

The Effect of Perceived Fairness and Moral Development in an Agency Context

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Abstract

Agency theory predicts that the presence of both information asymmetry and incentives encourages managers to maximize their self-interest at the expense of the firm's owners. However, anomalies in some experimental studies (Young 1985; Waller 1988; and Chow et al. 1988) have led to speculation that ethical factors such as "integrity" or "conscience" may limit purely self-interested behavior. Kahneman et al. (1986), Noreen (1988), Rabin (1993), and Fehr and Schmidt (1999) theorize that behavior is motivated by utility preference models that incorporate factors such as integrity or fairness. Two agency studies specifically incorporating ethical factors (Rutledge and Karim 1998; Stevens 1999) find that ethical concerns attenuate managers' tendency to act strictly in accordance with self-interest.

This study examines the effect of moral development and perceived fairness on agency theory predictions of an adverse selection bias. One hundred and eighty five practicing managers responded to a cost allocation case where we manipulated information asymmetry (absent or present) and incentive (absent, low or high). Subjects also completed instruments measuring moral development (intrinsic ethical incentive) and ethical orientation (perceived equity, i.e., fairness). Results indicate that in the presence of information asymmetry and incentive to shirk, subjects exhibited the adverse selection bias predicted by agency theory. However, this tendency was significantly less prevalent for individuals with higher moral development. We also found evidence that perceived fairness of the cost allocation decision was strongly predictive of their adverse selection intention. Implications for research and for the design of management control systems are discussed.

An Exploration of the Effect of Moral Development and Perceived Fairness in an Agency Context

This study examines the mitigating effects of manager's perceptions of fairness and their moral development in an agency setting. Agency theory predicts that when managers possess both private information and potential for personal gain, they will act in their self-interest at the expense of the firm's owners (Baiman 1982, 1990; Eisenhart 1989). Negative organizational consequences of unaligned self-interested behavior can be significant, e.g., insufficient time investment in gathering and using information for strategic decision making (Kren, 1997). Thus, effective incentives and monitoring devices are fundamental components of management control systems (Kaplan and Atkinson 1998).

Self-interested action can be categorized as either moral hazard or adverse selection. Moral hazard refers to shirking, or the agent's unwillingness to exert sufficient time and effort to increase owner wealth (Kaplan and Atkinson 1998). Adverse selection refers to the agent's misrepresentation of his/her ability and accomplishments, for example at the time of hiring (Eisenhart 1989). Agency theory predicts that individuals will freely misrepresent or shirk when doing so maximizes their personal benefit (Baiman 1982). Thus, as Kaplan and Atkinson (1998 678) state, "agency theory assumes that the agent bears no moral burdens."

Traditionally, agency arguments have been framed within the rubric of contracting and transaction costs, which conclude that control systems require costly but necessary incentive contracts and monitoring arrangements explicitly designed to align management's interests with those of the firm. However, there is evidence that ethical considerations also play a role, consistent with a utility preference model which includes, e.g., fairness.

Two moral constructs have been widely explored in the accounting literature, moral development (measured using the Defining Issues Test) and ethical awareness, which includes perceived fairness (measured using the Multidimensional Ethics Scale). We study the effect of perceived fairness and moral development on agency theory predictions of adverse selection. One hundred and eighty five practicing managers made a cost allocation decision in which we manipulated information asymmetry (absent or present) and incentive (absent, low, high). Subjects also completed instruments measuring moral development and perceived fairness. Results indicate that subjects exhibited adverse selection, as predicted by agency theory. However, this effect was significantly weaker for individuals with higher moral development. We also found evidence that individuals' perceived fairness of the cost allocation decision was strongly predictive of their adverse selection intention.

Literature Review

Agency research assumes that the agent's (i.e. manager's) activities and environment are unobservable, or are costly to monitor; therefore, given any outcome, the principals (i.e. shareholders, or top management) are not fully informed about the effort the agent undertook (Kaplan and Atkinson 1998). The principal's objective is to devise an incentive system that ties rewards for any outcome to the agent's level of effort deemed appropriate by the principal (Kren 1997). At the same time, managers in local offices with private knowledge and wishing to minimize their risk of low compensation in an uncertain environment can underestimate expected targets (e.g., build slack into the budget). Consequently, to mitigate the effect of managers' self-interest and to achieve the appropriate alignment between the managers' and firms' interests, an ideal incentive plan rewards managers both for accurate targets and superior effort (Kaplan and Atkinson 1998).

