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Honesty in Managerial Reporting

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ABSTRACT: This study reports the results of three experiments that examine how preferences for wealth and honesty affect managerial reporting. We find that subjects often sacrifice wealth to make honest or partially honest reports, and they generally do not lie more as the payoff to lying increases. We also find less honesty under a contract that provides a smaller share of the total surplus to the manager than under one that provides a larger share, suggesting that the extent of honesty may depend on how the surplus is divided between the manager and the firm. The optimal agency contract yields more firm profit than a contract that relies exclusively on honest reporting. However, a modified version of the optimal agency contract, which makes use of subjects' preferences for honest reporting, yields the highest firm profit. These results suggest that firms may be able to design more profitable employment contracts than those identified by conventional economic analysis.

Keywords: *experiment; honesty; incentive contract; managerial reporting.*

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I. INTRODUCTION

Managerial reporting communicates vital information within firms. Managers with local information report to upper management to inform production, marketing, and capital budgeting decisions. While communication can potentially increase firm profit and the manager's welfare, agency analyses of communication (e.g., Baiman and Evans 1983; Penno 1984; Melumad and Reichelstein 1987) assume that managers' opportunistic reporting limits the value of communication.

This study examines whether managers' preferences include honesty as well as wealth, and whether managers' preferences for honesty increase the value of communication. To the extent that managers prefer to report honestly, firms may not need to limit the contracts they offer to those in which reporting truthfully maximizes the manager's wealth. Baiman and Lewis (1989, 2) examined whether preferences for honesty could increase the value of communication, noting that "many subtle but potentially important characteristics of communication are ignored in the agency model." However, they interpreted their experimental results as supporting the agency theory assumption that preferences for honesty are weak and therefore can be ignored in contracts designed to maximize firm profit.

We conduct a series of experiments to reconsider the importance of preferences for honesty. Our experiments have four objectives: (1) to reassess the empirical importance of preferences for honesty, (2) to provide evidence regarding the strengths and weaknesses of existing models of managerial reporting (i.e., communication), (3) to investigate factors that affect the extent of honest reporting, and (4) to provide evidence concerning how the extent of honesty affects firm profit.

With respect to the first objective, our findings reveal considerably more honest reporting than the conventional agency model suggests. This greater level of honesty is inconsistent with Baiman and Lewis' (1989) conclusion that preferences for honesty are too small to be important. Regarding our second objective, existing reporting models cannot explain important aspects of the reporting behavior we observe. Neither conventional agency models nor types models (Koford and Penno 1992) can explain reports that are "partially honest," i.e., reports that are neither purely wealth-maximizing nor purely honest. "Trade-off models," in which individuals trade off utility for wealth and disutility for lying (Brickley et al. 1997; Luft 1997) can potentially explain the existence of partially honest reports. To date, however, such trade-off models offer only limited guidance concerning the extent of partially honest reports.

Our third objective is to investigate factors that influence the extent of honesty. Brickley et al.'s (1997) trade-off model predicts that the level of honesty will decline as the payoff to lying increases. Our experimental results reveal little evidence of such a relation, suggesting instead that reporting may depend on how the contract divides the total surplus between the manager and the firm.

Our fourth objective is to assess how reporting behavior affects firm profit. We compare firm profit under alternative contracts that employ a reporting feature (i.e., reliance on honest reporting) and/or a production feature (i.e., dependence of the level of production on the manager's report). Our results confirm the agency theory prediction that a contract with the production feature yields more firm profit than a contract with only the reporting feature. However, as we demonstrate later in the paper, the difference in profit between the two contracts is smaller than the difference agency theory predicts. Further, while agency theory assumes that there is no value to adding the reporting feature to a contract that already incorporates the production feature, we demonstrate that firm profit increases when the contract employs both features. This finding suggests that the reporting feature, which relies exclusively on managers' preferences for honesty, can increase firm profit.

Finally, our results suggest that further research on individual reporting has considerable potential to improve contract design. The conventional agency model of reporting is simple, tractable, and captures the important influence of self-interest. However, our results suggest that honesty also plays an important role in reporting behavior. Overall, our results suggest an expanded view of managerial reporting that encompasses the effect of honesty on firm profit and recognizes that the extent of honesty may depend on how a contract divides the total surplus between the manager and the firm. Therefore, firms may be able to design employment contracts that are more profitable than those suggested by conventional economic analyses.

II. BACKGROUND

Virtually all ethical systems encourage honesty (Murphy 1993), in part to increase efficiencies and thus the total surplus (Arrow 1974; Noreen 1988). Kohlberg's (1969, 1981) theory of moral reasoning addresses how individuals internalize ethical behavior and suggests why individuals may prefer honesty. Although the economics literature has recognized individuals' preferences for factors in addition to wealth (e.g., Becker 1993; Jensen and Meckling 1994), formal economic models have only recently begun to include such preferences (e.g., Bolton 1991; Rabin 1993; Fehr and Schmidt 1999; Bolton and Ockenfels 2000).

This study investigates the role of honesty in a reporting setting in which local managers have superior information that headquarters needs to make efficient operating decisions. Organizations typically address such problems via their budgeting system. Previous experimental studies of such settings include Young (1985), Waller (1988), Chow et al. (1988), Waller and Bishop (1990), Chow et al. (1991), and Chow et al. (1994, 1995). While these studies have made important contributions to the budgeting literature, Waller (1994) and Young and Lewis (1995) suggest that further progress requires testing established economic theories and developing new theories that integrate behavioral and economic factors (see also Kachelmeier 1994, 1996; Luft 1997; Moser 1998). The current study adopts this approach.

Baiman and Lewis (1989) examine whether subjects experience disutility from lying. They interpret their results as indicating that each individual has a personal honesty threshold. Up to the threshold, the individual will report honestly; but once the threshold is reached, the individual will report to maximize his wealth. Baiman and Lewis (1989) conclude that this threshold is typically quite low, i.e., most individuals will lie for a payoff as small as \$0.25. Consequently, Baiman and Lewis (1989) conclude that the assumed wealth-maximizing behavior in models of managerial reporting is appropriate.

Antle and Eppen (1985) and Antle and Fellingham (1995) examine how to elicit and use managers' private information most efficiently when the firm can adjust the level of production based on the manager's report. They employ the standard economic assumption that managers report to maximize their utility for wealth. The contract they identify as maximizing firm profit includes a production hurdle. It calls for production when the reported cost is low (at or below the hurdle) and no production when the reported cost is high (above the hurdle). The firm uses the manager's report only to determine whether there is production, but not as a measure of the resources to be transferred to the manager when there is production.

III. EXPERIMENTS

We conduct three experiments designed to examine managerial reporting and firm profitability in a budgeting setting. Subjects act as managers who privately observe the cost of

production. Based on the manager's cost report, the firm provides the manager with resources. Managers can obtain excess resources by lying (overstating the actual production cost). Managers know that if they lie, their lies cannot be detected because the experimental setting precludes monitoring, auditing, or reputation effects.

Experiment 1: Trust Contract (TC)

Overview

Experiment 1 examines a setting in which the manager faces a direct trade-off between lying to maximize wealth and reporting honestly. That is, the more the manager lies, the more he earns, and the less he lies, the less he earns. Thus, the experiment provides a direct test of the relation between monetary incentives to lie and reporting behavior. Because the manager knows the actual cost for certain when making his cost report, risk aversion plays no role in the reporting decision. Likewise, there are no intervening complications such as how the manager's skill or productive effort affects production or the total surplus. Avoiding such complications is consistent with calls for simpler and sharper empirical tests comparing predictions from the conventional economic model to alternative hypotheses (Young and Lewis 1995; Luft 1997).

We refer to the contract used in Experiment 1 as the Trust Contract (TC) because the firm transfers to the manager whatever amount he requests. Because any payoff the manager claims reduces the firm's profit, the manager's report directly determines how the available payoff is divided between the manager and the firm.

