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Honesty Is the Best Policy—When There Is Money in It

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Publication date:
2007

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):

Jia, Y. (2007). *Honesty Is the Best Policy—When There Is Money in It: Can Firms Promote Honest Reporting Behavior by Managers?* (CentER Discussion Paper; Vol. 2007-28). Accounting.

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No. 2007–28

HONESTY IS THE BEST POLICY-WHEN THERE IS MONEY IN IT: CAN FIRMS PROMOTE HONEST REPORTING BEHAVIOR BY MANAGERS?

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March 2007

ISSN 0924-7815

Honesty Is the Best Policy—When There Is Money in It*: Can Firms Promote Honest Reporting Behavior by Managers?

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March, 2007

I am indebted to Eddy Cardinaels and Laurence van Lent for insightful comments and for their encouragement. I thank Margaret Abernethy and Ranjani Krishnan for their helpful comments. I also thank workshop participants at Tilburg University. I acknowledge financial support from the Netherlands Organization for Scientific Research (project number 017.001.101).

* Mark Twain: Speech to Eastman College (1901)

Honesty Is the Best Policy—When There Is Money in It: Can Firms Promote Honest Reporting Behavior by Managers?

Abstract

This paper provides experimental evidence on how incentive compensation, peer-group behavior, and audit (team) effectiveness influence managerial reporting behavior. Results show that an increase in incentive compensation intensity induces subjects to report less truthfully. High level of peer honesty promotes truthful reporting; however, the effects are weaker when incentive compensation intensity is high. Audit (team) effectiveness shows no significant influence on reporting behavior. The results provide the first clear evidence that firms need to consider carefully the effect of incentive compensation as well as the influence of peer groups when designing contracts. Furthermore, without a credible penalty for untruthful financial report, increased audit (team) effectiveness will not promote honest reporting.

JEL classification: G30; J33; M41

Keywords: Managerial honesty; Incentive compensation intensity; Peer behavior; Audit effectiveness

Honesty Is the Best Policy—When There Is Money in It: Can Firms Promote Honest Reporting Behavior by Managers?

1. Introduction

Accounting regulators, investors, and media pundits alike have expressed a growing concern about the apparent lack of honesty in the financial reports of firms. Triggered by many cases in which managers putatively 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. I investigate how incentive compensation, peer-group behavior, and audit (team) effectiveness influence managerial reporting. Together these three factors represent both monetary and non-monetary components and encapsulate many of the mechanisms that have been put forward to promote honest reporting behavior by regulators and academics. Nevertheless, only very limited empirical evidence exists about their effects. Furthermore, while many researchers have identified the need to combine insights from economics and behavioral sciences into accounting theories, this call has gone unanswered for a long time.

Only recently have researchers started to document that behavioral factors explain as much of managerial reporting behavior as do economic factors (Young 1985; Chow et al. 1988; Evans et al. 2001; Stevens 2002; Stevens and Thevaranjan 2003; Yu 2004). Evans et al. (2001) argue that neither conventional agency models nor types models¹ (Koford and Penno 1992) can explain reports that are “partially honest”, i.e., reports that are neither purely wealth-maximizing nor purely honest. These studies have made a considerable contribution to integrating economic and behavioral factors in accounting research, but there is still little known on how managers balance their interests for wealth (e.g., compensation) and other, non-monetary, considerations when deciding on the honesty of their reports (Luft 1997; Evans et al. 2001; Sprinkle 2003). For this reason, I combine both monetary incentives (incentive compensation intensity) and non-monetary governance mechanisms (peer-group behavior and auditing effectiveness) to investigate empirically their possibly counteractive influences on managerial reporting behavior.

¹In agency model, a person (agent) is assumed to maximize his or her utility function, which depends only on the individual’s consumption. In types model, people are assumed either ethical or not ethical (purely self-interested), where ethical agents always tell the truth, regardless of the cost; self-interested agent will always cheat in order to maximize wealth.

As an interest-alignment tool between managers and firms, incentive compensation has attracted a lot of attention due to its effectiveness in increasing firm performance. Recently, some authors (e.g., Bruner et al. 2005; Denis et al. 2005; Bergstresser and Philippon 2006) have suggested that high incentive intensity could cause undesired managers' reporting behaviors within the legal boundary and beyond legal boundary (e.g., earnings management and fraudulent reporting). However, other researchers (e.g., Erickson et al. 2006) find no consistent evidence that incentive compensation is associated with accounting fraud. Given its popularity and importance in practice and the ambiguous results from earlier research, more evidence regarding its potential to cause undesirable behavior is warranted.