Several theoretical and experimental papers in economics (Thaler 1985; Kahneman et al., 1986; Bolton 1991; Rabin 1993; and Fehr and Schmidt 1999) and accounting (Ghosh 2000; Luft 1997) suggest that the self-interest preference model is too narrow, and that broader preference models help explain evidence contradictory to a pure self-interest orientation. Specifically, these studies demonstrate that under certain conditions, for some individuals, a sense of fairness influences their behavior. Fehr and Schmidt (1999) define fairness as an aversion to inequity, and model this as the willingness to forgo a material payoff in exchange for more equitable outcomes, while Rabin (1993) summarizes fairness as treating altruistic people fairly and hurtful people hurtfully.

Experimental studies on slack-creation decisions (Young 1985; Waller 1988; Chow et al. 1988; and Chow et al. 1991) and project evaluation decisions (Harrison and Harrell 1993; and Harrell and Harrison 1994) have found that some subjects violate classical agency predictions, consistent with the models above. For example, Young (1985) found that social pressure reduced slack creation. If morality is conceived as internalized social pressure or expectations, then those who perceive an action harmful to the firm as unethical would be less likely to take that action. Luft (1997) and Ghosh (2000) argue that in examining accounting-related behavior, it is important to consider issues of ethics and perceptions of equity and fairness. Thus, the literature suggests that factors described as "ethical considerations" by Noreen (1988), "personal integrity" by Chow et al. (1988) and "aversion to lying" by Chow et al. (1991) may potentially mitigate adverse selection and moral hazard behaviors.

Two recent accounting studies that specifically incorporate ethical factors into an agency design find that ethical factors attenuate narrow self-interest behavior - in a budgetary slack creation situation (Stevens 1999) and in a project escalation decision (Rutledge and Karim 1998).

This study extends these findings in a number of ways. This paper is motivated by recent behavioral economics theory which asserts that at least some individuals have broader utility functions than agency theory's narrow model of economic self-interest (Fehr and Schmidt 1999). We also draw upon empirical ethics research framework and extend

Rutledge and Karim (1998) by employing the widely used (Louwers et al. 1997) Defining Issues Test (DIT) in a cost allocation setting to determine the interaction of moral development and agency conditions on subjects' decisions. Further, we provide a direct comparison of the explanatory power of moral development with an alternative, more direct and context-specific construct, perceived fairness, using the Multidimensional Ethics Scale (Cohen et al. 1996). Finally, we explore the effect of different levels of monetary incentives on the intention to take a questionable action.

Empirical research in accounting ethics draws heavily on the cognitive-developmental work of Kohlberg (1969, 1984) who developed a six-stage sequential model of individual moral development. Individuals at higher stages have internalized ethical standards and should behave more ethically than those at lower stages. Consequently, in management accounting settings, individuals with internalized ethical social pressures may be less likely to exhibit adverse selection or moral hazard behaviors. Rest (1979, 1986) operationalized Kohlberg's stages in the Defining Issues Test (DIT). Within accounting, researchers have used the DIT to examine the behavior of auditors, students, and management accountants (Louwers et al., 1997). Use of the DIT in an agency context will enable us to examine whether individuals with higher levels of moral development demonstrate less self-interested behavior than individuals with lower levels of moral development.

HYPOTHESES

Based on the prior discussion, we suggest that because agency theory excludes intrinsic motivation and perceptions of equity, it potentially overweights the impact of compensation on a manager's cost allocation decision. The literature on professional ethics deals with one specific intrinsic motivation - a concern for the right thing to do. Gaa (1994: 33) suggests ethics "focuses on the problems of choice when it is explicitly recognized that one's actions do have effects on others and that those effects should be taken into account in deciding how to act." In professional settings, Ponemon and Gabhart (1993, 37) define professional ethics as "a concept that implies a reasoning capability that permits the individual to render judgments unaltered by self-interest that could impair his or her professional responsibility." This reasoning capacity is developmental (Kohlberg 1969, 1984) in a staircase set of stages wherein individuals advance from lower to higher. These stages are grouped into three levels: preconventional, conventional, and postconventional. The preconventional level of moral development identifies the actor's desires and what it takes to achieve those desires. At the conventional level, development expands to take account of others' needs and to include an awareness of the need for societal order. Postconventional development encompasses the appropriateness of social actions based on guiding values or principles of rational and impartial order. Thus, higher levels of moral development are associated with greater awareness of the interests (e.g., rights) of others, and thus may directly affect . Thus, individuals at a higher level of moral development may be less willing to take an action harmful

Moreover, for individuals at higher levels of moral development, behavior is motivated by intrinsic guiding principles, and therefore may be less susceptible to the self-interested adverse selection bias predicted by agency theory.