Procedures

Twenty-eight M.B.A. students each assumed the role of a division manager who reports his private production cost to corporate headquarters in the form of a budget request. When the division manager was hired, both the manager and corporate headquarters knew the probability distribution of the division's uncertain costs. After beginning work on the job, but before submitting his budget request for that period, the manager's private forecasting system reliably determined exactly what the actual production costs would be for the coming period. Corporate headquarters, in contrast, knew only the probability distribution of possible production costs.

Managers submitted a budget request and kept any difference between the resources received from corporate headquarters and the actual production cost. In addition to keeping the excess of the budget request over the actual cost, subjects also received a salary of 250 Lira per period (30 Lira = \$1.00). Corporate headquarters never learned whether the manager's budget request was equal to the actual production cost (i.e., whether the manager reported his actual production cost honestly).

The firm sold 1,000 units of output for 6.00 Lira per unit. Actual production costs fell within the range of 4.00 Lira to 6.00 Lira per unit, and were randomly drawn from a set of 41 equally likely costs (4.00, 4.05, 4.10, ..., 6.00). The instructions provided several examples of how various budget requests would affect the manager's personal earnings and the division's contribution to firm profit. In addition, subjects received a comprehensive earnings spreadsheet that showed their personal earnings and their division's contribution to firm profit for all possible combinations of actual costs and budget requests.

The experiment consisted of ten independent periods. At the start of each period, each subject privately learned his or her actual cost per unit for that period. To expedite the experiment, we randomly determined the actual costs in advance. We randomly drew ten actual costs per unit (with replacement) from the set of possible costs (4.00, 4.05, 4.10, ..., 6.00). We repeated this procedure 28 times, generating 28 independent sets of ten actual costs per unit (one set for each of the 28 subjects).

After we read the instructions aloud and answered all questions, each subject randomly selected an envelope containing his or her confidential participant number and a set of ten budget request forms sequentially ordered from period 1 to 10. Each budget request form provided the randomly determined actual cost per unit for the current period. In addition, each form provided a table showing the subject's personal earnings and his/her division's contribution to firm profit for each possible budget request the subject could make. Subjects recorded on the form their budget request for the current period, their corresponding per-

actual cost. The rationale for this adjustment is that our study focuses on the trade-off between wealth and honesty, and reports of costs that are less than actual costs are inconsistent with any combination of preferences for wealth and honesty. Because the adjustment results in a *lower* percentage of honesty (π) and *lower* firm profit, it ensures that the amount of honesty included in our analysis is not inflated by cost reports that were less than the actual cost. Moreover, our statistical conclusions are unaffected by the adjustment except in one case, and for that case we report results for both the adjusted and unadjusted data and explain why the results differ.

Conventional agency model. The conventional agency model assumes that individuals experience no disutility from lying. Thus, the agency model predicts subjects will always claim the entire payoff available; and hence π is expected to be 0% for all reports. In contrast to this prediction, Panel A of Table 1 shows that the percentage of honesty (π) in Experiment 1 is 48.7%, and that the mean and maximum payoffs that subjects gave up by making honest or partially honest reports were \$16.07 and \$61.67, respectively.² The high percentage of honesty and the large dollar payoffs subjects gave up are clearly inconsistent with the conventional agency model's prediction of wealth-maximizing reporting.³

Moreover, if subjects had reported to maximize their wealth, then their reports should be unrelated to their actual production costs because they would have always reported 6.00 Lira. To test this prediction, we regressed subjects' reported costs on their actual costs. Contrary to the prediction of no relation, we find a significant positive association ($\beta = +0.450$, $p < 0.001$) between reports and actual costs.⁴ This finding is consistent with subjects having a preference for honesty, but inconsistent with wealth-maximizing reporting or with random reporting, both of which imply no correlation between actual and reported costs.

Additional evidence that preferences for honesty affected subjects' reports comes from a comparison of the results of Experiment 1 with the experimental results for dictator games. A subject's reporting decision in Experiment 1 is economically equivalent to a subject's decision in a dictator game, in which the subject (dictator) decides how to divide a fixed payoff with another party. In dictator games with settings like Experiment 1, in which the dictator never meets or even sees the other party, the dictator gives, on average, about 18% of the total amount available to the other party and keeps about 82% for himself (Bohnet and Frey 1999; Bolton et al. 1998; Eckel and Grossman 1996; Forsythe et al. 1994; Hoffman et al. 1994).⁵ Despite its economic equivalence to a dictator game, Experiment 1 is behaviorally quite different because subjects must lie to get more of the payoff, a feature not present in dictator games. Thus, subjects' preferences for honesty apparently cause them to give more of the available payoff to the other party in Experiment 1 (48.7%) than in anonymous dictator games (18%).

² Possible payoffs range from \$0 to \$66.67, where the \$66.67 payoff results from an actual cost of 4.00 Lira per unit, a reported cost of 6.00 Lira per unit, production of 1,000 units and a conversion rate of \$1 per 30 Lira.

³ Mean reported costs are approximately the same across the ten experimental periods for this and all subsequent experiments, indicating that subjects did not lie more as they gained experience with the task.

⁴ Results are for the regression model: Reported Cost = $\alpha + \beta$ Actual Cost, with the error term adjusted for repeated measures across the 28 subjects. The analysis included all observations except six cases with an actual cost of 6.00 in which there is no payoff available from lying, producing a sample of $n = 280 - 6 = 274$. Because the range of the dependent variable is bounded at 4.00 and 6.00, we repeated the analysis using two-sided censored regressions (tobits), and the results are substantively the same ($\beta = +0.505$, $p < 0.001$).

⁵ In "anonymous" dictator games, the dictator never meets nor sees the other player. The percentage (18%) is an unweighted average of the results of anonymous dictator games reported in the five studies cited in the text. Mean percentages given to the other player in these studies ranged from 9.6% to 26%.

TABLE 1
Percentage of Honesty, Payoff Forgone and Report Types under the Trust, High Payoff Trust, and Modified Trust Contracts

Panel A: All Observations			
	Experiment 1	Experiment 2	Experiment 3
	Trust Contract (TC)	High-Payoff Trust Contract (HPTC)	Modified Trust Contract (MTC)
	n = 280	n = 110	n = 280
Percentage of Honesty ^a (π)	48.7%	42.9%	NA
Payoff Forgone ^b			
Mean (\$)	\$16.07	\$ 68.63	NA
Maximum (\$)	\$61.67	\$291.67	NA
Report Types ^c			
Economic ($\pi = 0\%$)	27%	29%	NA
Honest ($\pi = 100\%$)	25%	21%	NA
Other ($0\% < \pi < 100\%$)	48%	50%	NA
Panel B: Actual Cost ≤ 5.00			
	n = 142	n = 55	n = 142
Percentage of Honesty ^a (π)	47.7%	41.0%	21.8%
Payoff Forgone ^b			
Mean	\$23.81	\$100.00	\$ 3.61
Maximum	\$61.67	\$291.67	\$31.67
Report Types ^c			
Economic ($\pi = 0\%$)	22%	18%	61%
Honest ($\pi = 100\%$)	16%	9%	16%
Other ($0\% < \pi < 100\%$)	62%	73%	23%
Panel C: Actual Cost > 5.00			
	n = 138	n = 55	n = 138
Percentage of Honesty ^a (π)	52.0%	49.1%	NA
Payoff Forgone ^b			
Mean	\$ 8.12	\$ 37.27	NA
Maximum	\$31.67	\$150.00	NA
Report Types ^c			
Economic ($\pi = 0\%$)	33%	40%	NA
Honest ($\pi = 100\%$)	33%	33%	NA
Other ($0\% < \pi < 100\%$)	34%	27%	NA

^a The percentage of honesty (π) is calculated as $1 - (\sum_{i=1}^n \text{Payoff Claimed}_i / \sum_{i=1}^n \text{Payoff Available}_i)$. That is, π is 1 minus the ratio of payoff claimed for all observations divided by payoff available. However, in Experiment 3 when the actual cost > 5.00 , the payoff available is zero, and hence π is not defined. Therefore, for Experiment 3 we report data for actual cost ≤ 5.00 only (Panel B) and show NA (Not Applicable) in Panels A and C because the payoff available is zero for all observations in Panel C and for some observations in Panel A.