Meanwhile, both practitioners and academics are seeking effective governance tools, such as executive compensation, concentrated holding, monitoring by boards of directors etc., to address such unwanted behavior. Besides these formal governance mechanisms, accounting researchers have explored and identified a number of behavioral factors as informal governance tools to promote the truthfulness of managerial reporting (e.g., Chow et al. 1988; Evans et al. 2001; Sprinkle et al. 2002; Stevens 2002; Stevens and Thevaranjan 2003; Yu 2004; Stevens and Thevaranjan 2005; Hannan et al. 2006). However, among all the mechanisms that can be used, little attention has been given to the influence of peer-group reporting behavior on managerial honesty, although a relation is likely given the evidence in associated fields (see, e.g., Bernheim 1994; Barron and Gjerde 1997; Huddart and Fischer 2004; Slemrod 2004). I examine whether peer-group behavior affects the honesty of managerial reporting.

Only examining the role of peer behavior and ignoring the role of formal governance mechanisms may overemphasize the former. Furthermore, the social ethical environment should be studied together with more formal governance mechanism (Sprinkle 2003). Given the reasoning, the presence of a formal governance mechanism is necessary. I operationalize formal governance mechanisms in terms of auditing effectiveness of internal audit team for the following reasons. Firstly, internal audit team, viewed as eyes and ears of the audit committee of a firm, is a commonly used corporate formal governance mechanism in practice; one of its most important functions is to assist audit committee in fulfilling its oversight responsibilities for 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 et al. 2006a p. 1). Secondly, the evidence regarding the relation between governance practice effectiveness and earnings

constraint behavior is still inconsistent. Some researchers (Peasnell et al. 2000; Chtourou et al. 2001; Xie et al. 2001; Carcello et al. 2006b; Klein 2006) find that effective board and audit committee (in terms of board composition, board independence and member's financial sophistication) constrain earnings management activities. While Bown et al. (Bowen et al. 2005) find that there is no clear evidence that poor governance quality is related with managerial accounting discretion. Thirdly, by using an experimental design, the effectiveness of audit and the extent of misreporting can be directly measured and thus I can provide more direct evidence. Therefore, I examine audit (team) effectiveness, together with peer-group behavior, and explore their influence on managerial reporting behavior.

I conduct an experiment in which subjects report a cost number to upper-management (who only know the range for this number) while subjects know the true cost. Subjects are paid based on a division's profit defined as the difference between output value and reported cost of the project, creating an incentive to underreport the cost. The dependent variable is (the degree of) honesty in a manager's report², i.e., the extent to which a report accurately reflects the true costs (Evans et al. 2001; Hannan 2005; Hannan et al. 2006). The within-subject factor is incentive compensation intensity in which the managers receive either 50% or 10% of a division's reported profit. The other two governance mechanisms are between-subject factors. The first one is peer-group behavior, which is manipulated as having either a high or a low level of peer honesty in reporting. The second one is audit (team) effectiveness, where the detection probability for misreporting is twice as high in the high effectiveness setting compared with that in the low effectiveness setting.

I also control gender and social value orientation (SVO) score of the subjects in the analysis. SVO is known to influence individual behavior in payoff distribution settings. Based on SVO score, the subjects are classified into proselves and prosocials (proselfs are known to be more concerned about information regarding their own outcomes, where prosocials tend to maximize joint outcomes and are concerned for the well-being of others).

The results suggest that while there is incentive for people to misrepresent cost (in order to maximize compensation), people are, in general, quite truthful in making their reporting decisions. Both monetary and non-monetary governance mechanisms do have an effect on managerial reporting. More importantly, findings show that these mechanisms interact with each other. Specifically, I find that managerial honesty decreases with incentive

² In this setting, managerial honesty is directly related to the manager's own payoff and to a firm's profit, since managers' compensation is subtracted from profit.

compensation intensity (i.e., managerial honesty is lower under a 50% incentive compensation scheme than under a 10% scheme). Managerial honesty is significantly higher when subjects observe that the majority (75-90% of the population) of their peers are honest. The effect of peer reporting behavior is, however, smaller when incentive-intensity is high. In contrast to my expectation, audit (team) effectiveness is not associated with managerial honesty. Finally, contrast to Benabou and Triole's (2006) observations that extrinsic incentives can crowd out "intrinsic motivation", I find that prosocial managers always make more honest reports than proself managers. Another interesting finding is that male participants tend to underreport true cost more than women when facing higher incentive intensity.

The contribution of this paper is twofold. First, the evidence in this study speaks directly to the effectiveness of (governance) mechanisms aimed at promoting truthful reports, which are found in practice. For example, audit (team) effectiveness, and publicly revealing budgets of peer managers are frequently mentioned as helpful to promote truthful reporting.³ Nevertheless, these governance-tools are only just finding their way into companies. To the best of my knowledge, I am the first to investigate empirically the effects of peer reporting behavior on the truthfulness of managerial reporting both in its own right and with respect to its interplay with monetary incentives. The implications of the findings give support for practitioners to invest in a highly ethical environment. Second, the results reveal that research of this sort may encounter an omitted variable bias without controlling individual differences, such as SVO and gender, since these variables do matter with respect to truthful managerial reporting.

2. Hypotheses development

I start with my hypothesis for incentive compensation intensity, followed by prediction for non-monetary governance mechanisms—peer honesty and audit (team) effectiveness. Then the interactive effects between incentive intensity and non-monetary governance mechanisms are discussed. Finally the control variables are explained.