Thus, an individual's intrinsic principles may mitigate the effect of the extrinsic compensation incentive. This leads to the following hypothesis:

- H1: Managers at a higher level of moral development are less likely than managers at a lower level of moral development to take an action costly to the firm in their own self-interest.

The intrinsic principle of rational and impartial order in postconventional ethical reasoning is a normative ethical perspective of moral equity originating with Aristotle and defined as Justice by Rawls (1971 303). "All social primary goods - liberty and opportunity, income and wealth, and the bases of self-respect -- are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favored." In other words, equals should be treated equally, and unequals unequally (Rabin 1993; Cohen et al. 1996). Thus, if an individual is influenced by a sense of fairness, they may be less likely to engage in behaviors that are purely in their self-interest if their gains are at the expense of others. Drawing on the literature that suggests that some individuals' preference for moral equity influences their actions, we propose the following hypothesis:

- H2: Managers who perceive that an action is unfair are less likely to take an action in their self-interest than managers who view the action as more fair.

METHOD

The decision task was based on interviews with senior officers in Operations and Information Technology in a company in the greater Boston area. The experimental task was to decide whether to allocate previously incurred development costs to a nearly completed project as required by company policy, or to allocate it to future projects. Allocation as required by policy would result in lower current profits that, in certain conditions, would negatively affect the manager's bonus. On the other hand, allocation to future projects would enhance current profits, resulting (in some manipulations) in an undeserved bonus, which is costly to the firm. The manipulation of information asymmetry and incentive was developed from the agency and control literature (e.g., Chow et al. 1988; Baiman 1990). In a review of the literature on discretionary accruals, Healy and Whalen (1999 376) assert that "the evidence is consistent with managers using accounting judgments to increase earnings-based bonus awards." Thus, the task incorporated bonuses that could be affected by the allocation of costs among projects. Six versions of the instrument manipulated information asymmetry (absent or present), and three levels of incentive: absent¹, small (\$5,000), and large (\$40,000). Allocating the cost to the nearly completed project would result in the decision-maker not receiving a bonus for the year. Pilot tests were conducted with MBA students to clarify any ambiguities in the task instrument. Respondents also completed the 3-story version of the Defining

¹ Specifically, this version of the instrument included no reference to the existence or otherwise of an incentive-based compensation system.

Issues Test (Rest 1979), the Multidimensional Ethics Scale (Cohen et al. 1996), manipulation checks on the manipulated variables, and demographic questions.

Subjects

Respondents were all employed as managers or management accountants, and were participating in various professional development courses in the Boston and Toronto areas. In some cases, the instrument was completed during the class session, while in others, the respondents took the instrument away for completion, and it was collected the following week. No differences in the intention to charge the cost to other projects emerged due to location or the manner in which the data were collected. Accordingly, responses were aggregated for subsequent analysis. Appendix A presents the demographic data.

Independent Variables

Information asymmetry was manipulated as high or low by changing the description of the control system in the decision environment. In the low information asymmetry version, a sophisticated information system allowed senior management to access cost information on projects on a continuous basis easily. Further, the firm had a strong internal audit department that “routinely reviewed the cost accounts of various projects.” In contrast, in the high information asymmetry version, senior management had little access to timely project cost information because the project costs were only accumulated at the end of the project. Further, there was no mention of an internal audit department. The second independent variable, incentive, was manipulated as either absent (no mention of any bonus payable), or present at a lower (\$5,000) or higher level (\$40,000). Since agency theory posits that adverse selection occurs in the presence of *both* information asymmetry and incentive to shirk (i.e., an interaction effect), the agency variable was computed as the product of the information asymmetry and incentive variables. Thus, the high agency condition was the presence of information asymmetry and a high incentive, the moderate agency condition was the presence of information asymmetry and a low incentive, and all other conditions were considered a non-agency condition. Appendix B presents the Low Information Asymmetry and \$5,000 condition. In addition to the two manipulated variables, we also examine the effect of moral development and perceived fairness. Moral development was measured using the three-story version of the Defining Issues Test (DIT) (Rest 1986). Perceived fairness was measured using the mean of the three moral equity items on the Multidimensional Ethics Scale, which have been shown in previous studies to demonstrate high reliability (Flory et al. 1992; Cohen et al. 1996). The three items were measured with seven point Likert scales anchored by “fair/unfair”, “just/unjust” and “morally right/not morally right.”