^b Payoff forgone is the amount of additional profit that the subject could have received by lying to the maximum (i.e., the difference between the payoff available and the payoff claimed).

^c We categorize each report as economic ($\pi = 0\%$), honest ($\pi = 100\%$), or other ($0\% < \pi < 100\%$) based on the percentage of payoff available the report claimed. The percentage of each type of report is reported in the table.

Threshold model. Baiman and Lewis' (1989) threshold model assumes that because individuals experience a small fixed disutility from lying, they report honestly for all payoffs less than their personal disutility threshold and report to maximize wealth for all payoffs at or above the threshold. The last row of Panel A of Table 1 shows that in Experiment 1, 48 percent of subjects' reports were partially honest, i.e., these reports resulted in the subject's receiving some, but not all, of the payoff available from lying. That is, approximately one-half of the reports in Experiment 1 are inconsistent with the threshold model's prediction that subjects will either report honestly or report to maximize wealth.

Types model. The high percentage of partially honest reports in Experiment 1 is also inconsistent with Koford and Penno's (1992) types model, in which agents are one of two types: "ethical" (fully honest) or "economic" (willing to tell any lie necessary to maximize wealth). Ethical types never lie because they experience infinite disutility from lying, whereas economic types always lie to maximize their wealth because they experience no disutility from lying (as in the conventional agency model). In Experiment 1, 18 percent of the subjects always reported to maximize their wealth (i.e., $\pi = 0\%$ in every period), 7 percent always reported honestly (i.e., $\pi = 100\%$ in every period), and the remaining 75 percent made partially honest reports in some or all periods. Corresponding analyses for Experiments 2 and 3 show that the results for individual *subjects* (not reported) parallel the results for individual *reports* (see Table 1). Thus, for Experiments 2 and 3 we report results on an individual report basis only.

Experiment 2: High Payoff Trust Contract (HPTC)

A potential limitation of Experiment 1 is that the payoffs to lying ranged from \$0.00 to \$66.67, depending on the actual cost draw. While these payoffs are high relative to those used in most experimental economics studies, higher payoffs might lead to less honest reporting. Accordingly, we conducted Experiment 2, which was identical to Experiment 1 except that the dollar payoffs for lying were increased by a factor of 5. Thus, the maximum payoff for lying under Experiment 2 was \$333.33 as opposed to the maximum of \$66.67 under Experiment 1. We refer to the contract used in Experiment 2 as the High Payoff Trust Contract (HPTC). To control cost, we limited Experiment 2 to 11 subjects.

Results

As in Experiment 1, subjects' post-experimental questionnaire responses indicated that they understood the experimental task and procedures. All subjects understood that their responses were anonymous and that the firm would never learn whether they were honest. In addition, all subjects understood that their earnings for any period were not affected by either their earnings for any other period or their division's contribution to firm profit.

Panel A of Table 1 shows that the percentage of honesty (π) in Experiment 2 was 42.9%, and that the mean and maximum payoffs forgone by making honest or partially honest reports were \$68.63 and \$291.67, respectively (of a possible range from \$0 to \$333.33).⁶ As in Experiment 1, these results are clearly inconsistent with the conventional agency model's prediction that there will be no honesty in reporting ($\pi = 0\%$). Also, as in Experiment 1, a regression of reported costs on actual costs reveals a significant positive relation ($\beta = +0.340$, $p < 0.03$), suggesting that it is subjects' preference for honesty that

⁶ In Experiment 2, one reported cost was less than the actual cost. The results reported in the paper include that report after it was replaced with the actual cost as in Experiment 1.

causes them to deviate from wealth-maximizing reporting. Finally, the percentage of partially honest reports in Experiment 2 (50 percent) is very similar to that in Experiment 1 (48 percent), demonstrating again that neither Baiman and Lewis' (1989) threshold model nor Koford and Penno's (1992) types model can fully explain subjects' reporting behavior.

Trade-off model. While the conventional agency, threshold, and types models described above assume either no disutility, a small fixed disutility, or infinite disutility from lying, a more general economic perspective (e.g., Brickley et al. 1997) suggests that individuals will trade off ethical behavior with the monetary payoff for unethical behavior. In our setting, this means individuals will lie more as the payoff to lying increases.

To test whether subjects lied more when the payoff to lying increased, we pooled the data from Experiment 2 (HPTC) and Experiment 1 (TC) because these two experiments were identical except that the dollar payoffs were five times greater in Experiment 2. Using the pooled data, we regressed the percentage of honesty (π) on three variables: the payoff available from lying (in Lira), a dummy variable for the HPTC, and the payoff available from lying interacted with the HPTC dummy.⁷ Neither the HPTC dummy nor the interaction term was statistically significant ($p > 0.96$ and $p > 0.64$, respectively), indicating that the fivefold increase in payoffs did not produce more lying in Experiment 2 than in Experiment 1. Furthermore, the payoff available from lying had no significant effect ($p > 0.44$) on the percentage of honesty, which, together with the insignificant interaction term, indicates that subjects did not lie significantly more when the payoff to lying increased within either experiment. Thus, we find no evidence that subjects lied significantly more as the payoff to lying increased either across or within Experiments 1 and 2.⁸

Our first two experiments focus on reporting behavior. However, reporting behavior directly affects firm profit, and conventional economic analysis of managerial reporting settings derives contracts that maximize firm profit. Because in our setting such contracts include a production feature, our third experiment examines reporting behavior and firm profit under a contract that incorporates both reporting and production features.

Experiment 3: Modified Trust Contract (MTC)

Background

Antle and Eppen (1985) and Antle and Fellingham (1995) show that in settings like ours, the optimal contract from an agency-theory perspective includes a production hurdle, i.e., a cost above which there is no production. We refer to this contract as the Hurdle Contract (HC). Given our experimental parameters, the optimal HC sets the production hurdle at 5.00 Lira per unit, meaning that there is no production or transfer of resources to

⁷ We adjusted error terms for repeated measures across the 39 subjects. The analysis included all observations except nine cases with an actual cost of 6.00 in which there is no payoff available from lying, producing a sample of $n = 280 + 110 - 9 = 381$. The dependent variable is the percentage of honesty (π) for each observation. Because the range of the dependent variable is bounded at 0.0 and 1.0 when using the adjusted data, we also ran a two-sided censored regression (tobit), which yields the same conclusions as those reported in the paper.

⁸ Repeating the regression analysis using the unadjusted data (including reports of less than actual costs) yields the same statistical inferences, except that the effect of payoff available from lying is marginally significant ($p = 0.09$). However, this result is *not* due to subject's lying more as the payoff to lying increased. Rather, it reflects the fact that almost all reports of costs less than actual costs occurred when the payoff to lying was low. That is, reports of costs less than the actual cost were not random, but instead almost always occurred when the distribution of the total surplus was very unfavorable to the firm. In these cases, subjects claimed none of the payoff available to them for lying, and even gave the firm some of the payoff they could have had by reporting honestly, so that $\pi > 100\%$. Consequently, our conclusions regarding the effect of payoff available on the extent of lying are the same whether the statistical analysis is based on the adjusted or unadjusted data.

the manager when the manager reports a cost greater than 5.00 Lira per unit.⁹ For any

Results

As in Experiments 1 and 2, subjects' post-experimental questionnaire responses indicated that they understood the experimental task and procedures. All subjects understood that their responses were anonymous, and 96 percent of the subjects understood that the firm did not know whether they were honest. In addition, 92 percent understood that their earnings for any period were not affected by their earnings for any other period, and 96 percent understood that their earnings were unaffected by their division's contribution to firm profit.

