ABSTRACT: In this paper, we investigate the role of financial incentives and social incentives in multi-task settings where the agent makes an effort-level choice and an effort-allocation choice. We focus on a setting where these choices are not independent and an active trade-off between effort level and effort allocation exists. Social incentives play a crucial role in this trade-off. While financial incentives increase the effort level, social incentives congruent with the principal's interest mitigate the distortions in effort allocation associated with financial incentives, which improves the effectiveness of financial incentives. In a $2 \times 2$ experiment, we find that participants who receive distorting financial incentives provide significantly more total effort than participants who receive a fixed wage, but they allocate effort significantly less congruently. However, the effort-allocation distortion caused by distorting financial incentives is significantly reduced by congruent social incentives. We further find that the level of effort on the unmeasured task is not significantly different between fixed wages and financial incentives, which implies that distortions in effort allocation are driven by doing more of the measured task instead of doing less of the unmeasured task. Our findings have important implications for both theory building and organizational practices.

Keywords: multi-tasking; distorting financial incentives; social incentives; effort level vs. effort allocation; ethical concerns.

Data Availability: Data are available from the authors upon request.

INTRODUCTION

In this paper, we investigate the role of financial incentives and social incentives in multi-task settings. While incentive contracting in single-task settings is concerned with inducing the agent to provide effort, an additional concern in multi-task settings is the allocation of this effort over multiple tasks (Holmström and Milgrom 1991). When the agent's multiple tasks are measured with varying levels of noise, financial incentives can cause a problem of managers shifting their attention to those tasks where effort is measured more precisely. Holmström and Milgrom (1991) conclude that, in a setting where performance on one task is not measurable or can only be measured with high levels of noise, a fixed wage may be optimal to assure a congruent effort allocation, even though overall

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1 Unless explicitly stated otherwise, we refer to effort allocation as the effort on one task relative to the overall level of effort.
effort will be lower. This conclusion is consistent with the prevalence of fixed wages in practice, but it is inconsistent with the casual observation that incentives are often used in multi-task settings where performance on individual tasks is measured with varying measurement quality or where some tasks are not contractible. Although the theoretical literature provides a number of economic explanations for the casual observation (see e.g., Prendergast 2002), we hypothesize and find that non-economic incentives play a crucial role in the use of financial incentives in multi-task settings.

The main argument that we present in this paper is the following. In multi-task settings, the effort choice of the agent is multidimensional and consists of an effort level choice and an effort allocation choice. Different compensation contracts have different impacts on these different dimensions. Financial incentives have the benefit of increasing the effort level, but at the cost of directing the attention away from noisy performance measures, i.e., they create a distorted effort allocation. Fixed wages have the benefit of an effort allocation that is more congruent with the principal’s preferences, but at the cost of a low effort level. In the case of performance on one task being measured with infinitely large noise, it becomes optimal for the principal to use fixed wages and settle for a low effort level with a congruent allocation instead of a high effort level with no allocation to the “noisy task” under financial incentives (cf., Holmström and Milgrom 1991). However, in the absence of a “corner solution” of zero effort allocation to the noisy task, there is a trade-off between effort level and effort allocation. That is, the principal may prefer a high effort level with a somewhat distorted effort allocation over a low effort level with a congruent allocation and thus prefer financial incentives over fixed wages. The focus of our paper is on the mechanisms that affect this trade-off and how these mechanisms are enforced.

The mechanisms that we examine are social incentives and ethical concerns. Previous research indicates that non-economic factors are relevant in decision making and control (Ashton 1990; Awasthi and Pratt 1990; Libby and Lipe 1992; Bonner and Sprinkle 2002; Sprinkle 2003). Social incentives seem to play an important role in modern work environments and they exist in many organizations where people work together in groups and teams (Fehr and Gächter 1999; King 2002; Towry 2003). Identification with a group of people, for example, by means of a strong corporate identity and frequent social interaction among employees, creates an environment with social incentives. Social norms can provide an incentive for individuals to follow a certain course of action, which might be different from that based on financial incentives.

Similarly, decision making is also affected by individual characteristics of the decision maker such as ethical concerns. Individuals who have high ethical concerns are less likely to act purely opportunistically because they derive a disutility from deviating from the ethical norm. In multi-task settings, this implies that social incentives and ethical concerns can have a decision-influencing role and affect the effectiveness of financial incentives. More specifically, in the presence of a social norm and ethical norm with respect to congruent effort allocation, financial incentives assume the role of increasing the effort level, while social incentives and ethical concerns assume the role of promoting a congruent effort allocation. Thus, social incentives and ethical concerns can mitigate the distortions in effort allocation associated with the use of financial incentives and therefore improve the cost-benefit trade-off of using financial incentives in multi-task settings.