Dependent Variables

The dependent variable was the response, on a seven point Likert scale anchored by (1) “Very unlikely”, and (7) “Very likely” to the question “As Tom Davies, how likely are you to charge the \$2million to the new projects?” This measures a respondent’s intention or likelihood of taking a similar action, and is known to be a reliable antecedent and therefore predictor measure of whether they would actually take a similar action in similar circumstances (Ajzen 1988; Cohen et al. 1994).

In order to control for possible social desirability bias, which is known to be present in responses to ethics vignettes (Randall and Fernandes 1992; Cohen et al. 1996), a second question in the third person, (“How likely is it that your colleagues would charge the \$2 million to the new projects?”) was also included. Social desirability bias was measured for each respondent using the difference between the responses to the questions of whether the respondent would be likely to perform the action and the likelihood that their colleagues would perform the action (Cohen et al. 2000).

RESULTS

Two hundred and sixty-six responses were received. Of these, 40 (15%) failed the DIT internal consistency checks, and were therefore excluded from the analysis. This percentage is consistent with other studies using the DIT (Rest and Narvaez 1994). A further 41 responses had missing data and were also excluded, resulting in a valid sample of 185 responses.

Means and intercorrelations of the variables are shown in Table 1. It is interesting to note that the only significant correlation was between the MES measure of perceived fairness and the intention dependent variable.

--Insert Table 1 here--

Manipulation Checks

To test for the effectiveness of the manipulations of information asymmetry and incentive, we partitioned the sample on these two manipulated variables, and tested for differences in the responses to the two manipulations check questions. The difference in the responses to the information asymmetry and the incentive manipulation check questions were significantly different at $p=.000$; furthermore, an ANOVA test of the three-level incentive was also significant at $p=.000$. Thus, it appears that the manipulations were effective.

Effect of Moral Development and Moral Orientation

We first tested for the simple effect of agency on the intention measure using the 3-level measure of agency described above. Using regression, as expected, the agency effect was highly significant ($t=3.56$, $p=.000$).²

The means of the dependent variable under each of the manipulation conditions are shown in Table 2.

Insert Table 2 here

Because prior literature suggests that some individuals use a broader utility function than the pure self-interest of agency (Fehr and Schmidt 1999), we tested for a smaller agency

² Pooling the two incentive levels into a single “incentive present” group gave essentially the same results.

effect among respondents with higher DIT p-scores by including an interaction term (agency³ x DIT p-score) as follows

$$Intention = a + b_1(agency) + b_2(agency \times moral \ development) + error \ (1)$$

The results, shown in Table 3, strongly support hypothesis 1. However, the relatively low adjusted R² suggests that this is a very incomplete model of the cost allocation decision process.⁴

--Insert Table 3 here--

To further explore the complexity of the respondents' utility function, we used a more direct measure of respondents' orientation towards the fairness of the decision they faced, the mean of three moral equity items of the MES – just, fair and morally right (Cohen et al. 1996). These three items were combined into a single construct (Cronbach alpha =.83), and included in the following regression:

$$Intention = a + b_1(agency) + b_2(moral \ equity \ orientation) + error \ (2)$$

Examining Table 4, the coefficient of moral equity is in the predicted direction, and highly significant. The vastly increased explanatory power of this regression suggests that the moral considerations of equity and fairness play a very important part in the decision choice, since they explain a much greater variation in the dependent variable than does the agency variable.