Reporting behavior. Reporting behavior in Experiment 3 is interesting only for cost draws ≤ 5.00 , because for cost draws > 5.00 managers do not face a trade-off between reporting to maximize wealth and reporting honestly. For cost draws > 5.00 , subjects maximize their wealth by reporting honestly. Therefore, for Experiment 3, we report data only for cost draws ≤ 5.00 (Table 1, Panel B) and base our analysis exclusively on these reports.

As in Experiments 1 and 2, subjects' reporting behavior under the MTC ($\pi = 21.8\%$) is *inconsistent* with the conventional agency model prediction that $\pi = 0\%$.¹¹ Furthermore, the mean and maximum payoffs that subjects gave up by making honest or partially honest reports are \$3.61 and \$31.67, respectively (of a possible range from \$0 to \$33.33). Also, as was the case for the first two experiments, there is a significant positive relation ($\beta = +0.149$, $p < 0.04$) between reported costs and actual costs, suggesting that preferences for honesty influenced subjects' reports. Finally, as in Experiments 1 and 2, the partially honest reports under the MTC (23 percent, from Panel B of Table 1) are inconsistent with Baiman and Lewis' (1989) threshold model and Koford and Penno's (1992) types model.¹²

Despite the similarities across experiments described above, a closer comparison reveals that the production hurdle under the MTC led subjects to report less honestly than they did under the TC or HPTC. Specifically, subjects reported less honestly under the MTC ($\pi = 21.8\%$) than they did for the same cost draws (from Panel B of Table 1) under either the TC ($\pi = 47.7\%$, $F = 9.04$, $p < 0.01$) or the HPTC ($\pi = 41.0\%$, $F = 6.25$, $p < 0.02$).¹³ To our knowledge, no existing reporting model predicts this increase in the extent of wealth-maximizing behavior in response to the hurdle feature. A potential explanation for the lower

¹¹ The results reported in Panel B of Table 1 for actual costs ≤ 5.00 include six cases in which the subject reported a cost less than the actual cost. As in Experiments 1 and 2, we replaced these costs with the corresponding actual cost. For actual costs > 5.00 in Panel C of Table 1, there were 34 reports of costs less than the actual cost. Although these reports do not affect our reported results, they are neither random errors nor do they appear to result from subjects misunderstanding the task. Rather, subjects appear to have knowingly sacrificed their own wealth to boost firm profit by ensuring that production would take place. All such reports were 5.00 Lira, the amount that minimized the cost to the subject (i.e., manager) of increasing firm profit by enabling production. Such reports occurred most often when the actual cost was only slightly above 5.00, again suggesting that subjects were most likely to report to increase firm profit when the cost to them was minimal.

¹² Although there are partially honest reports in all three experiments, the proportion of such reports (from Panel B of Table 1) under the MTC (23 percent) is smaller than under either the TC (62 percent, $\chi^2 = 43.6$, $p < 0.01$) or the HPTC (73 percent, $\chi^2 = 41.6$, $p < 0.01$). The proportion of such reports under the TC is not different from that under the HPTC ($\chi^2 = 2.0$, $p > 0.20$).

¹³ The statistics for the comparisons reported in the text, as well as for the additional comparisons reported below, are based on regressions like those used to analyze the pooled data discussed in conjunction with the results of Experiment 2. The comparisons could be affected by the fact that the payoff available from lying is smaller under the MTC than under the TC or HPTC because of the hurdle feature in the MTC (i.e., because of the hurdle, the payoff available under the MTC ranges from 0 to 1,000, as compared to a range of 0 to 2,000 under the TC or HPTC). Therefore, we also consider alternative comparisons that hold constant the range of the payoff available from lying at 0 to 1,000 by comparing results for cost draws ≤ 5.00 under the MTC to results under the TC and HPTC for cost draws > 5.00 . These comparisons again confirm that subjects reported less honestly under the MTC ($\pi = 21.8\%$ from Panel B of Table 1) than under the TC ($\pi = 52.0\%$ from Panel C of Table 1, $F = 9.83$, $p < 0.03$) or the HPTC ($\pi = 49.1\%$ from Panel C of Table 1, $F = 4.76$, $p < 0.04$).

level of honesty under the MTC is that the hurdle feature provided subjects with less of the total surplus and the firm with more.¹⁴

To illustrate the difference between the distribution of the total surplus under the MTC (Experiment 3) vs. the TC (Experiments 1 and 2), assume that the actual cost is 4.00 Lira per unit and the percentage of honesty is $\pi = 50\%$. Under the TC, the manager would receive 1,250 Lira (transfer of 5,000 plus salary of 250 less 4,000 used for production), which is 62.5 percent of the total surplus. The firm would receive 750 (revenue of 6,000 less transfer of 5,000 and salary of 250), which is 37.5 percent of the total surplus. In contrast, given the same actual cost and percentage of honesty under the MTC, the manager would receive only 750 (transfer of 4,500 plus salary of 250 less 4,000 used for production), which is 37.5 percent of the total surplus, while the firm would receive 1,250 (revenue of 6,000 less transfer of 4,500 and salary of 250), which is 62.5 percent of the total surplus. This pattern, in which the manager's share of the total surplus for a given level of honesty is smaller under the MTC than under the TC, holds for all actual costs for which there is a payoff available for lying. Therefore, the lower percentage of honesty under the MTC ($\pi = 21.8\%$) vs. the TC ($\pi = 48.7\%$) and the HPTC ($\pi = 42.9\%$) appears to result from subjects lying more under the MTC to achieve a more favorable distribution of the total surplus.¹⁵

Further evidence that reporting under the MTC differed from that under the TC comes from a regression of the percentage of honesty of individual subject reports under the MTC (π) on the payoff available from lying. This analysis reveals a marginally significant reduction in the percentage of honest reporting ($\beta = -0.207$, $p = 0.065$) as the payoff to lying increases. As we found no such relation in the first two experiments, the unfavorable distribution that managers faced under the MTC appears to have led them to engage in a greater degree of wealth-maximizing reporting.

Figure 1 provides an additional perspective on how reporting varied across contracts by plotting the mean lie for each actual cost draw (4.00, 4.05, ..., 6.00) under the TC, HPTC, and MTC contracts in Panels A, B, and C, respectively. Each panel in Figure 1 shows the Economic Prediction, which is the mean lie the conventional agency model predicted for each cost draw. For example, for an actual cost draw of 5.00 in Panel A under the TC, the Economic Prediction is a lie of 1.00 because the conventional agency model predicts that the manager will report 6.00. The plot of Actual Lies in each panel shows the actual mean lie for each actual cost draw.

The three panels of Figure 1 reveal patterns of reporting that are consistent with our previous conclusions. First, on average, subjects reported so as to receive some, but not all, of the total available payoff. Second, consistent with less honesty under the MTC, the plot of Actual Lies falls closer to the Economic Prediction line under the MTC (Panel C) than under either the TC (Panel A) or the HPTC (Panel B). Next, we relate the observed reporting patterns under the different contracts to firm profit for these contracts.

