.000***	***0.059***	*0.666*	***0.000***	***0.000***							

Bonus	0.015	-0.084	0.049	0.001	-0.203	-0.057	-0.093	0.076	0.045	0.156	0.166	0.243	1.000					
	0.076	***0.000***	***0.000***	*0.880*	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	0.000						
Stock	-0.018	-0.017	0.036	-0.018	-0.015	-0.006	-0.005	0.120	-0.063	-0.016	0.028	0.021	-0.077	1.000				
	0.028	***0.036***	***0.000***	***0.028***	***0.067***	*0.485*	*0.546*	***0.000***	***0.000***	***0.064***	***0.001***	***0.009***	***0.000***					
Size	-0.016	-0.138	0.075	-0.047	-0.112	0.007	-0.010	0.099	0.100	0.134	0.060	0.134	0.271	0.070	1.000			
	0.058	***0.000***	***0.000***	***0.000***	***0.000***	*0.421*	*0.221*	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***				
MB	0.062	0.011	0.079	0.112	-0.100	0.019	-0.065	-0.046	0.027	0.196	0.226	0.386	0.142	0.012	0.032	1.000		
	0.000	*0.194*	***0.000***	***0.000***	***0.000***	***0.023***	***0.000***	***0.000***	***0.001***	***0.000***	***0.000***	***0.000***	*0.000*	*0.147*	***0.000***			
Leverage	-0.074	-0.056	-0.069	-0.068	0.079	0.011	0.055	-0.080	0.003	-0.071	-0.116	-0.110	0.004	0.001	0.327	-0.081	1.000	
	0.000	***0.000***	***0.000***	***0.000***	***0.000***	*0.185*	***0.000***	***0.000***	*0.704*	***0.000***	***0.000***	*0.000*	*0.605*	*0.927*	***0.000***	***0.000***		
ROA	0.006	-0.010	0.155	0.099	-0.531	-0.172	-0.118	-0.034	0.007	-0.007	0.161	0.163	0.225	0.050	0.022	0.288	-0.242	1.000
	0.439	*0.243*	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	***0.000***	*0.398*	*0.398*	***0.000***	***0.000***	***0.000***	***0.000***	***0.006***	***0.000***	***0.000***	
	Backdating	JMBT1	JMBT2	JMBT3	JMST1	JMST2	JMST3	SOXpost	Grantafter	Granty	Exercise	Options	Bonus	Stock	Size	MB	leverage	ROA

measures at the 1 percent level, namely, JMST3, but has no correlation with the other two just missing earnings benchmark measures (*JMST1* and *JMST2*). These correlations provide first evidence that backdating firms have different reporting strategies on meeting/beating and missing earnings benchmarks. Consistent with H1, backdating firms are more likely to just meet or beat all three earnings benchmarks; in contrast to H2, backdating firms are less likely to miss analysts' forecasts (*JMST3*). The high correlations between the six meet/beat or miss earnings benchmarks with the compensation incentive variables and firm characteristic variables are in line with prior evidence that both incentives and company fundamental economic factors influence managers' meeting/beating or missing earnings benchmark behavior.

4.4.2 Main findings

Table 4 presents my main findings. Hypothesis H1 states that the just meeting or beating earnings benchmarks is more pronounced for firms involved in the option backdating scandal. I find strong evidence supporting this hypothesis. The coefficient of *Backdating* is significantly positive in all three meeting/beating earnings benchmark equations: coefficient=0.265, p-value =0.052 for the *JMBT1* equation; coefficient=0.195, p-value=0.016 for the *JMBT2* equation; coefficient=0.276, p-value=0.062 for the *JMBT3* equation. However, the results are not consistent with hypothesis H2, in which I expect that missing earnings benchmarks is more pronounced for firms involved in option backdating. Indeed, in contrast to my expectation, I find the coefficient on *Backdating* is significantly *negative* in the *JMST3* equation, which implies that backdating firms are *less* likely to just miss analysts' forecast. The coefficients on *Backdating* are not significantly different from zero for the *JMST1* and *JMST2* equations, which imply that there is no difference between these two groups in terms of reporting strategy of just missing positive earnings and sustaining last year's performance.