³ 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 render an individual manager an outcast.

2.1 Incentive compensation intensity

Incentive compensation is commonly used to mitigate the conflict of interest between principals and managers. Incentive compensation is said to be effective in encouraging and motivating managers to work harder. However, managers may also be motivated to increase their compensation at the expense of the firm. The more incentive-intensive compensation is, the higher the payoff from manipulating the performance measures. Consistent with this argument, Bergstresser and Philippon (2006) provide evidence that companies with more “incentivized” CEOs have higher levels of earnings management. Bruner et al. (2005), using experiments, 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 consistent evidence that (equity) incentive compensation are associated with fraud. Given the inconsistent evidence, I hypothesize the relation between managers’ incentive compensation and reporting behavior in a null form:

H1. *The truthfulness of a manager’s report is not influenced by the incentive compensation-intensity.*

2.2 Non-monetary governance mechanisms

Peer managers’ reporting behavior: Both psychologists and economists believe that individuals conform to norms of behavior established by their peers’ actions; much of people’s behavior then is influenced by their 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) for an undesirable action when other individuals undertake such action as well (Rotter 1966; Kohlberg 1984; Huddart and Fischer 2004).

So far, previous researchers have not examined directly the relation between peer managers’ behavior and truthful reporting. Nevertheless, there is some evidence in other fields that is suggestive of the influence of peers. For example, tax compliance researchers (Jackson and Milliron 1989; Trivedi et al. 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. Huddart and Fischer (2005) show in a model how “established norms” or “peer pressure” can influence an individual’s (un)desirable actions (i.e., earnings manipulation by managers). Given the 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 and Sivaramakrishnan 1991; Boyle 1993; Kachelmeier and Shehata 1997). Usually, the process of internal auditing consists of two potential stages. In the first stage, the audit team has to detect any opportunistic behavior whereas in the second stage a penalty might be considered. I focus on the first stage and examine whether auditing effectiveness, in its own right, is sufficient to prevent opportunistic behavior. In this setting, increasing the detection probability reduces the ex-post information asymmetry between managers and headquarters⁴. While no earlier evidence exists regarding this type of information asymmetry, several studies have investigated 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). Note that in the current setting information asymmetry can only be reduced after the reporting decision has been made. Indeed, to establish whether managers have reported truthfully or not is only possible after they make their reports. Though the mixed evidence exists regarding (pre-decision) information asymmetry, given that increased audit effectiveness can reduce (after-decision) information asymmetry in this setting, I predict that less information asymmetry lead managers to report more truthfully.

H3. *Audit (team) effectiveness has a positive effect on the truthfulness of managerial report.*

⁴ 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). 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, p. 747).

2.3 Interactive effects

Koford and Penno (1992) argue that whether a person behaves ethically depends on, to some extent, balancing self-interests against the interest of others or, balancing self-interest against some moral standards. Brickley et al (1997) also argue that the level of honesty declines as the payoff to lying increase. These arguments suggest the presence of interactive effects between incentive compensation and governance mechanisms examined in this paper.

Consistent with these views, managers will trade off their own wealth and the desire to behave the same as their peers when their peers report truthfully. With high incentive-intensive contracts, the costs of following their peers are higher since the managers need to forgo larger amounts of money by reporting truthfully. Given this expected high cost of following their peers, I predict that subjects will less likely to follow their honest peers when they have high incentive-intensive contracts.

For the interaction between incentive compensation intensity and audit (team) effectiveness, I also expect that the effect of audit (team) effectiveness on managerial honest reporting will be lower under stronger monetary incentives since it is too costly for a manager to be honest in this situation.

H4A. *There is an interactive effect between incentive compensation-intensity and peer reporting behavior on the truthfulness of managerial report.*

H4B. *There is an interactive effect between incentive compensation-intensity and audit (team) effectiveness on the truthfulness of managerial report.*

2.4 Control variables: social value orientation (SVO) and gender

Besides gender, which is found an important control variable in explaining reporting behavior (Schwartz and Wallin 2002), individuals also tend to differ systematically in their personal preference for a particular distribution of payoffs to themselves and another party. Researchers found this personal preference might play a role in limiting misrepresentations (Fehr and Schmidt 1999; Fehr and Schmidt 2003). The individual preference is called social value orientation (SVO) (Messick and McClintock 1968; Kuhlman and Marshello

1975; Liebrand et al. 1986; McClintock and Liebrand 1988; Van Lange et al. 1997; Michael et al. 2004).

In this setting, 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 prosocial or proself based on SVO scores (Van Lange et al. 1997). Proselfs are more concerned about their own wellbeing and the consequences of exploitation (also described as greed). They are less concerned about the well-being of others (Derlega and Grzelak 1982; Camac 1992; Van Lange et al. 1997; Nauta et al. 2002). In contrast, prosocials tend to maximize joint outcomes and are concerned for the well-being of others. Based on the classifications, I will explore whether proself managers are more likely to report untruthfully in order to maximize their own payoff and, in contrast, whether prosocial managers are less likely to benefit themselves at the expense of the firm by reporting untruthfully.