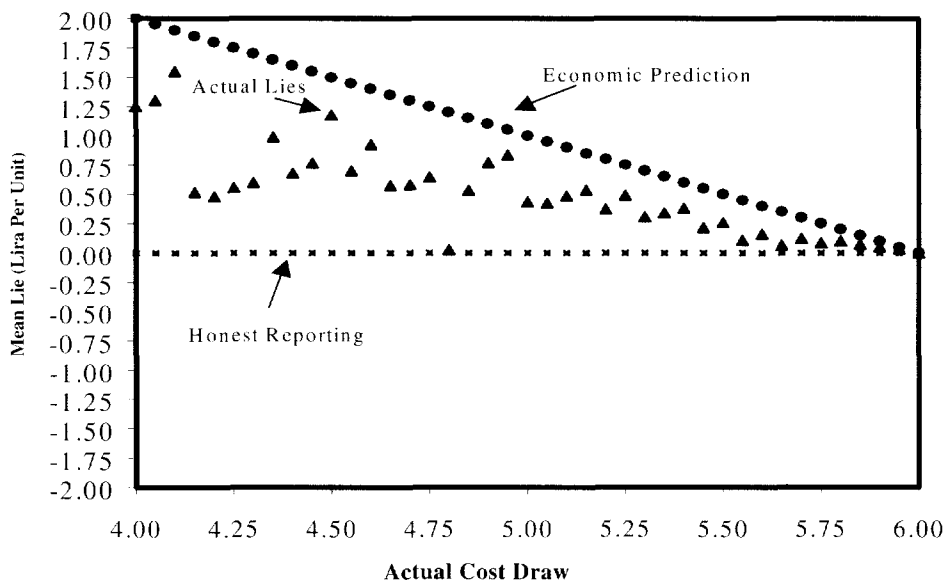
Firm profit. Firm profit in our experiments depends on three factors: (1) the manager's contract; (2) how honestly the manager reports; and (3) the actual cost realizations. To focus on the first two factors, we eliminate the effect of actual cost realizations by replacing

¹⁴ We use "total surplus" to refer to the sum of the manager's and firm's total payoffs as distinguished from the "payoff available" which we use to describe the maximum payoff available to the manager for lying.

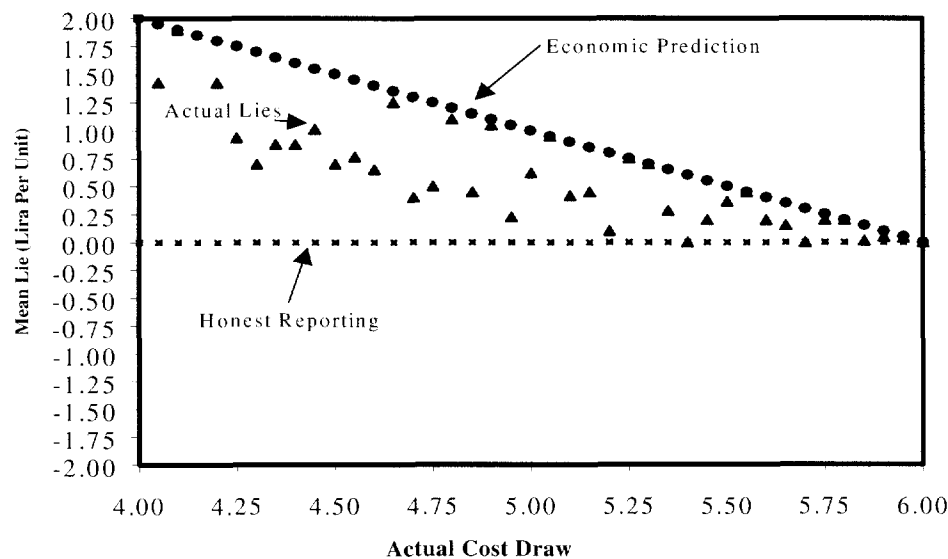
¹⁵ Fehr and Gächter (2000) propose a similar argument for why a manager would reduce the level of his productive effort when faced with an incentive contract structured to deliver all or almost all of the available surplus to the principal and little or none to the manager.

FIGURE 1
Mean Lies by Actual Cost Draw for the Trust, High Payoff Trust, and Modified Trust Contracts^a

Panel A: Mean Lie by Actual Cost Draw for Trust Contract (TC)



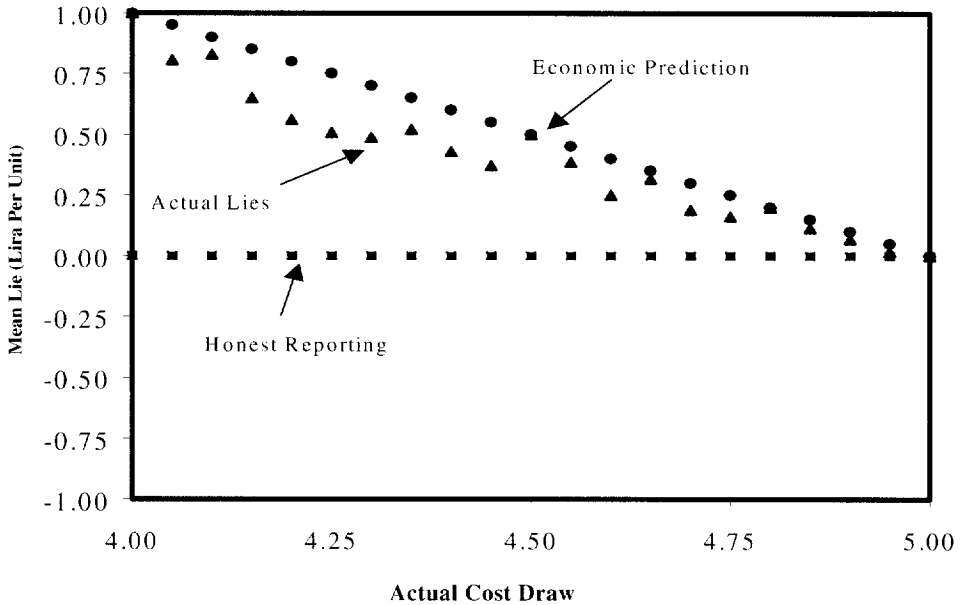
Panel B: Mean Lie by Actual Cost Draw for High-Payoff Trust Contract (HPTC)



(Continued on next page)

FIGURE 1 (Continued)

Panel C: Mean Lie by Actual Cost Draw for Modified Trust Contract (MTC)

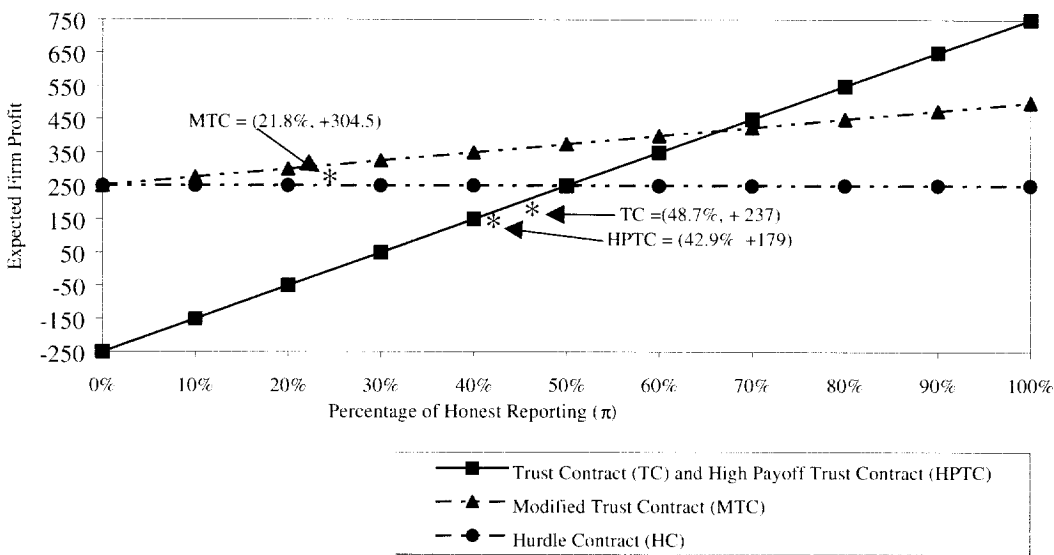


^a "Mean Lie" is the mean value of (Reported Cost - Actual Cost), averaged over all cases of a specific cost draw. For example, under the TC, the actual cost draw was 5.00 in nine cases, and for those cases, the mean lie was 0.43 Lira.

actual costs with the expected cost. Each contract's expected profit is then uniquely determined by the percentage of honest reporting (π) under that contract, as derived in the Appendix. That is, under the TC and HPTC, expected profit = $-250 + 1000\pi$, while under the MTC, expected profit = $250 + 250\pi$.