Consistent with prior findings, executive compensation, firm characteristics, and the regulation environment indeed affect managers' reporting strategies. *Bonus* is significantly negative in all six equations, which may imply that to get higher bonus, managers have incentives to continuously increase their earnings instead of having earnings reported around zero profit. The other compensation variables are significant in some equations. Whereas McAnally et al. (2008) find firms that miss earnings targets have larger and more valuable subsequent grants for their CEOs, I do not find that granting options within three months after earnings announcement (*Grantafter*)

Table 4

Pooled Logistic Regressions of Meeting/Missing Earnings Benchmarks on Stock Option Backdating Status and Other Control Variables

The table presents pooled logistic regressions of each of the six meeting/missing earnings benchmarks on an indicator variable (1=backdating firm, 0=otherwise) and other control variables. For the analyst forecast (JMBT3 and JMST3) equations, forecast error and number of analyst following are included as extra control variable. P-values below the estimated coefficients are based on standard errors clustered at the firm and year level. Significant coefficients (p-value<10 percent) are highlighted by using bold and italics. Variables are defined in Appendix 1.

$$\Pr ob(\textit{just meet(beat)} / \textit{miss}, \in \Phi_k) = logit(\lambda_{0,k} + \lambda_{1,k} Backdating + \lambda_{2,k} SOXpost + \lambda_{3,k} Grantafter + \lambda_{4,k} Grantv + \lambda_{5,k} Exercise + \lambda_{6,k} Options + \lambda_{7,k} Bonus + \lambda_{8,k} Stock + \lambda_{9,k} Size + \lambda_{10,k} MB + \lambda_{11,k} Leverage + \lambda_{12,k} ROA + \varepsilon_{i,t}) \quad (1)$$

Where just meet (beat)/miss benchmarks are two set of choices made by managers; Φ could be one of the following three earnings benchmarks: (1) positive earnings (2) last year's earnings; and (3) analyst forecasts.

Dependent	Intercept	Backdating	SOXpost	Grantafter	Grantv	Exercise	Options	Bonus	Stocks	Size	MB	Leverage	ROA	Ferror	Nest
JMBT1	0.165	0.265	-0.379	0.044	0.035	-0.002	0.000	-0.305	0.004	-0.280	0.007	-0.263	0.236		
	0.740	***0.052***	***0.017***	0.306	***0.000***	0.782	0.752	***0.000***	0.299	***0.000***	0.741	0.415	0.684		
JMBT2	-3.273	0.195	0.511	0.101	-0.006	-0.007	0.001	-0.071	-0.001	0.170	0.014	-0.665	7.122		
	0.000	***0.016***	***0.000***	***0.089***	0.229	0.246	0.637	***0.014***	0.772	***0.000***	0.226	***0.007***	***0.000***		
JMBT3	-0.156	0.276	0.056	0.041	0.010	-0.007	0.003	-0.075	0.001	-0.164	0.049	-0.003	2.050	0.124	0.042
	0.380	***0.062***	0.662	0.491	***0.091***	0.258	***0.021***	***0.008***	0.826	***0.000***	***0.000***	0.991	***0.000***	0.153	***0.000***
JMST1	1.380	-0.103	-0.076	0.098	0.005	0.005	-0.003	-0.211	0.008	-0.191	0.119	-0.782	-30.147		
	0.001	0.568	0.512	***0.103***	0.336	0.636	***0.017***	***0.000***	***0.058***	***0.000***	***0.000***	***0.015***	***0.000***		
JMST2	-0.454	0.055	0.071	0.005	0.005	0.004	0.000	-0.107	0.003	0.042	0.058	-0.447	-5.226		
	0.002	0.697	0.642	0.921	0.147	***0.031***	0.791	***0.001***	0.243	***0.024***	***0.000***	***0.006***	***0.000***		
JMST3	-0.961	-0.366	0.071	-0.059	-0.005	0.000	-0.003	-0.119	0.001	0.019	-0.002	0.018	-1.393	-4.831	-0.009
	0.000	***0.004***	0.238	0.260	0.387	0.998	***0.062***	***0.001***	0.629	0.406	0.833	0.893	***0.000***	***0.000***	***0.097***

Table 5

Pooled Logistic Regressions of Meeting/Missing Earnings Benchmarks on Stock Option Backdating Status and Other Control Variables in a Sample of Firms Matched on Industry