--Insert Table 4 here--

Further Analysis

Cohen et al. (1998, 2000) found small but significant gender effects in accounting-based ethical decision making. Therefore, to control for a possible gender effect, we included the gender variable in the regression, and it was non-significant. To control for a social desirability bias (Randall and Fernandes 1992), we conducted a paired t-test and found a significant difference in the responses to the MES items “Would you do it?” and “Would others do it?” (t = 10.4, p = .000). This difference was strongly correlated with the overall perception of the morality of the action “Is it ethical?” (r = 0.49, p = .000). We therefore included this bias measure in the two regressions above. In model 1, the bias measure was highly significant, while the agency variable remained significant, but the agency-moral development interaction became marginally significant (p = .06, 1-tail). In model 2, both variables remained highly significant.⁵

We also explored the joint effect of incentive size and morality where information asymmetry and a specified level of incentive (\$5,000 or \$40,000) were present. While the non-directional ANOVA showed a main effect of incentive, as might be expected, the interactions of incentive and DIT p-score, and incentive and perceived fairness, were

³ For simplicity, agency was computed as a simple binary variable in this interaction term.

⁴ It should be noted that the significance of the interaction term is not due to a possible moral development main effect (via its correlation with the interaction), since the moral development main effect was non-significant (p=.12).

⁵ Interestingly, while the bias variable did not differ by gender, the female respondents had a marginally (p .07, 2-tailed test) significantly greater DIT p-score than the men (42.9 vs.38.2).

non-significant. However, among the respondents who perceived the action as *unfair* (below the mean score), the magnitude of the incentive had no effect, while among those who saw the action as *fair*, the high-incentive group was marginally more likely to take the action ($p=0.07$, 1-tail test) than the low-incentive group. However, when we investigated the incentive effect as a function of moral development, we found a different result. Among respondents with *high DIT scores*, those with high incentive were significantly more responsive to the larger monetary incentive ($p = .01$) than those with the low incentive, while among the *low-DIT* respondents, there was no significant incentive effect ($p= 0.25$, 2-tailed test).

DISCUSSION

Prior accounting research, using the agency theory framework, posits that in conditions of information asymmetry and appropriate incentives, managers will act in their self-interest (Kren 1997). However, there is a growing body of evidence that suggests that considerations of fairness and equity may attenuate some of the agency theory predictions (Luft 1997). This study examines the effect of moral development and perceived equity on agency theory predictions of an adverse selection bias. Experienced managers responded to a hypothetical cost allocation decision that had a potential effect on their compensation. Overall, respondents, did on average, make judgments in accordance with their self-interest. However, this tendency was less evident for individuals with higher moral development. In addition, subjects' perceived fairness of the decision was inversely related to their intention to act solely in their own self interest. This result held even after controlling for both gender and social desirability response bias.

These findings provide empirical support for the behavioral economics (Fehr and Schmidt 1999) and accounting arguments (Luft 1997) that at least some individuals are motivated by a broader utility preference model than that proposed by agency theory. In particular, individuals concerned with the effects of one's actions on others demonstrate less adverse selection. These findings are also consistent with those of Rutledge and Karim (1998) who found that both the level of moral reasoning and adverse selection affected managerial decision-making. Thus, there is growing evidence for the assertion that ethical considerations mitigate adverse selection effects.

However, our finding of a strong perceived fairness effect suggests that moral perceptions also play an important direct effect on decision-making, and is consistent with the behavioral economics literature's assertion that inequity aversion influences behavior. A future study could manipulate conditions of equity to better understand the conditions in which perceptions of inequity arise. While there is the possibility that this strong effect may in part be an artifact of our experimental design, in which respondents were sensitized to the ethical issues in the decision, the fact that it persisted after controlling for social desirability bias suggests that this result may be robust.

An interesting finding is the evidence suggesting that responsiveness to monetary incentives in the presence of information asymmetry is affected by personal morality, but intriguingly, respondents at a *higher* level of moral development were significantly

affected by the magnitude of the incentive, while those at a lower level were not. This counter-intuitive finding deserves further investigation.

As in all studies, there are limitations that represent opportunities for future research. Although the subjects were experienced managers, we did not explicitly test their knowledge of accounting. A future study might use CMA's who have more domain expertise. Secondly, despite the guaranteed anonymity, our test of social desirability response bias suggests that subjects' responses were biased to create a positive perception. Future studies in which individuals' suffer or benefit from real consequences of their decisions (for example, field or laboratory studies) could provide more insight into actual practices. Finally, several subjects did not fully complete the DIT or the case decision. It is possible that the instrument's length may have affected the quality of responses. Replications and extensions with other instruments, methodologies, and populations will provide a much clearer indication of the validity of these findings. Despite such limitations, the results of this study, especially in light of Rutledge and Karim's (1998) findings, suggest that the self-interest model presented by agency theory may be inappropriately narrow, and needs to be expanded to include other preferences.