Figure 2 plots the resulting expected firm profit functions for each contract as the percentage of honesty (π) increases from 0% to 100%. The figure illustrates several important relations. First, for the standard economic assumption of wealth maximizing reporting ($\pi = 0\%$), the HC and MTC contracts both yield expected profit of +250 vs. an expected loss under the TC of -250. However, for any positive percentage of honesty ($\pi > 0\%$), expected profit under the MTC ($250 + 250\pi$) exceeds that under the HC (+250), illustrating that the MTC's reporting feature always increases firm profit for any positive percentage of honesty. Further, with sufficient honesty ($\pi > 50\%$), expected profit under

FIGURE 2
Expected Firm Profit as a Function of the Percentage of Honest Reporting



- * = Expected firm profit for actual percentage of honest reporting observed in experiments.
- 1. TC = (48.7%, +237) indicates that 48.7% is the actual percentage of honesty (π) and +237 is the expected firm profit per subject under the Trust Contract (TC). Expected firm profit is the value of the profit function for the TC from the Appendix, given the actual percentage of honesty as follows: $-250 + 0.487 \times (1,000) = +237$.
 - 2. HPTC = (42.9%, +179) indicates that 42.9% is the actual percentage of honesty (π) and +179 is the expected firm profit per subject under the High Payoff Trust Contract (HPTC). Expected firm profit is the value of the profit function for the HPTC from the Appendix, given the actual percentage of honesty as follows: $-250 + 0.429 \times (1,000) = +179$.
 - 3. MTC = (21.8%, +304.5) indicates that 21.8% is the percentage of honesty (π) and +304.5 is the expected firm profit per subject under the Modified Trust Contract (MTC). Expected firm profit is the value of the profit function for the MTC from the Appendix, given the actual percentage of honesty as follows: $250 + 0.218 \times (250) = +304.5$.

expected total surplus), and (2) distributing a greater percentage of this larger expected total surplus to the firm. In contrast, the expected total surplus under the MTC (750) is identical to that under the HC (750), and thus the only way the MTC can achieve greater firm profit than the HC is by distributing a greater percentage of this fixed total surplus (750) to the firm.¹⁶ While a benefit of the TC is greater total surplus, a corresponding cost is greater exposure to opportunistic reporting by the manager. That is, the firm's expected

¹⁶ Because production always takes place under the TC, the expected total surplus of 1,000 under the TC is calculated as total revenue of 6,000 Lira less expected total cost of 5,000 (5.00 Lira per unit \times 1,000 units). Because production takes place only when the actual cost \leq 5.00 under the HC and the MTC, the expected total surplus of 750 under the HC and the MTC is calculated as $0.5(6,000 - 4,500) + 0.5(0) = 750$. The first 0.5 is the probability of a cost draw less than or equal to 5.00, and the quantity (6,000 - 4,500) is 6,000 total revenue less the corresponding expected cost of 4,500. The second 0.5 is the probability of a cost draw greater than 5.00, and the quantity (0) is the corresponding total surplus when there is no production. Under both the TC and the MTC, the distribution of the total surplus between the manager and the firm depends on how honestly the manager reports.

profit can be as low as -250 under the TC if the manager reports to maximize his wealth ($\pi = 0\%$), while the hurdle feature of the MTC ensures that the firm's expected profit cannot fall below $+250$.

We evaluate the expected profit relations depicted in Figure 2 using the actual percentage of honesty (π) observed under each contract. Figure 2 shows the actual percentage of honesty (π) and the corresponding expected firm profit for each contract as an asterisk “*”.¹⁷ We note several important findings. First, the comparison of expected firm profits across contracts given the conventional agency assumption of $\pi = 0\%$ does not apply because the actual percentage of honesty is well above zero for all contracts. Second, given the actual percentage of honesty of $\pi = 48.7\%$ under the TC, expected firm profit under the HC ($+250$) exceeds that under the TC ($+237$). However, this 13-Lira difference in expected firm profit is much smaller than the 500 Lira difference that agency theory predicts based on the assumption that $\pi = 0\%$. As a result, a relatively small increase in honesty under the TC would produce greater expected profit under the TC than under the HC. Firm policies that increase manager loyalty could potentially produce the increase in honesty necessary for firm profit under the TC to exceed that under the HC. Alternatively, other benefits associated with the TC might outweigh the small difference in firm profit. For example, the higher manager payoffs generated by the TC may result in increased worker effort or in lower worker turnover (Akerlof 1982, 1984; Shapiro and Stiglitz 1984; Stiglitz 1974).

Given the actual levels of honesty under each contract, expected firm profit with both the reporting and hurdle features under the MTC ($+304.5$) exceeds the expected profit with only the reporting feature under the TC ($+237.0$), as well as the expected profit with only the hurdle feature under the HC ($+250.0$). The MTC achieves greater expected profit despite having less honesty (21.8%) than under the TC (48.7%). While the MTC's hurdle feature results in less honesty than under the TC, it also reduces transfers to the manager, so that expected firm profit is greater by 67.5 Lira under the MTC than under the TC. The fact that the MTC's combination of reporting and a production hurdle yields greater expected firm profit than either the TC, which has reporting but no production hurdle, or the HC, which has a production hurdle but no reporting, demonstrates that both the reporting feature and hurdle feature are valuable. As noted earlier, by design, firm profit under the MTC will always be at least as great as under the HC. Nevertheless, our experimental results that $\pi = 21.8\%$ and firm profit is 304.5 are informative regarding the extent of the deviation from the agency predictions of $\pi = 0\%$ and firm profit of 250.0.

IV. DISCUSSION AND CONCLUSION

Our experiments reveal considerable honesty. In Experiments 1 and 2 subjects give up 48.7% and 42.9%, respectively, of the available payoff by reporting honestly or partially honestly. Of course, any level of honesty must be interpreted in light of subjects' reporting incentives. The Revelation Principle establishes that firms can always get honest reporting if they pay enough for it. From this perspective, the high level of honesty in Experiments 1 and 2 is particularly surprising because the firm paid nothing for it. That is, the contract

¹⁷ We calculate expected firm profits conditional on the *actual* percentage of honesty (π) under each contract. Using expected profits eliminates any random influence of actual cost realizations. However, for completeness we note that the profit comparisons are unchanged when we use actual costs in place of expected costs. Under the TC, firm profit given actual cost draws is 232 vs. firm profit of 237 given expected cost draws. Likewise, under the HPTC, firm profit given actual cost draws is 162 vs. firm profit of 179 given expected cost draws. Finally, under the MTC, firm profit given actual cost draws is 312 vs. firm profit of 304.5 given expected cost draws.

was not designed to induce honest reporting. As a result, subjects had every reason to lie, because the more they lied the greater was their payoff, and because the absence of monitoring, auditing, and reputation effects meant that they faced none of the related negative consequences of lying.

To exploit managers' honesty most efficiently, firms must anticipate how alternative contract designs will affect reporting behavior and firm profit. Existing models cannot explain the reporting observed in our experiments. Conventional agency models assume there will be no honesty and Baiman and Lewis (1989) conclude that preferences for honesty are too weak to be important. Threshold and types models predict either 0% or 100% honesty for each subject, but we find that about half of the reports in Experiments 1 and 2 are partially honest.