The table presents pooled logistic regressions of each of the six meeting/missing earnings benchmarks on an indicator variable (1=backdating firm, 0=otherwise) and other control variables. For the analyst forecast (JMBT3 and JMST3) equations, forecast error and number of analyst following are included as extra control variables. P-values below the estimated coefficients are based on standard errors clustered at the firm and year level. Significant coefficients (p-value<10 percent) are highlighted by using bold and italics. Variables are defined in Appendix 1.

$$\Pr ob(\,just\ meet(beat)\,/\,miss,\ \in \Phi_k) = logit(\lambda_{0,k} + \lambda_{1,k} Backdating + \lambda_{2,k} SOXpost + \lambda_{3,k} Grantafter + \lambda_{4,k} Grantv + \lambda_{5,k} Exercise + \lambda_{6,k} Options + \lambda_{7,k} Bonus + \lambda_{8,k} Stock + \lambda_{9,k} Size + \lambda_{10,k} MB + \lambda_{11,k} Leverage + \lambda_{12,k} ROA + \varepsilon_{i,t}) \quad (1)$$

Where Meeting/missing benchmarks are two set of choices made by managers; Φ could be one of the following three earnings benchmarks: (1) positive earnings (2) last year's earnings; and (3) analyst forecasts.

Dependent	Intercept	Backdating	SOXpost	Grantafter	Grantv	Exercise	Options	Bonus	Stocks	Size	MB	Leverage	ROA	Ferror	Nest
JMBT1	0.081	0.252	-0.296	0.067	0.030	0.003	0.000	-0.257	0.003	-0.276	0.001	-0.333	1.421		
	0.857	***0.015***	***0.068***	0.325	***0.000***	0.559	0.703	***0.001***	0.292	***0.000***	0.970	0.407	***0.011***		
JMBT2	-3.324	0.272	0.585	0.074	-0.006	0.000	0.000	-0.075	-0.001	0.168	0.006	-0.555	7.086		
	0.000	***0.007***	***0.000***	0.209	0.213	0.933	0.891	***0.106***	0.834	***0.000***	0.625	***0.011***	***0.000***		
JMBT3	-0.317	0.247	0.057	0.012	0.006	-0.003	0.001	-0.089	-0.002	-0.097	0.038	-0.161	1.848	0.046	0.029
	0.096	***0.084***	0.666	0.878	0.197	0.531	0.257	***0.019***	0.553	***0.004***	***0.004***	0.505	***0.000***	0.838	***0.002***
JMST1	1.763	0.017	-0.174	0.004	0.004	-0.002	-0.001	-0.137	0.007	-0.238	0.079	-1.016	-31.038		
	0.004	0.932	0.185	0.956	0.624	0.769	0.356	***0.024***	0.136	***0.001***	***0.006***	***0.011***	***0.000***		
JMST2	-0.242	0.006	0.013	0.011	0.004	0.003	0.001	-0.083	0.004	0.000	0.050	-0.158	-4.453		
	0.017	0.962	0.933	0.885	0.257	0.342	0.429	***0.014***	0.158	0.988	***0.000***	0.271	***0.000***		
JMST3	-1.064	-0.352	0.066	-0.038	-0.009	0.000	-0.002	-0.103	-0.001	0.031	-0.019	-0.036	-1.268	-6.751	-0.006
	0.000	***0.008***	0.268	0.578	0.202	0.969	0.237	***0.019***	0.745	0.352	0.223	0.843	***0.000***	***0.000***	0.401

influences managers' reporting strategies. The exceptions are in the *JMBT2* and *JMST1* equations, in which the coefficients on *Grantafter* are marginally positively significant at the 10 percent level. Moreover and again, in contrast to the evidence by McAnally et al. that the greater value of option grants subsequent to an earnings announcement, the more likely that managers will miss the earnings benchmarks, I find that managers are more likely to meet or beat earnings benchmarks: option grant value (*Grantv*) is significantly positive in the *JMBT1* and *JMBT3* equations (coefficient=0.035 and 0.014, p-value=0.010 and 0.091 respectively).

The results show that firms' economic fundamentals also contribute to firms' meeting/beating or missing earnings benchmark behavior. *MB*, *Leverage,* and *ROA* are significant in at least three out of six equations while *Size* is significant in five out of six equations. Finally, the effect of SOX is only significant in two out of six equations and the evidence is mixed. The coefficient on SOX is negative for the *JMBT1* equation and is positive for the *JMBT2* equation (coefficient= -0.379 and 0.511, p-value=0.017 and 0.000 respectively).