3. Method and design

A computer-based experiment is conducted to examine the factors of interest. The case materials were adapted from several studies (Evans et al. 2001; Hannan et al. 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 output value minus the reported costs. Managers can maximize their wealth by underreporting the cost figures⁵. Participants are paid based on the results in all 10 rounds (experiment euros are converted to real money).

3.1 Manipulations

I manipulated three experimental factors: incentive-intensity is manipulated within subject; peer-group behavior and audit effectiveness are manipulated between subjects.

⁵ A common real life situation is in the initial phases of a project/investment decision. A manager will often underestimate the cost to get approval for the investment and to be rewarded positively on the number of investment projects he gets.

Incentive compensation intensity (ICI): For each experimental round, the compensation for division managers specified by headquarters is either 10% or 50% of the reported division's profit (output value – reported cost). The 10 rounds alternated between the two compensation contracts and were counterbalanced across sessions to control for order effects (i.e., either 10%-50% or 50%-10%). In sum, each subject plays five rounds with low incentive compensation and five rounds with high incentive compensation.

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

Audit (team) effectiveness (AE): In the experimental instructions, subjects learn about the fact that the headquarters of the firm will send an audit team to their division to investigate their reported costs. Headquarters also determine whether the firm either has at least one financial expert serving on its audit team or does not have a financial expert. All participants are informed that the audit team has some incomplete knowledge about the true costs of the project and will form an opinion about the managers' reported costs (i.e., either favorable or unfavorable). Then the audit team will send a message to both the manager and the headquarters based on its findings. If its opinion is favorable, the following message is displayed:

"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 participant 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"

The audit team is modeled to detect the untruthful reporting with certain probabilities. Subjects do not receive information about the probability of detection; they learn this in the process of play. In case of an audit team with low effectiveness, the detection probability is increasing with the level of deviation from a truthful report with an equal rate: if managers deviate by no more than 10%, 20%, 30%, 40% or above from a truthful report, there is a corresponding 10%, 20%, 30%, 40%, and 50% probability of being detected. In case of an effective audit team, the detection probability doubles compared to 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.

3.2 Participants, tasks and procedures

The 118 participants in the experiment are undergraduate students, recruited from an accounting course of a business studies program of a west-European university. Upon entering the computer lab, they are randomly assigned to the between-subject factor conditions. Demographic data are reported in Table 1. On average, they 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.

[Insert Table 1 about here]

In each round, division managers are responsible for an investment project. At the beginning of each period, headquarters propose a contract, which specifies a manager's compensation. The costs of the project range from 500 to 2500. Information asymmetry is present because the headquarters of the firm only know that the costs of this project range between 500 and 2500, with equal probabilities 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 headquarters observe the output value of the project. The managers need to prepare a cost report to the headquarters. A manager's payoff equals the compensation rate (set by headquarters) multiplied by the difference of output value and reported costs: $\text{manager's payoff} = \text{compensation rate} * (\text{output value} - \text{reported costs})$. 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: $\text{division's contribution to firm profit} = \text{project's payoff} - \text{manager's payoff}$. Managers face a trade-off

between lying to maximize wealth and reporting honestly. The output value and true cost for each round were randomly chosen within a certain range by the experimenter.

Each subject is assigned randomly a confidential experimental ID when they enter the lab. This experimental ID will be used for cash payment. Before they start the experimental task, subjects need to read the general instructions about the experiment. Then they give some personal background information (age, gender, nationality, work experience etc.). Subjects also need to take a pre-experiment questionnaire, which measures their social value orientation scores (SVO)⁶. Before they continue their tasks, a hypothetical example is given to help the subjects to understand the instructions better (see Appendix A). Subjects also solve seven true or false questions and two calculation questions regarding the experimental instructions. They are not allowed to continue unless they answer all questions correctly. The instructor remains in the room to answer questions from subjects.

Subjects' cash payment is based on a participation fee of €3 and the total experimental euros (EEs) they earned over all 10 periods at the conversion ratio of 500 EEs to €1. Theoretically, each participant can earn €15 if they lie to the maximum extent 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 which examines the effectiveness of the manipulations and subject's understanding about the experiment (see Appendix B for an overview of the exit questionnaire).

4. Results

4.1 Manipulation checks

In the exit questionnaire, I asked questions with regard to the effectiveness of my manipulations on a Likert scale of 1 “completely disagree” to 7 “completely agree”. Three statements (two in positive and one in negative phrasing) are used as manipulation checks. Average responses for all the three treatments are significantly different from the neutral response of 4 ($p < 0.001$). The subjects agree that their cost report behavior is influenced by (1) incentive compensation rate (mean response 5.00, $SD = 1.71$), (2) peer managers' report

⁶ SVO measure is adopted from the psychology and the economics literature (McClintock 1972; Kuhlman and Marshello 1975; Van Lange 2000). Social value orientations are measured by having people divide a *hypothetical* amount of money between themselves and a *hypothetical* other. see Appendix C for the measurement.