The differences between our conclusions and those of Baiman and Lewis (1989) appear to reflect different experimental procedures and a different interpretation of their experimental results. With respect to experimental procedures, Baiman and Lewis (1989, 6) indicate that "through explicit instructions, examples, and computational worksheets we strongly encouraged subjects to use an expected value approach...." They justify this approach by explaining that "we guided the subjects to evaluate the *benefit* of each contract in terms of expected monetary value; but we provided no guidance for evaluating or even considering the cost of lying, which is the object of interest" (Baiman and Lewis 1989, 7). However, by instructing and training subjects to use expected monetary value maximization, the expected monetary benefit of each contract was made very salient, while the possibility that subjects might be reluctant to lie was never even mentioned. Yet, despite this strong encouragement to use an expected value approach, 41.7 percent of Baiman and Lewis' (1989, Figure 4, p. 13) subjects (20 of 48) still reported honestly, which is roughly comparable to the percentage of honesty we find for the Trust Contract ($\pi = 48.7\%$) and High Payoff Trust Contract ($\pi = 42.9\%$). Although their results provide some evidence that subjects lied more as the payoff to lying increased, 25 percent (4 of 16) of their subjects who could receive the highest payoff for lying (Baiman and Lewis 1989, Figure 4, Group 3, p. 13) still reported honestly. Thus, one can question whether their results are consistent with their assertion that "any advantage from exploiting an agent's reluctance to lie explicitly is likely, on average, to be small or nonexistent" (Baiman and Lewis 1989, 15).

Two alternative approaches that allow individuals to trade off utility for wealth and disutility for lying offer possible explanations for the high level of partially honest reports observed in this and earlier studies (e.g., Chow et al. 1988; Waller 1988). First, the trade-off approach proposed by Brickley et al. (1997) predicts that when managers' contracts increase the payoffs for unethical behavior, more unethical behavior will result. Our results provide only limited support for this prediction. The predicted negative relation between the extent of honesty and the payoff to lying is rejected in Experiments 1 and 2, and only weakly supported in Experiment 3.

Luft (1997) proposed a second trade-off approach that assumes individuals' disutility for lying increases in the size of the lie. That is, larger payoffs to lying increase both the utility from lying (via greater wealth) and the disutility from lying. Thus, individuals could maximize their utility by reporting to receive all, part, or none of the payoff available for lying, depending on the extent to which their utility for wealth and disutility for lying increase with the size of the lie. Although this approach is consistent with many of the existing empirical results, its generality limits its empirically testable implications.

finding of less honesty under the Modified Trust Contract than under the Trust Contract. That is, it appears that the reason that individuals reported less honestly under the Modified Trust Contract is that they wanted to achieve a desired distribution of the total surplus between themselves and the firm. The potential ability to explain different levels of honesty across contracts represents an advantage of our distributional hypothesis over the approaches proposed by Brickley et al. (1997) and Luft (1997).

We expect our finding of less honesty under the Modified Trust Contract to generalize to other similar agency theory contracts that include both a reporting feature (i.e., the transfer to the manager is proportional to his report) and a production feature (i.e., the level of production depends on the manager's report). Because any production hurdle increases firm profit by reducing the payoff to the manager more than it reduces the total surplus, our distributional hypothesis predicts that managers would report less honestly under any contract with a production hurdle and the reporting feature than under a corresponding contract with only the reporting feature, such as the Trust Contract.

The distributional hypothesis we propose is consistent with recent theoretical developments in economics that consider factors other than wealth maximization, such as equity and reciprocity (e.g., Bolton and Ockenfels 2000; Fehr and Schmidt 1999; Rabin 1993; Bolton 1991). These recent models reflect efforts to reconcile empirical observations that are inconsistent with conventional economic models. To the extent that equity, reciprocity or distributional effects are important, conventional reporting models misrepresent the trade-off that firms make when they reduce production to increase firm profit. The conventional analysis assumes that reducing the manager's total payoff will not affect the honesty of the manager's report, but our results suggest that managers may report less honestly as their share is reduced.

If the distributional effects suggested by our results are confirmed in future studies, then firms may be able to increase the level of honest reporting by redesigning managerial compensation. For example, paying a larger fixed salary would increase the manager's share of the total surplus and reduce the firm's share, potentially prompting more honest reporting. Of course, the firm would trade off the benefits of more honest reporting against the additional cost of a larger fixed salary for the manager. Given the potentially important consequences of the distributional hypothesis for reporting behavior and firm profit, further research is necessary to clarify the extent to which distributional concerns affect reporting.

The discussion above suggests that firms may be able to design employment contracts with different trade-offs than those suggested by conventional economic analysis. Conventional agency analyses assume all individuals are willing to lie to maximize their wealth. In contrast, our results suggest that individuals' willingness to lie is endogenous, i.e., that the extent of honesty depends on the type of contract individuals receive. Therefore, the firm should select the optimal contract, taking into account the contract's effect on the manager's willingness to lie. A potentially important role of future research is to provide further empirical evidence concerning how contract design affects the honesty of reporting and firm profit.

Finally, the discussion above also suggests that firms may be able to make other adjustments to their control systems, broadly defined, to increase the honesty of reporting and firm profit. By adopting certain cost-effective human resource policies (e.g., profit-sharing arrangements), firms may be able to improve managers' attitudes toward the firm, and thereby increase the amount of honest reporting. Moreover, such policies may produce benefits beyond increasing the level of honesty (e.g., increasing worker effort or decreasing worker turnover). Such considerations may help explain the prevalence of human resource policies designed to increase worker loyalty. Given the importance of these issues and the

central nature of reporting to accounting, our findings suggest the need for further research to clarify how factors other than conventional monetary incentives affect managers' reporting behavior.

APPENDIX

Expected Firm Profit

This appendix derives theoretical predictions for expected firm profit under the three contracts considered in the paper. Expected firm profit under each contract is expressed as a function of π , the percentage of honest reporting under that contract. Rather than analyzing total firm profit across all observations, we analyze firm profit per observation. The two analyses are equivalent because under all contracts subjects face the same distribution of expected costs.

For a given contract, expected firm profit depends on the expected cost per unit and on individual reporting behavior. The equations for expected firm profit developed below incorporate the expected cost per unit, based on the assumed uniform distribution of actual costs, and the mean percentage of honesty under that contract (π).

To measure π , we first define "payoff available" as the maximum amount that all subjects could have received across all periods if they lied to maximize their wealth. For example, under the TC and the HPTC, payoff available is based on all subjects reporting the maximum possible cost of 6.00 because that report generates the maximum possible payoff for the subjects. Next, we calculate the total amount of payoff actually claimed by

distinguishable from the same size lie produced by a report of 6.00 when the actual cost was 5.00. We believe that the first report (5.00) is actually more honest than the second report (6.00) because the first subject received only one-half of the maximum that was available, while the second subject received the maximum that was available. Defining π as the percentage of honesty enables us to distinguish these two cases.

The second, and more important, advantage of defining π as the percentage described above is that doing so enables us to express firm profit under each contract as a function of π . These firm profit functions are essential both as background for interpreting the experimental results and also in evaluating the firm's trade-offs in contract design. We next explain the relation between π and firm profit, beginning with the Trust Contract.

Trust Contract

Under the TC, the firm's expected profit (EP) can be expressed as:

$$EP(TC) = E\{-250 + 1,000\pi(6.00 - AC)\},$$

where E indicates an expectation, AC is the actual production cost per unit, $(6.00 - AC)$ is the actual profit margin per unit, and $\pi(6.00 - AC)$ is the firm's share of the profit margin per unit when the manager reports with a percentage of honesty of π . This expression demonstrates that reporting with honesty of π in this context is equivalent to "giving" the firm that percentage of the profit margin per unit. Substituting 5.00 for the expected cost per unit and simplifying the above expression yields:

$$EP(TC) = -250 + 1,000\pi.$$

Therefore, this analysis predicts that if all individuals were economic ($\pi = 0\%$), expected profit would be -250 , if all individuals were honest ($\pi = 100\%$), expected profit would be $+750$, and if individuals were, on average, 50 percent honest ($\pi = 50\%$), expected profit would be $+250$.