We develop hypotheses about the agent’s response to different types of incentives, which we substantiate with a simple model, and test these hypotheses by use of an experiment. In most principal-agent relationships there is a diffuse social and ethical norm to exert some effort level that is more than the minimum level of effort but not the maximum. Aside from a norm to exert some level of effort, there are incentive mechanisms that
influence the effort allocation across several tasks. Given that a major concern in multitasking is effort distortion, we focus in this study on incentive mechanisms that affect the effort allocation. Furthermore, in actual practice, the allocation of effort is often the point of attention rather than the level of effort. An example closest to home is the allocation of effort among research and teaching. We run a $2 \times 2$ experiment to examine how congruent social incentives affect the impact of fixed wages and distorting financial incentives on effort level and effort allocation when individuals need to perform multiple tasks. In the experiment, participants have to choose an overall effort level, and subsequently allocate their effort between two tasks. The firm’s preferred effort allocation is 50/50. We randomly assign participants to one of the following four treatments: (1) fixed wage/no social incentives, (2) financial incentives on one task/no social incentives, (3) fixed wage/congruent social incentives, and (4) financial incentives on one task/congruent social incentives.

Our findings can be summarized as follows. We find that participants who receive distorting financial incentives provide significantly more effort than participants who receive a fixed wage, but they allocate significantly less effort to the unmeasured task. However, this effort allocation distortion is significantly lower when participants face congruent social incentives. That is, when participants receive distorting financial incentives, their effort allocation to the unmeasured task is significantly larger in the presence of congruent social incentives compared to the absence of such incentives. We further find that the level of effort on the unmeasured task is not significantly different between fixed wages and financial incentives. This implies that, contrary to common criticism, distortions in effort allocation caused by financial incentives are not driven by doing less of the unmeasured task but rather by doing more of the measured task. Finally, we find that ethical concerns (individual norms) and social incentives (group norms) reinforce each other. Social incentives act as an enforcement mechanism for participants to behave in accordance with their ethical norms, while ethical concerns act as a mechanism to enforce the social norm.

This paper contributes to the literature in a number of ways. First, it is one of the first experimental studies on multi-task settings. Whereas a recent experiment by Fehr and Schmidt (2004) investigates the choice of compensation schemes by a principal and how this choice affects effort allocation of agents, our study considers social incentives and ethical concerns as important variables that influence the behavior of agents in multi-task settings. Second, it extends the literature on social incentives by indicating the relevance of these types of incentives in multi-task settings. While financial incentives promote higher levels of effort, congruent social incentives promote a less distorted effort allocation. We indicate that the existence of social incentives might create settings wherein financial incentives are preferred over fixed wages even though part of the agent’s job cannot be measured. Third, we explicitly model social incentives and thereby provide a specific conceptualization of this variable, which allows us to determine the logical consequences of this conceptualization. We show that, even though socially cooperative behavior mitigates agency problems of effort allocation, this comes at a cost to the principal in terms of a

---

2 Effort level is also a concern in multi-task settings. However, as in most agency models not necessarily in the sense that the agent is lazy, but rather in the sense that the agent spends effort on tasks that do not benefit the principal. In most models, such activities are labeled “leisure.”

3 In this paper, we define congruent social incentives as a motivational mechanism based on a social norm to allocate effort according to the principal’s preferences.

4 Although we label two out of four treatments “no social incentives,” they reflect in actuality “weak” social incentives because all participants are informed that a 50/50 allocation maximizes firm value. This information on the principal’s preference induces a fiduciary duty among participants to act at least partially in line with the objectives of the principal.
reduction in the effort level. Finally, our paper finds that social incentives and ethical concerns act as each other’s enforcement mechanism, which indicates that the individual cannot be separated from its social context.

The remainder of this paper is organized as follows. In the next section, we discuss the theory and develop the hypotheses. In the third section, we describe the experimental method, and we present the results in the fourth section. We discuss the implications of our results and provide a summary in the final section.