(mean response 5.01, SD=1.62), and (3) auditing team (mean response 4.86, SD=1.44). The results indicate that these manipulations are successful.

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

4.2 Summary statistics for dependent variable

I measure managerial honesty by a percentage metric ranging from 0 to 100%, where a higher ratio indicates a high level of honest reporting (Panel A of Table 2 gives the formula). Higher ratio indicates that participants forgo a lot of compensation by reporting a figure close to the true cost (and far from the minimum cost reporting by which they 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 1800 total reports) with the true cost⁷.

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

[Insert Table 2 about here]

The results from Table 2 show that managerial honesty is higher with 10% incentive compensation (ICI) (mean = 83.34) compared to that with 50% incentive compensation (ICI) (mean = 79.23). Under both incentive contracts, subjects seem to conform to what their peers do: they are more honest when their peers report truthfully and less honest when their peers also engage more in underreporting the true cost. The influence of peer honesty (PH) is larger under 10% ICI (78.92 vs. 88.08) compared with that under 50% ICI (75.49 vs. 83.24). With regard to audit (team) effectiveness (AE), subjects seem to be more truthful with a *less* effective audit team. In contrast with the effect of PH, the influence of AE seems larger under 50% ICI (82.08 vs. 76.47) than that under 10% ICI (84.42 vs. 82.30).

4.3 Tests of hypotheses

⁷ 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 show that the conclusions are not qualitatively affected by the adjustment.

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 ICI as a repeated measure (10% vs. 50%). ICI was counter balanced (see manipulations for details). The test shows that there is no order effect ($p > 0.6$).

[Insert Table 3 about here]

The results from Table 3 show that, for within-subjects contrast analyses, the truthfulness of reports is significantly influenced by ICI ($p < 0.05$). From the summary statistics, we know that subjects report more truthfully under 10% ICI. The results reject the null form of **H1**. Results of between-subjects analyses suggest that PH influences significantly the truthfulness of reports ($p < 0.05$). Again the summary statistics confirm that managers report more truthfully when the majority of their peers are honest. In sum, the results support **H2**. Surprisingly, in contrast to **H3**, AE is not a significant factor influencing the truthfulness of reports. Besides these main effects, consistent with **H4A**, the results also suggest the existence of an interactive effect between ICI and PH ($p < 0.1$). I find no evidence, however, supporting **H4B** about the interaction between ICI and AE. Furthermore, the results also reveal that SVO is a significant control variable when examining managerial reporting behavior ($p < 0.05$). In addition, ICI interacts with Gender ($p < 0.001$) to influence managerial honesty. To see more clearly the directional effects of these interactions, figures for selected interactive effects are presented in Panel A of Table 4. Panel B of Table 4 presents the ANOVA results for the factors of incentive in the metrics of high and low ICI.

[Insert Table 4 about here]

Figure 1 shows the interactive effect of ICI and PH on managerial reporting. PH works more effectively under low ICI than under high ICI. Under low ICI, the average managerial honest reporting is 0.22 above the mean when PH is high, while the average managerial honest reporting is 0.21 below the mean when PH is low; under high ICI, the average managerial honest reporting is 0.16 above the mean when PH is high, while the average managerial honest reporting is 0.15 below the mean when PH is low. Consistent with this result, Panel B shows that under low ICI, PH influence managerial reporting behavior significantly at $p < 0.05$; under high ICI, PH no longer shows a significant influence. Figure 2 shows the interactive effect between ICI and AE. As evidenced in regression analysis, the effect of AE on the truthfulness of reporting is not significant. The

interactive effect between ICI and AE is also negligible but it seems that AE has a larger effect under high ICI: honest reporting is 0.05 above (below) the mean when AE is low (high) under low ICI, whereas, under high ICI, honest reporting is 0.13 above (below) the mean when AE is low (high). Univariate analyses from Panel B show that AE's influence is naught under low ICI and marginally significant at $p < 0.1$ under high ICI. Figure 3 shows the interactive effect of ICI and SVO. Consistent with the theory, SVO is constant across the two levels of ICI. However, when subjects are classified as prosocials, the truthfulness of their reports is 0.32 higher than the mean; while when subjects are classified as proselves, the truthfulness of their reports is 0.14 lower than the mean. Panel B further presents that, as a personal trait measure, SVO is significant in both regressions. Figure 4 presents the interactive effects between ICI and Gender. The figure reveals that there is a significant difference of reporting behavior between male and female subjects regarding the influence of ICI. When ICI is switched from low to high, male subjects report dramatically less honest moving from 0.11 above the mean to 0.07 below the mean. When ICI is switched from low to high, female subjects report considerably more honest from 0.12 below the mean to 0.08 above the mean. Though ANOVA analysis of Panel B show that Gender has no significant effect under both ICI, 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 ICI is switched from low to high.