Hurdle Contract

Under the HC, the firm's expected profit can be expressed as:

$$EP(HC) = \text{pr}(AC \leq 5.00)(6,000 - 5,000 - 250) + \text{pr}(AC > 5.00)(-250),$$

and using the fact that the probability of a cost draw of 5.00 or less is 0.5 under the assumed uniform distribution, the above expression becomes:

$$= .5(6,000 - 5,000 - 250) + .5(-250),$$

which reduces to $+250$.

The first term is expected profit when the actual cost is 5.00 Lira per unit or less, the manager reports 5.00 or less, production takes place, revenue is 6,000, and the transfer to the manager is the 5,000 fixed transfer plus his 250 salary. The second term reflects that when the actual cost is greater than 5.00 Lira per unit, the manager reports more than 5.00, there is no production, and the manager receives his salary of 250. The HC provides all subjects with an incentive to report honestly, *independent* of whether the individual has a preference for reporting honestly. As a result, all individuals will report honestly under the

HC, making firm profit independent of π . This is reflected in the fact that the expression, $EP(HC) = +250$ is independent of π .

Modified Trust Contract

Expected firm profit under the MTC is

$$\begin{aligned} &.5\{\pi[6,000 - 4,500 - 250] + (1 - \pi)[6,000 - 5,000 - 250]\} + .5\{-250\} \\ &= .5\{\pi[500] + 750\} + .5\{-250\} \\ &= 250 + 250\pi. \end{aligned}$$

The first term, $(.5\{\pi[6,000 - 4,500 - 250] + (1 - \pi)[6,000 - 5,000 - 250]\})$, is expected profit when the actual cost is 5.00 Lira or less. When the manager reports honestly ($\pi = 100\%$) the firm receives 6,000 Lira, and the expected transfer to the manager is the expected cost of 4,500 Lira plus the manager's salary of 250. Alternatively, if the manager reported 5.00 to maximize his wealth ($\pi = 0\%$), then the firm would transfer 5,000 Lira and a salary of 250 to the manager. The second term, $(.5\{-250\})$, shows that when the actual cost is greater than 5.00, there is no production and the manager receives a salary of 250. The final expression for expected profit, $250 + 250\pi$, shows that for any value of $\pi > 0$ the expected profit under the MTC will be greater than 250, which is the expected profit under the HC.

REFERENCES

- Akerlof, G. A. 1982. Labor contracts as partial gift exchange. *Quarterly Journal of Economics* 97 (4): 543-569.
- . 1984. Gift exchange and efficiency-wage theory: Four views. *American Economic Review* 74 (2): 79-83.
- Antle, R., and G. D. Eppen. 1985. Capital rationing and organizational slack in capital budgeting. *Management Science* 31 (2):163-174.
- , and J. Fellingham. 1995. Informational rents and preferences among information systems in a model of resource allocation. *Journal of Accounting Research* 33 (Supplement): 41-58.
- Arrow, K. J. 1974. Gifts and exchanges. *Philosophy and Public Affairs* 1 (4): 343-362.
- Bajman, S., and I. H. Evans III. 1983. Pre decision information and participative management control

systems. *Journal of Accounting Research* 21 (2): 371-395.

———, and B. L. Lewis. 1989. An experiment testing the behavioral equivalence of strategically equivalent employment contracts. *Journal of Accounting Research* 27 (1): 1-20.

Becker, G. 1993. Nobel lecture: The economic way of looking at behavior. *Journal of Political Economy* 101 (2): 385-400.

- , ———, and K. Haddad. 1991. The effects of pay schemes and ratchets on budgetary slack and performance: A multiperiod experiment. *Accounting, Organizations and Society* 16 (1): 47–60.
- , M. K. Hirst, and M. D. Shields. 1994. Motivating truthful subordinate reporting: An experimental investigation in a two-subordinate context. *Contemporary Accounting Research* 10 (2): 699–720.
- , ———, and ———. 1995. The effects of pay schemes and probabilistic management audits on subordinate misrepresentation of private information: An experimental investigation in a resource allocation context. *Behavioral Research in Accounting* 7: 1–16.
- Eckel, C. C., and P. J. Grossman. 1996. Altruism in anonymous dictator games. *Games and Economic Behavior* 16: 181–191.
- Fehr, E., and K. Schmidt. 1999. A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics* 114 (3): 817–868.
- , and S. Gächter. 2000. Do incentive contracts crowd out voluntary cooperation? Working paper, Institute for Empirical Research in Economics, University of Zurich.
- Forsythe, R., J. L. Horowitz, N. E. Savin, and M. Sefton. 1994. Fairness in simple bargaining experiments. *Games and Economic Behavior* 6: 347–369.
- Hoffman, E., K. McCabe, K. Shachat, and V. Smith. 1994. Preference, property rights, and anonymity in bargaining games. *Games and Economic Behavior* 7 (3): 346–380.
- Jensen, R., and W. Meckling. 1994. The nature of man. *The Journal of Applied Corporate Finance* 7: 4–19.
- Kachelmeier, S. J. 1994. Discussion of: An experimental investigation of alternative damage-sharing liability regimes with an auditing perspective. *Journal of Accounting Research* 32 (Supplement): 131–139.
- . 1996. Discussion of: Tax advice and reporting under uncertainty: Theory and experimental evidence. *Contemporary Accounting Research* 13 (Spring): 81–89.
- Koford, K., and M. Penno. 1992. Accounting, principal-agent theory, and self-interested behavior. In *Ethics and Agency Theory*, edited by N. E. Bowie, and R. E. Freeman, 127–142. New York, NY: Oxford University Press.
- Kohlberg, L. 1969. State and sequence: The cognitive-developmental approach to socialization. In *Handbook of Socialization Theory and Research*, edited by D. A. Goslin, 347–480. Chicago, IL: Rand-McNally.
- . 1981. *The Philosophy of Moral Development: Moral Stages and the Idea of Justice*. San Francisco, CA: Harper & Row.
- Luft, J. L. 1997. Fairness, ethics and the effect of management accounting on transaction costs. *Journal of Management Accounting Research* 9: 199–216.
- Melumad, N. D., and S. Reichelstein. 1987. Centralization vs. delegation and the value of communication. *Journal of Accounting Research* 25 (Supplement): 1–18.
- Moser, D. V. 1998. Using an experimental economics approach in behavioral accounting research. *Behavioral Research in Accounting* 10 (Supplement): 94–110.
- Murphy, K. R. 1993. *Honesty in the Workplace*. Pacific Grove, CA: Brooks/Cole.
- Noreen, E. 1988. The economics of ethics: A new perspective on agency theory. *Accounting, Organizations and Society* 13 (4): 359–369.
- Penno, M. 1984. Asymmetry of pre-decision information and managerial accounting. *Journal of Accounting Research* 22 (1): 177–191.
- Rabin, M. 1993. Incorporating fairness into game theory and economics. *American Economic Review* 83 (5): 1281–1302.
- Shapiro, C., and J. E. Stiglitz. 1984. Equilibrium unemployment as a worker discipline device. *American Economic Review* 74 (3): 433–444.
- Stiglitz, J. 1974. Alternative theories of wage determination and unemployment in LDCs: The labor turnover model. *Quarterly Journal of Economics* 88 (2): 194–227.
- Waller, W. S. 1988. Slack in participative budgeting: The joint effect of a truth-inducing pay scheme and risk preferences. *Accounting, Organizations and Society* 13 (1): 87–98.

- , and R. A. Bishop. 1990. An experimental study of incentive pay schemes, communication, and intrafirm resource allocation. *The Accounting Review* 65 (4): 812–836.
- . 1994. Discussion of: Motivating truthful subordinate reporting: An experimental investigation in a two-subordinate context. *Contemporary Accounting Research* 10 (2): 721–734.
- 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.
- , and B. Lewis. 1995. Experimental incentive-contracting research in management accounting. In *Judgment and Decision-Making Research in Accounting and Auditing*, edited by R. H. Ashton, and A. H. Ashton, 55–75. Cambridge, MA: Cambridge University Press.