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Table 1
Means (Standard Deviations) and Correlations

	mean	s.d.	Intention	DIT p score	Moral equity
Intention	3.98	1.51			
DIT p score	38.9	17.2	-.08		
Moral equity	5.05	1.31	-.42**	-.01	
Gender	35.5% female		-.05	.13	.12

** p<.01

Note: The response scale for intention was a seven point scale anchored by (1) “High” and (7) “Low” while the response scale for moral equity was the mean response to three questions for a seven point scale anchored by (1) High Importance Placed on Moral Equity and (7) Low Importance Placed on Moral Equity.

Table 2
Means of responses to “How likely are you to charge the \$2million to the new projects?”

	Incentive			
	None	Low	High	Total
Low Information Asymmetry	2.73 (n=30)	2.39 (n=28)	2.46 (n=35)	2.53 (n=93)
High Information Asymmetry	2.81 (n=16)	2.75 (n=44)	3.88 (n=32)	3.15 (n=92)
Column mean	2.76 (n=46)	2.61 (n=72)	3.13(n=67)	2.84 (n=185)

Note: The response scale is a seven point scale anchored by (1) “High” and (7) “Low” to the likelihood that the respondent would charge the costs to the new project.

Table 3
Regression of Agency and the Interaction of Moral Development and Agency on Intention

<i>Variable</i>	<i>Coefficient</i>	<i>t-stat</i>	<i>p (one-tail)</i>
Agency	0.98	4.12	.000
Agency-moral development interaction	.02	-2.3	.011
Adjusted R ² = .08			

Table 4
Regression of Perceived Fairness and Agency on Intention

<i>Variable</i>	<i>Coefficient</i>	<i>t-stat</i>	<i>p (one-tail)</i>
Agency	.436	3.50	.001
Perceived Fairness	-.83	11.3	.000

Adjusted R² = .48

Appendix A
Demographic Data

Gender	65% male
Age	under 25 . 36 (20%) 26-30 85 (48%) 31-40 .. 42 (24%) 41-50 . 13 (7%) over 50 ... 3 (1%)
Nationality	Canadian 105 US 79

Appendix B
HIGH INFORMATION ASYMMETRY, LOW (\$5,000) BONUS
VERSION OF INSTRUMENT

Tom Davies, a project manager in Pure Marine's Membrane and Related Equipment Group, sat in his office considering how to account for the last \$2 million of a \$5 million Technical Improvement R&D expenditure which had just arrived in his internal mail for cost allocation. He had originally approved the expenditure over a year ago for Project K (3), but he was now unsure whether to charge this last \$2 million to the nearly completed K (3), or to two recently started projects.

Pure Marine

Since its founding in 1948, Pure Marine had maintained industry leadership in providing clean water. For almost fifty years, the company had developed membrane-based and other advanced technology systems for municipal and industrial markets. This technology is used for desalination and wastewater treatment as well as the production of highly pure water. These markets currently account for 52% of Pure Marine's revenues and 37% of earnings. The other two major business areas included operation or owner/operation of water treatment facilities for customers (26% of revenues and 43% of profits) and a consumer products group providing household bottled water, purification systems and bleach and cleaning products (22% of revenues and 20% of earnings).

Overall, the company had been growing steadily. Current annual targets were 20% growth in revenues and profits. During the past nine years, total company revenues had grown at an average annual rate of 16% while earnings per share grew at an average annual rate of 30%. This pace kept Pure Marine near the top of a strong and steadily growing industry. While a substantial portion of Pure Marine's recent growth has come from the supply of its own equipment in an own-and-operate or service mode, the membrane and related equipment business was also an important contributor to the business mix. For example, a recent boom in construction of semiconductor chip plants caused a resurgence in the company's capital equipment business by dramatically increasing its activities in the manufacture of very large ultra pure water systems for companies like Digital and Motorola.

A typical order for Pure Marine's Membrane and Related Equipment was in excess of \$5 million, and in a typical year, Pure Marine received some dozen orders. Projects took approximately 18 months from the order to handover to client. Pricing was based on extensive cost estimation processes prepared under the direction of project managers who were responsible for delivering the completed project to the customer. The project managers reported to the Membrane and Related Equipment Group Vice President. Each project was unique, depending on specific water conditions as well as local environmental, sociopolitical and economic issues.