4.4 Sensitivity analyses

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 true cost out of total experimental rounds for each treatment (five rounds each for the two level of ICI). The full factorial ANCOVA repeated measure results remain the same as reported in Table 3 and 4, although the interaction between ICI and PH becomes a little bit weaker. In the univariate analysis, AE is insignificant.

Results based on sub-sample without outliers: Three out of 118 participants lied to the maximum extent in all experimental rounds. All of these subjects are in the high AE conditions. I performed detection tests to check whether these three observations can be

labeled as outliers.⁸ In the tests, the results indicate that these three observations are outliers. I re-performed the analyses based on the sample without these outliers (results are not tabulated). The results from the full factorial ANCOVA analysis remain materially the same. The results from the univariate analysis also stay the same although AE becomes insignificant.

Results with more control variables: work experience and accounting experience are added as extra control variables. The results remain the same and 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 round data: Data from the final experimental round may not be reliable since previous experiments show that there is “final-round” effect (subjects behave quite differently in the last experimental round)(Haan et al. 2006). The results based on four-round data are largely consistent with the results from the analysis of five-round data (results are not tabulated).

The effect of AE on sub-samples: Samples are divided into two sub-samples according to whether the participants made a dishonest report above or below the mean in the first or the second round. In low effectiveness audit setting, the honest participants (made dishonest reporting figures below the mean) show an upward trend in making dishonest report, while in high effectiveness audit setting, the dishonest report made by honest participants showed an upward trend and reached a peak in the forth round and then decreased till the last round. It seems these participant got caught and felt ashamed and then became very cautious about their reporting behavior. The dishonest participants (made dishonest reporting figures above the mean) show a quite flat trend regarding their dishonest reporting figures. It seems the audit effectiveness works partly for some participants and on average it does not show any significant effects.

⁸ A test heuristic states that an observation with a z-score greater than three should be labeled as an outlier. In a more reliable test, modified z-score test is determined based on outlier resistant estimators. The median of absolute deviation about the median (MAD) is such an estimator. The test heuristic states that an observation with a modified z-score greater than three and a half should be labeled as an outlier.

Overall, the sensitivity check shows that the evidence regarding **H1**, **H2** and **H4A** is quite robust. Furthermore, SVO and gender are significant control variables of reporting behavior, while AE on its own and in conjunction with other variables does usually not affect reporting behavior.

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 that high incentive compensation intensity (ICI) induces subject to report less truthfully, which is consistent with Bergstresser and Philippon's (2006) findings that highly "incentivized" CEOs tend to manipulate reported earnings more. High peer honesty promotes truthful managerial reporting in terms of both percentage and frequency. This suggests that peer honesty is a potential candidate to be used as a valuable tool to promote more truthful reporting under certain conditions. However, it is worth mentioning that the magnitude of honest reporting is influenced more significantly by peer behavior only when ICI is low. This provides the first clear evidence that managers trade-off behavioral (non-monetary) factors with economic incentives in making their reporting decisions. The interactive effect between incentive compensation and peer behavior is consistent with Brickley et al.'s (1997) trade-off model that the level of honesty declines as the payoff to lying increase. Under incentive-intensive contracts, the cost of making truthful report increases, so the managers are less likely to follow their peers to forgo monetary payoff. Finally, there is no conclusive evidence regarding the effect of audit effectiveness on managerial reporting behavior.

Besides these environmental variables, both personal trait and gender are found to be important control variables of managerial reporting behavior. Proself managers, classified according to SVO scores, always report less truthfully compared with prosocial managers. An interesting interaction between incentive compensation and gender shows that female managers report more truthfully under high ICI compared with that under low ICI while their male peers do the opposite. The result is consistent with previous findings (Croson and Gneezy 2004) that women are more sensitive to social cues in determining appropriate behavior than are men. For example, Andreoni and Vesterlund (2001) in a study of manipulating the cost/benefit ratio of giving money to a recipient, they find that the

behavior of men is more responsive to price changes; in contrast, women tend to equalize earnings between the two parties⁹. The interaction effect between ICI and gender indicates that men care more about wealth maximizing whereas women care equality among parties.

In sum, the results discussed above suggest a need to consider carefully the effect of incentive compensation as well as the effect of peer behaviors when designing contracts. Peer behaviors could either have a positive effect if peers behave in a desired direction or a negative effect if peers behave in an undesired direction. The effect of peer-group behavior shows the possibility of using an alternative mechanism to promote honesty in managerial reporting. Regarding the influence of audit effectiveness, I conclude that without a penalty on detection of misreporting, audit effectiveness does not promote truthful reporting. Furthermore, the results about the influence of SVO and gender on the truthfulness of reports suggest that SVO and gender should also be carefully taken into account when designing contracts and they should be considered (or further explored) in future study on managerial reporting.

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⁹ I apply their results in my paper in the sense that in the setting with 50% incentive compensation contract, managers and firm equally split the total profit; although gender is not significant under any of the contract type, we still find that female participants act more fair: they report more truthfully under 50% contract type than under 10% contract type.