4.4.3 Additional analysis

Industry matched sample

As there is substantial clustering of backdating firms in some industries, concerns can be raised about the appropriateness of using the Compustat universe as a benchmark. I therefore estimate Equation (1) again in a sample of firms that consists only of those 2-digit SIC industries that contain backdating firms. This sample selection criterion reduces the sample size used in the main tests by about 40 percent. After deleting top and bottom one percent of outliers for all continuous variables, the final sample consists of 8,723 non-backdating firm-years and 373 backdating firm-years. Results are presented in Table 5. As before, I cluster standard errors at both the firm and year level. My results are consistent with those reported in Table 4. Backdating firms are more pronounced in meeting/beating earnings benchmarks and less likely to miss analysts' forecasted earnings.

Sub-sample of profitable and loss firms

Durtschi and Easton (2005) observe that beginning of year prices for small loss firms are systematically lower than the corresponding figures for small profit firms and this could induce the observed discontinuities in scaled earnings (i.e., fewer number of

firms which just miss zero earnings than firms just meet or beat zero earnings). I estimate equation (1) again using two sub- sample of firms that either consists of only profitable firms (ROA>=0) or consists of only loss making firms (ROA<0). The sample consists of 12,795 profitable firm-years (12,508 non-backdating firm-years and 287 backdating firm-years) and 2,560 loss firm-years (2,483 non-backdating firm-years and 77 backdating firm-years). I rerun the three meeting/beating equations using profitable sample firms and I rerun the three missing equations using loss making sample firms and I also cluster standard errors at both the firm and year level. The results are highly consistent with those reported in Table 4 (results are not tabulated); more importantly, the coefficients on *Backdating* remain unchanged in terms statistical significance.

Alternative earnings benchmark measures

I rerun equation (1) using different measures of just meeting/beating or missing earnings benchmark variable. For example, I define just meeting/beating earnings benchmarks as earnings scaled by beginning of year market value larger than zero but smaller than 3 percent rather than 2 percent; meeting/beating financial analysts' forecast by 3 cents rather than 2 cents. Just missing earnings benchmarks are defined as earnings scaled by beginning of year market value smaller than zero but larger than minus 3 percent; missing financial analysts' forecast by 3 cents rather than 2 cents. The original inferences remain valid (results are not tabulated). I also use total assets instead of market value of the firm to scale earnings, the inferences are not changed (results are not tabulated).

Quarterly data analysis

Prior work uses either annual data or quarterly data to examine firms' meeting/beating or missing earnings targets reporting behavior for different research purposes. Authors who address compensation incentives or other annual based incentives (e.g., income taxes) usually rely on annual data since compensation for managers are not available on the quarterly basis and managers are often rewarded based on annual performance (e.g., Phillips et al. 2003; Cheng and Warfield 2005; McAnally et al. 2008; Cohen et al. 2008). Studies that do not need to address compensation incentives often employ quarterly data (e.g., Degeorge et al. 1999; Bartov et al. 2002; e.g., Brown and Caylor 2005; Bartov and Cohen 2007). Following the convention in prior work, given my research question and design, I use annual data

in the main analysis. However, to see whether the phenomenon I document is mainly annual and not quarterly, I rerun equation (1) with quarterly data keeping all annual compensation figures in the regression (results unreported). The results show that backdating firms do not differ significantly from other firms in meeting/beating quarterly positive earnings and last quarter's earnings. Their attention is focused more on meeting/beating financial analysts' forecasts. For the three missing earnings target equations, the results are the same with those reported in Table 4. The results are not surprising in the sense that, since mid-1990s, investor reactions to meeting/beating (miss) analysts' forecasts are larger than to meeting/beating other earnings benchmarks (Brown and Caylor 2005). As a result, firms may shift their attention from meeting/beating quarterly positive or last quarter's earnings to meeting/beating the expectations formed by analysts. Furthermore, the results are also consistent with the prior research that firms are particularly concerned whether the annual reported earnings are positive and exceed last year's earnings since managers' compensation schemes, regulatory requirements, and bond covenants are usually based on annual earning figures; therefore firms often use their final fiscal quarter to meet these annual earnings targets rather than manipulate earnings numbers in every quarter (Das and Shroff 2002; Dhaliwal et al. 2004; Jacob and Jorgensen 2007; Kerstein and Rai 2007). In sum, the evidence is consistent with the idea that positive earnings and sustaining recent earnings performance benchmarks are mostly important on an annual basis. For quarterly reporting, analyst forecasts continue to be important.