THEORY AND HYPOTHESES

Financial Incentives

Agency theory is concerned with the design of optimal incentive contracts by a risk-neutral principal to solve moral hazard problems with respect to a risk-averse and effort-averse agent. The effort aversion of the agent reflects the conflict of interest between him and the principal. Critics argue that the classical single-task view of the agency problem is too simplistic and too far away from reality (Indjejikian 1999). Single-task models are only a limited representation of the world, because the action that improves the principal’s expected payoff in these models has only one dimension. Multi-task models, however, represent more complex action choices on the side of the agent. Concerns with respect to single-task models have become popular over the last decade and have resulted in an emphasis on multi-task agency models (e.g., Holmström and Milgrom 1991; Feltham and Xie 1994; Hemmer 1996; Datar et al. 2001). Whereas incentives in single-task agency models are used to motivate effort to improve the principals expected payoff, incentives in multi-task settings serve additionally to allocate effort between the different tasks.

In their seminal paper, Holmström and Milgrom (1991) indicate that inducing a certain effort allocation can become problematic when effort is measurable on one task, but not on the other task. In an agency setting with two substitute tasks of equal importance to the principal and performance measured on one task but not on the other task, agents will shift their effort to the measured task when provided with financial incentives. Given that this effort allocation is inconsistent with the principal’s objective, Holmström and Milgrom (1991) conclude that a fixed-wage contract may be optimal in such a multi-task setting to avoid the distorting effects of financial incentives. This conclusion holds under the assumptions that (1) under a fixed wage contract, the agent is willing to provide some effort and allocate this effort according to the objectives of the firm instead of following a random strategy, and (2) financial incentives are the only force that affect the agent’s initial effort choice. In this paper, we focus on the latter assumption.

The question of interest is whether there are circumstances where financial incentives solely based on one task will not lead to a zero-effort allocation to the other task. If there is some mechanism that assures a nonzero-effort allocation to the unmeasured task, then the question is whether financial incentives can lead to a situation where the principal prefers a high effort level with a somewhat distorted effort allocation over a low effort level with a congruent allocation. Social incentives can be one such mechanism.

Social Incentives

Besides financial incentives, other more socially mediated motivations play an important role in individual decision-making. Individuals derive a utility from reputation, where reputation effects are a consequence of obeying social customs (Romer 1984; Naylor
Efforts toward social approval are aimed to lower psychological costs, as nonconformity to group norms can be psychologically costly for individuals due to the social sanctions imposed, where social sanctions often take the form of ridicule, name-calling, or social ostracism (Roethlisberger and Dickson 1939; King 2002). Fischer and Huddart (2004) incorporate the aspect of social norms into an agency model and show that this socially mediated mechanism can even change the optimal design of firms.

Experimental studies confirm the importance of social incentives in individual decision-making. In a public good experiment where the individual payoff depends on the action of all members in a group, Fehr and Gächter (2000) find that free-riding decreases in the presence of social incentives, through either social approval or punishments. Towry (2003) examines the effects of social ties on mutual monitoring contracts and finds that horizontal monitoring systems are effective in case of strong social ties in a group, as individual actions are influenced by group affiliation and group norms. Although Towry’s (2003) study does not involve a public good, individuals in her experiment do influence the payoff of fellow team members. Finally, King (2002) finds, in an audit setting, that the self-serving bias of auditors is neutralized when they are exposed to social pressure to conform to group norms.

The type of social incentives that we focus on in this paper is most in line with King (2002). Social incentives in our study involve the potential psychological costs to an individual of not behaving in line with a social norm. These costs are incurred when the agent actually needs to justify his deviation from the social norm in front of his fellow group members. In contrast to public good experiments, the payoffs to the group members in our study are not affected by the agent’s decision. Only the principal, who is not part of the group, is affected by the agent’s actions, but she is unable to observe these actions. As a result, the content of our social incentives construct relates to the embarrassment of admitting that one has deviated from a social norm.

We focus on these types of incentives because they are commonplace and they can explain why some observed explicit contracts that appear dysfunctional might in fact not be. If individuals are subject to social pressure and there exists a socially desirable effort allocation, i.e., a social norm, then this can affect the agent’s effort choice. To illustrate this and to facilitate further analysis, we use a simple formalization of the agent’s problem (see the Appendix for the principal’s problem). Assume a two-task setting where the principal contracts with a risk-averse agent who has negative exponential utility and the following notations apply:

1) Total effort \( E \);
2) Effort allocation to Task B = \( \alpha \), with \( \alpha \in [0,1] \);
3) Effort on Task A = \( A = (1 - \alpha)E \);
4) Effort on Task B = \( B = \alpha E \).