In the past, the unique nature of each project had occasionally led to cost overruns, sometimes causing significant project losses. Under the old cost accounting system, cost

overruns were only discovered at the end of the construction, after all project costs had been accumulated. Senior management looked very unfavorably on these surprise and sometimes substantial losses. However, during the past year, the systems department had significantly enhanced the in-progress reporting for project costs. Formerly, only aggregate cost information was available to project managers after completion of projects. Under the new system, all projects were on a network, and detailed current information on the amounts originally budgeted, the amount spent to date, the dollar value of purchase orders placed, and the remaining balance available, broken down by sub-accounts, were accessible on-line not only to project managers, but also to the Group VP and senior management. This new easy access to information had delighted senior management, who could check the status of project costs at any time. This more detailed tracking system also recorded who accessed the project cost data, and the project managers found that the Group VP was carefully reviewing each project's costs several times a week. Additionally, Pure Marine has a strong, independent internal audit department, which routinely reviewed the cost accounts of various projects. In short, top management had detailed information and were well informed about the operation of the Membrane group.

The Membrane and Related Equipment Group was under pressure to contribute to the management's aggressive growth targets by delivering not only completed projects but profitable ones. Tom had been a project manager with Pure Marine for three years, and reported to the Group vice-president. Like the other project managers, he had once or twice underestimated the cost of projects over that period. Fortunately for him, none had led to a loss. But today, near the end of the fiscal third quarter, he was sitting very uneasily in his office. He was responsible for three projects in various stages of completion. One, Project K (3), due "in" within the next quarter, was a \$7 million water treatment facility for a mid-size city. The geological analysis had not revealed certain environmental problems that surfaced halfway through the construction. Further, the final cost of special insurance for handling the relocation of specially constructed gas lines had not been anticipated. Together, the overruns threatened to make the project cost \$8.2 million, nearly 20% over budget and resulting in a sizeable loss. These headaches couldn't have come at a worse time. Senior management was looking to strong fourth quarter results to reach profit targets.

Tom's compensation included a salary of \$97,500 and a bonus based on the profitability of projects under his responsibility. Tom estimated that if Project K (3) came in profitable, he would earn a bonus of \$5,000, but an unprofitable Project K (3), while not jeopardizing his future prospects, would mean no bonus for the year.

The Project Cost Allocation Problem Tom knew there were ways to move costs among projects. He had two other projects under his responsibility that were just starting, and he was considering whether he should charge the last \$2 million of technology development costs noted at the start of this case to these new projects. The first \$3 million had already been charged to Project K (3). The technology developments had originally been authorized by Tom and the head of R&D (who had recently left the company for a lucrative position in Asia) as a requirement for Project K (3), and, according to company

policy, all should be assigned to that project. However, the cost savings arising from the development would likely benefit the two new projects, too. It was always a little tricky to determine just which projects benefited from the technological improvements generated by these engineering initiatives. If he shared the full amount of the last \$2 million in costs among the other two projects, the total cost of Project K (3) would be correspondingly lower, increasing the current year's profitability.

It was very likely that, with the new cost system and the active internal audit department, top management would discover this allocation. However, if they did question the allocations, Tom felt that he might be able to explain the allocation as a clerical oversight. He sat in his office considering whether or not to charge these costs to the new projects.

For the following questions, please indicate by circling the number on the scale, which most closely represents your decision or belief. The closer you place a circle to the end points, the stronger you agree with the phrase at that end of the scale.

If Tom allocates the \$2 million to the new projects, what difference will it make to his compensation?	No difference 1 2 3 4 5	A large difference 6 7
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If the costs are allocated to the new project, how likely is it that the allocation will be discovered by top management?	Very Unlikely 1 2 3 4 5	Very Likely 6 7
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The probability that I would undertake the same action is	High 1 2 3 4 5	Low 6 7
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The probability that my peers would undertake the same action is	High 1 2 3 4 5	Low 6 7
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Suppose that Tom Davies charged the final \$2 million cost to the other two new projects. Please indicate your views about this action on the following scales.

Charging \$2 million to the new projects is:	Just 1 2 3 4 5	Unjust 6 7
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Unfair 1 2 3 4 5	Fair 6 7
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Morally Right 1 2 3 4 5	Not Morally Right 6 7
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