4.5 Discussion, limitations, and conclusions

According to the prior literature, managers have incentives to *just meet/beat* some earnings benchmarks and they also have incentives to *just miss* earnings benchmarks (McAnally et al. 2008). Controlling for economic fundamental factors, both reporting behaviors are considered as earnings management. Prior literature shows that both the compensation incentives of managers and firm characteristics are associated with just meeting/beating or missing earnings benchmark behaviors. I predict that, in addition to compensation incentives and firm characteristics, a manager's type also plays a significant role in explaining meeting/beating or missing earnings benchmarks. I empirically test my conjecture using the stock option backdating scandal as a setting in which a considerable number of managers have revealed themselves as being willing to commit fraud or gain some personal benefit at

the expense of the stakeholders of the company. I examine whether meeting/beating or missing earnings benchmarks is more pronounced for firms with managers involved in option backdating. I argue that managers involved in backdating are less concerned about the negative consequences of their actions on other stakeholders of the company and are more likely to manage their earnings in order to meet/beat or miss earnings target. Consistent with my first hypothesis, the results show that managers involved in backdating are more likely to meet or narrowly beat the target of positive earnings, prior year earnings, and financial analysts' forecasts. In contrast to my second hypothesis, managers involved in backdating are *less likely to just miss* analysts' forecasts. Putting the evidence together, a manager's type does play a role in earnings management in terms of just meeting/beating or missing behavior, but it is less beneficial for backdating managers to use a missing earnings benchmark strategy to obtain the gain of a lower strike price on subsequent option grants. This is not completely surprising as backdating managers can obtain lower strike prices via backdating their options and other strategies rather than manipulating their earnings to miss the earnings targets. Furthermore, managers involved in backdating will be cautious not to attract scrutiny of investors triggered by unfavorable earnings surprises since they have strong reasons to conceal their backdating behavior.

My conclusions about the influence of managers' type on financial reporting behavior are conditional on the assumption that all firm characteristic variables related with the manager's type are included in the model. While I follow the prior literature in my regression specifications and include many variables that have been identified in earlier work, I cannot exclude the possibility that there is an omitted correlated variable problem. I also concede that incentives might simultaneously drive backdating behavior *and* managerial reporting patterns. By controlling for incentives in the regression, I reduce as much as possible this endogeneity problem (Wooldridge 2002; Nikolaev and Van Lent 2005).

Despite this issue, this paper is the first to provide evidence that, in addition to compensation incentives and firm characteristics, a manager's type plays a significant role in meeting/beating or missing earnings benchmark behavior. Secondly, this paper suggests that non-accounting scandals have some implications on accounting issues, and finally this paper adds to the ongoing discussion whether the conclusion of earnings management can be gleaned from examining differences in benchmark beating/missing behavior.

4.6 References

Aboody, D., and R. Kasznik. 2000. CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures. *Journal of Accounting & Economics* 29 (1):73-100.

Baker, T., D. Collins, and A. Reitenga. 2003. Stock Option Compensation and Earnings Management Incentives. *Journal of Accounting, Auditing & Finance* 18 (4):557-582.

Bartov, E., and D. A. Cohen. 2007. *Mechanisms to Meet/Beat Analyst Earnings Expectations in the Pre- and Post-Sarbanes-Oxley Eras*: NYU Law and Economics Research Paper No. 07-18 Available at SSRN: http://ssrn.com/abstract=954857.

Bartov, E., D. Givoly, and C. Hayn. 2002. The Rewards to Meeting or Beating Earnings Expectations. *Journal of Accounting and Economics* 33 (2):173-204.

Bartov, E., and P. Mohanram. 2004. Private Information, Earnings Manipulations, and Executive Stock-Option Exercises. *The Accounting Review* 79 (4):889-920.