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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

TABLE 2

Panel A: Measure of managerial honesty

Managerial honesty is defined as $\pi = 1 - (\sum_{i=1}^n \text{Payoff claimed} / \sum_{i=1}^n \text{Payoff available})$, where n is the total number of experimental round the participant plays in one setting; the “ $\sum_{i=1}^n \text{Payoff claimed}$ ” is the sum of payoff subjects earned by deviating from the true costs for the total experimental rounds, and the “ $\sum_{i=1}^n \text{Payoff available}$ ” is the amount that a subject could earn by lying to the maximum extent. In this setting, the formula is equivalent to $1 - \sum_1^5 (\text{true costs} - \text{reported costs}) / \sum_1^5 (\text{true costs} - 500)$, where 500 is the lowest value the manager can report.

Panel B: Summary statistics: Mean honest reporting* under three factor conditions

	ICI-Low			ICI-High		
	AE			AE		
	Low	High	Total	Low	High	Total
PH-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
PH-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: $1 - (\text{true costs} - \text{reported costs}) / (\text{true costs} - 500)$.

ICI-Low: the condition under which the manager's incentive compensation is 10% of the division's profit.

ICI-High: the condition under which the manager's incentive compensation is 50% of the division's profit.

PH-Low: the condition under which 10-25% of the peer managers' reports are honest.

PH-High: the condition under which 75-90% of the peer managers' reports are honest.

AE-High: the condition under which audit (team) effectiveness is two times as effective as that under low audit (team) effectiveness setting. For details, see text for manipulations.

TABLE 3

Full factorial analyses—GLM repeated measures

Dependent variable: honest reporting (standardized values)

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

^a Type III sum of squares are reported, F-statistics are in parenthesis.

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

Honest reporting: $1 - (\text{true costs} - \text{reported costs}) / (\text{true costs} - 500)$.

ICI: the condition under which the manager's incentive compensation is either 10% or 50% of his division's profit.

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

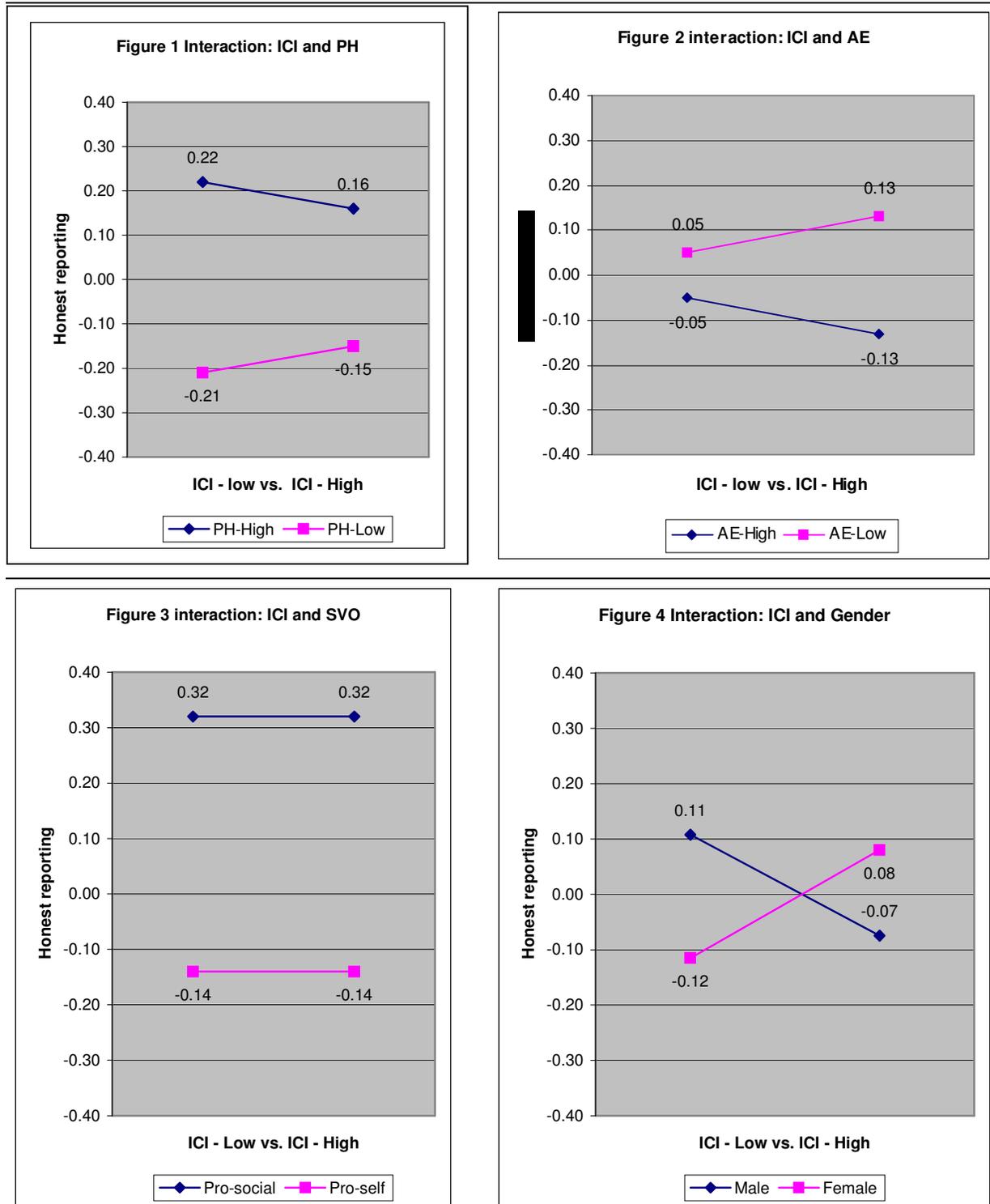
AE: equals one if the audit team is highly effective, zero if it is less effective. Where highly effective audit team is two times as effective as low effective audit team. For details, see text for manipulations.