Bhushan, R. 1989. Firm Characteristics and Analyst Following. *Journal of Accounting and Economics* 11 (2-3):255-274.

Brown, L. D. 2001. A Temporal Analysis of Earnings Surprises: Profits Versus Losses. *Journal of Accounting Research* 39 (2):221-241.

Brown, L. D., and M. L. Caylor. 2005. A Temporal Analysis of Quarterly Earnings Thresholds: Propensities and Valuation Consequences. *The Accounting Review* 80 (2):423-440.

Burgstahler, D., and I. Dichev. 1997. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting & Economics* 24 (1):99-126.

Chauvin, K. W., and C. Shenoy. 2001. Stock Price Decreases Prior to Executive Stock Option Grants. *Journal of corporate finance* 7 (1):53-76.

Cheng, Q., and T.-D. Warfield. 2005. Equity Incentives and Earnings Management. *Accounting Review* 80 (2):441.

Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods. *The Accounting Review* 83 (3):p. 757-787.

Das, S., and P. K. Shroff. 2002. Fourth Quarter Reversals in Earnings Changes and Earnings Management. *Working paper, Univeristy of Minnesota*.

Daske, H., G. Gebhardt, and S. McLeay. 2006. The Distribution of Earnings Relative to Targets in the European Union. *Accounting and business research* 36:137-168.

DeFond, M.-L., and J. Jiambalvo. 1994. Debt Covenant Violation and Manipulation of Accruals. *Journal of Accounting and Economics* 17 (1-2):145.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings Management to Exceed Thresholds. *The Journal of Business* 72 (1):1-33.

Dhaliwal, D. S., C. A. Gleason, and L. F. Mills. 2004. Last-Chance Earnings Management: Using the Tax Expense to Meet Analysts' Forecasts. *Contemporary Accounting Research* 21 (2):431-459.

Dichev, I. D., and D. J. Skinner. 2002. Large-Sample Evidence on the Debt Covenant Hypothesis. *Journal of Accounting Research* 40 (4):1091-1123.

Durtschi, C., and P. Easton. 2005. Earnings Management? The Shapes of the Frequency Distributions of Earnings Metrics Are Not Evidence Ipso Facto. *Journal of Accounting Research* 43 (4):557-592.

———. 2008. Earnings Management? Averaging, Sample Selection Bias, and Scaling Lead to Erroneous Inferences, Working paper, University of Notre Dame.

Fields, T. D., T. Z. Lys, and L. Vincent. 2001. Empirical Research on Accounting Choice. *Journal of Accounting & Economics* 31 (1-3):255-307.

Graham, J.-R., C.-R. Harvey, and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40 (1-3):3-73.

Healy, P. M. 1985. The Effect of Bonus Schemes on Accounting Decisions. *Journal of Accounting and Economics* 7 (1-3):85-107.

Jacob, J., and B. N. Jorgensen. 2007. Earnings Management and Accounting Income Aggregation. *Journal of Accounting & Economics* 43 (2/3):369-390.

Jiang, J. 2008. Beating Earnings Benchmarks and the Cost of Debt. *The Accounting Review* 83 (2):377-416.

Kerstein, J., and A. Rai. 2007. Intra-Year Shifts in the Earnings Distribution and Their Implications for Earnings Management. *Journal of Accounting & Economics* 44 (3):399-419.

Lopez, T., and L. Rees. 2002. The Effect of Beating and Missing Analysts' Forecasts on the Information Content of Unexpected Earnings. *Journal of Accounting, Auditing & Finance* 17 (2):155-184.

McAnally, M. L., A. Srivastava, and C. D. Weaver. 2008. Executive Stock Options, Missed Earnings Targets and Earnings Management. *The Accounting Review* 83 (1):185-216.

McVay, S., V. Nagar, and V. W. Tang. 2006. Trading Incentives to Meet the Analyst Forecast. *Review of Accounting Studies* 11 (4):575-598.

Meek, G. K., R. P. Rao, and C. J. Skousen. 2007. Evidence on Factors Affecting the Relationship between CEO Stock Option Compensation and Earnings Management. *Review of Accounting & Finance* 6 (3):304-323.

Nikolaev, V., and L. Van Lent. 2005. The Endogeneity Bias in the Relation between Cost-of-Debt Capital and Corporate Disclosure Policy. *European Accounting Review* 14 (4):677-724.

Petersen, M. A. 2008. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *Review of Financial Studies*:hhn053.

Phillips, J., M. Pincus, and S. O. Rego. 2003. Earnings Management: New Evidence Based on Deferred Tax Expense. *The Accounting Review* 78 (2): 491-521.

Robinson, D., and D. Glushkov. 2006. A Note on IBES Unadjusted Data: Wharton Research Data Services.

Skinner, D. J., and R. G. Sloan. 2002. Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio. *Review of Accounting Studies* 7 (2-3):289-312.

Wooldridge, J. M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA [etc.]: MIT Press.

4.7 Appendix 1 Variable definitions

- Backdating: This measure is an indicator variable which equals one if the sample firm in a certain year is identified as having its stock options backdated, zero otherwise.

- JMBT1: This measure is an indicator variable which equals one if earnings divided by lagged market value is equal to or larger than 0.00 but less than 0.02; zero otherwise.

- JMBT2: This measure is an indicator variable which equals one if the change in earnings divided by lagged market value is equal to or larger than 0.00 but less than 0.02; zero otherwise.

- JMBT3: This measure is an indicator variable which equals one if a firm's earnings per share beats or meets the most recent analyst's forecast in year t by less than two cents; zero otherwise.

- JMST1: This measure is an indicator variable which equals one if earnings divided by lagged market value is less than 0.00 but greater than -0.02; and zero otherwise, or, if earnings divided by lagged market value is less than 0.00 and is in the lowest quartile for that 2-digit industry for that year; and zero otherwise.

- JMST2: This measure is an indicator variable which equals one if change in earnings divided by lagged market value is less than 0.00 but greater than -0.02; zero otherwise, or, if change in earnings divided by lagged market value is less than 0.00 and is in the lowest quartile for that industry for that year; and zero otherwise.

- JMST3: This measure is an indicator variable which equals one if a firm's earnings per share miss the most recent analyst's forecast by less than two cents, or, if a firm's earnings per share miss the most recent analyst's forecast and is in the lowest quartile for that 2-digit industry for that year; and zero otherwise.

- SOXpost: This variable is an indicator variable which equals one if the observation is after the end of the second quarter of 2002; zero otherwise.

- Grantafter: This measure is an indicator variable which equals one if firm í issues option grants to its CEO within three months after its earnings announcement.

- Exercise: This measure is defined as the value of options exercised by the CEO of firm í deflated by the CEO's salary for year t.

- Options: This variable is defined as the value of options held by the CEO of firm í deflated by the CEO's salary for year t.

- Bonus: This variable is defined as the value of bonus gained by the CEO of firm í deflated by the CEO's salary for year t.

- Stock: This variable is defined as the value of shares held by the CEO of firm í deflated by the CEO's salary for year t.

- Size: This variable is defined as the natural log of firm í's total assets at the end of year t.

- MB: This variable is defined as the market value of equity of firm í divided by book value of equity.

- Leverage: This variable is defined as firm í's long-term debt divided by total assets at the end of year t.

- ROA: This variable is defined as firm í's earnings divided by total assets at the end of year t.
- Ferror: This measure is defined as the difference of actual earnings per share and the first analyst's forecast in year t.

- Nest: This measure is defined as the average number of analyst following company ί in year t.

4.8 Appendix 2 firms involved in stock option backdating scandal

Company name	Start year	End year
Activision Inc.	1993	2006
Affiliated Computer Services -Cl A	1994	2005
Affymetrix Inc.	1997	1999
Agile Software	1999	2003
American Tower Corp.	2005	2006
Amkor Technology Inc.	1998	2005
Analog Devices	1998	2001
Apollo Group Inc. -Cl A	1994	2005
Apple Computer Inc.	1997	2002
Applied Micro Circuits Corp	1998	2002
Applied Signal Technology	1998	2005
Aspen Technolog	1996	2004
Atmel Corp.	1993	2004
Autodesk Inc.	1998	2006
Barnes & Noble Inc.	1996	2006
Bea Systems	1997	2006
Bed, Bath & Beyond	1998	2004
Biomet	1996	2006
Black Box	1995	2002
Blue Coat Systems Inc.	2000	2004
Boston Communications Group	1998	2002
Broadcom Corp. -Cl A	1998	2003
Brocade Communications Systems	2000	2004
Brooks Automation Inc.	1996	2005
Ca Inc.	1996	2006
Cablevision Sys Corp. -Cl A	1997	2002
Caremark Rx Inc.	1994	2005
Cec Entertainment Inc.	1989	2005
Ceradyne Inc.	1997	2003
Cheesecake Factory Inc.	2000	2006
Children's Place	2003	2005
Cirrus Logic Inc.	1997	2005
Clorox Co/De	1996	2006
Cnet Networks Inc.	2003	2005
Computer Sciences Corp.		
Comverse Technology Inc.	1991	2002
Corinthian Colleges Inc.		
Costco Wholesale	2005	2006