Gender equals one if subject is male, zero otherwise.

SVO equals one when subject is classified as Proself, zero prosocial.

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% ICI

	SS ^b	df	F	Sig.
Corrected Model	12.74	5	2.74	0.02
PH	5.42	1	5.82	0.02
AE	1.03	1	1.11	0.29
PH*AE	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% ICI

	SS	df	F	Sig.
Corrected Model	11.82	5	3.13	0.03
PH	1.96	1	2.09	0.15
AE	3.05	1	3.24	0.07
PH*AE	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: $1 - (\text{true costs} - \text{reported costs}) / (\text{true costs} - 500)$.

ICI: the condition under which the manager's incentive compensation is either 10% or 50% of his division's profit.

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

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

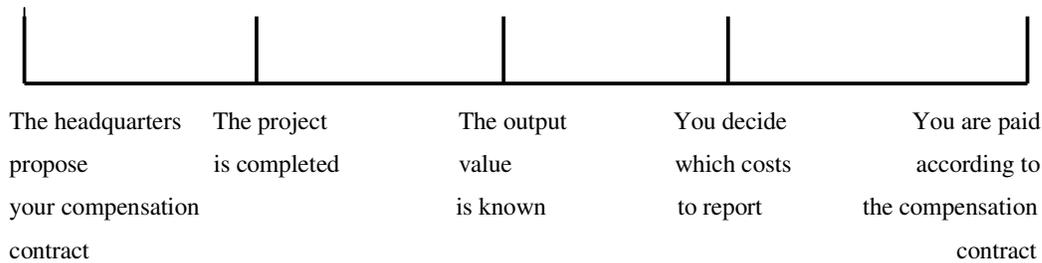
Gender: equals one if subject is male, zero otherwise.

SVO: equals one when subject is classified as prosself, zero if prosocial.

Appendix A. Overview of an experimental period

At the beginning of each period, headquarters of the corporation propose 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 know.** 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 time line demonstrates your action sequence in this experiment:



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 know that the costs could range in any value between 500 EEs and 2500 EEs with equal probabilities. **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 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 prepared the cost report to the headquarters.

In each experimental period, you will be provided about these managers' reporting decision at an average level.

[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 that the firm either:

- 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 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"
--

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	2	3	4	5	6	7
_____	_____	_____	_____	_____	_____	_____
Completely disagree			Nor agree nor disagree			Completely agree

1. The instructions were clearly formulated.
2. I was motivated to perform well in the different parts of the experiment.
3. I feel stressful 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 prepare my own cost report, I consider what other managers report.
8. I feel pressure when the audit team says my report is questionable.
9. When I make my reporting decision, the compensation rate is an important factor to consider.
10. Other managers' decisions influence my decision.
11. The compensation rate affects my cost reporting choice.
12. The audit team influences my reporting decision.
13. I don't care about the compensation rate when I make my cost reporting decisions.
14. I don't care what the audit team says.
15. I don't care what the other managers report.
16. Reporting lower than real cost would be unfair to the firm.
17. I feel guilty when I report a lower cost than real.
18. I don't care how much the headquarters get.
19. I don't feel ashamed when I deviate from the true cost.
20. I feel guilty when I am caught by audit team.

Appendix C. Measure of social value orientation

Here we set the possible allocation for each matrix. Each matrix has three allocations, the cooperative, the individualist and the competitive, always in this order. Participants choose one of the following three matrix value according to his/her preference. Finally, the score of his/her choices will be calculated and he/she is classified into prosocial (cooperative) or proself (individualist and competitive) based on the scores.

[480,480]	[540,280]	[480,80]
[500,500]	[560,300]	[500,100]
[520,520]	[580,320]	[520,120]
[490,490]	[560,300]	[500,100]
[500,500]	[560,300]	[490,90]
[500,500]	[570,300]	[500,100]
[510,510]	[560,300]	[510,110]
[500,500]	[550,300]	[500,100]
[490,490]	[540,300]	[480,100]