Crown Castle Intl Corp.	1998	2001
Cyberonics Inc.	1999	2003
Delta Petroleum	1997	2004
Dot Hill Systems Corp.	2000	2003
Electronic Arts	1997	2006
Emcore	2000	2003
Endocare Inc.	1997	2002
Engineered Support Systems	2000	2006
Eplus Inc.	1997	2006
Extreme Networks Inc.		
F5 Networks Inc.	1995	2006
Forrester Research	1998	2004
Foundry Networks Inc.	1995	2006
Getty Images	1999	2002
Hansen Natural		
Hcc Insurance Holdings	1995	2006
Healthsouth Corp.	1995	2002
Home Depot Inc.	1981	2001
Ibasis	1999	2006
Insight Enterprises	1996	2006
Integrated Silicon Solution	1995	2006
J2 Global Communications Inc.		
Jabil Circuit Inc.	1998	2001
Juniper Networks Inc.	2003	2006
Kb Home	1998	2005
Keithley		
King Pharmaceuticals	2000	2001
Kla-Tencor Corp.	1991	2005
Kos Pharmaceuticals Inc.	2001	2003
L-3 Communications Hldgs Inc.	1998	2006
Marvell Technology Group Ltd.	2000	2006
Maxim Integrated Products		
Mcafee Inc.	2000	2002
Meade Instruments Corp.	1998	2002
Medarex Inc.	2000	2006
Mercury Interactive Corp.	1996	2002
Michaels Stores Inc.	1990	2001
Microsoft Corp.	1992	1999
Microtune	2000	2003
Mips Technologies		

Molex Inc.	1994	2006
Monster Worldwide Inc.	1997	2001
Msystems	2001	2005
Newpark Resources	2001	2003
Novell Inc.	1996	2005
Novellus Systems Inc.	1997	2002
Nvidia Corp.	2000	2006
Nyfix Inc.	2000	2006
Openwave Systems Inc.	1995	2006
Pediatrix	1995	2001
Pixar	1997	2001
Pmc-Sierra Inc.	1998	2001
Power Integrations Inc.	1999	2004
Progress Software Corp.	1995	2002
Quest Software Inc.	2000	2005
Rambus Inc.	1990	2005
Redback Networks Inc.		
Renal Care Group Inc.	1997	2002
Research In Motion	1997	2002
Restoration Hardware Inc.	2002	2004
Rsa Security Inc.	1999	2005
Safenet Inc.	2000	2006
Sanmina-Sci Corp.	1997	2006
Sapient	1997	2001
Semtech Corp.	2002	2006
Sepracor Inc.	2003	2006
Sharper Image	2003	2005
Sigma Designs Inc.	1994	2005
Silicon Image	2000	2005
Sonus Networks	2000	2003
Stolt-Nielsen	2003	2004
Sunrise Telecom	2001	2005
Sun-Times Media	1999	2002
Sycamore Networks Inc.	2000	2005
Take-Two Interactive Software	1997	2003
Thq Inc.	1996	2005
Trident Microsystems Inc.	1995	2004
Ulticom Inc.	2002	2005
Unitedhealth Group Inc.	1999	2002
Valeant Pharmaceuticals	1997	2006

Verint Systems Inc.	1991	2002
Verisign Inc.	2001	2005
Vitesse Semiconductor Corp.	1995	2006
Western Digital Corp.	1999	2003
Wind River		
Witness Systems Inc.	2000	2002
Zoran Corp.	1997	2005
Flir Systems	1996	2001
Altera Corp.	1996	2000
Asyst Technologies Inc.	1997	2006
Gap Inc.		