Assume that the agent is willing to provide some effort in the absence of financial incentives (cf., Holmström and Milgrom 1991) and for simplicity assume that the agent’s cost of effort function is as follows:

\[
C(E) = c + \frac{1}{2}E^2 - kE \quad \text{with } c,k > 0
\]  

The purpose of our paper is to examine how social incentives affect the effectiveness of financial incentives. For this reason, we characterize reputation as being solely related to social incentives and ignore the possibility that reputation concerns are driven by financial motives such as higher future pay, because these latter incentives are a form of financial incentives.
where \( c \) is a given fixed cost and \( k \) is the level of effort that the agent is willing to provide in the absence of financial incentives. Further, assume that the agent is initially paid a fixed wage \((\bar{w})\) and is also subject to social incentives, where the social incentives are reflected by a “cost of noncompliance.” In modeling this cost of noncompliance, two issues are noteworthy. First, any effort allocation that deviates from the social norm is “noncompliance” and thus costly, irrespective of whether “more” or “less” is allocated. Second, to assure that the agent’s expected utility is strictly concave in the effort choice, which justifies the use of the first-order condition approach, we require the cost associated with the effort allocation to be convex. The convexity of the cost function allows for an interior solution and, thus, an analysis of the active trade-off between effort allocation and effort level.\(^6\) Note that this requirement is identical to requiring the cost of effort level, i.e., Equation (1), to be convex (see e.g., Lambert 2001, 34). Based on these two issues, we use the following cost of noncompliance function:

\[
\lambda (\alpha - \alpha^m)^2 \quad (2)
\]

where \( \lambda \) is nonnegative and reflects the extent to which the agent is exposed to social incentives, and \( \alpha^m \) is the social norm.\(^7\) For tractability reasons, we use this specific quadratic form to model convexity. Based on the above assumptions, the agent’s goal is to maximize the following objective function \((OF):\(^8\)

\[
OF = w - c - \frac{1}{2}E^2 + kE - \frac{1}{2}(\alpha^m - \alpha)^2. \quad (3)
\]

Then the optimal responses by the agent are:

\[
E^o = k; \quad (4)
\]

\[
\alpha^o = \alpha^m. \quad (5)
\]

The intuition underlying these responses is as follows. Given that neither the effort-level choice nor the effort-allocation choice leads to any benefits to the agent, the agent’s problem becomes one of cost minimization where the effort-level choice and the effort-allocation choice are independent decisions. The agent chooses an effort level that minimizes his cost of effort, where effort is represented in units of disutility. Given that the disutility is assumed to be equal for both tasks, the agent chooses an effort allocation that minimizes his cost of noncompliance. As a result, the agent provides a level of effort that he is willing to provide “for free” and allocates this effort according to the social norm.

Assume now that the agent is compensated based on performance, but that only a performance measure for Task A is available for contracting purposes, i.e., there is no

---

\(^6\) For completeness we note that, if we assume a linear cost of noncompliance function (e.g., \(\lambda |\alpha^m - \alpha|\)), the inferences are similar to those presented in this paper. The major difference is that, under a linear cost function, the agent’s effort allocation results in a corner solution of either completely ignoring the unmeasured task or completely conforming to the social norm, depending on how strong the social incentives are.

\(^7\) As mentioned in the introduction, we focus on social incentives that affect the effort allocation. This focus does not by definition preclude an analysis of social incentives that affect the effort level, but this focus is in our view necessary to examine the specific issue of interest of this paper.

\(^8\) Note that the objective function does not include a risk premium, since the agent is paid a fixed wage and risk-sharing issues are therefore absent.
The Role of Financial Incentives and Social Incentives in Multi-Task Settings

jointly observable and verifiable performance measure for Task B nor an overall measure of both tasks.\(^9\) The performance measure available for contracting is represented by:\(^{10}\)

\[ y = A + \varepsilon = (1 - \alpha)E + \varepsilon \quad \text{with} \quad \varepsilon \sim N(0, \sigma^2) \]  

(6)

where the variance of \( \varepsilon \) is assumed to be independent of the agent’s effort choice. The linear incentive contract is given by:

\[ s(y) = w + \beta y \]  

(7)

where \( w \) is a fixed wage and \( \beta \) is the incentive weight. For an agent who is provided financial incentives in addition to being subject to social incentives, the objective function and optimal responses can be presented by:\(^{11}\)

\[ OF = w + \beta(1 - \alpha)E - c - \frac{1}{2}E^2 + kE - \frac{1}{2}(\alpha^m - \alpha)^2 - \frac{1}{2}\beta^2\sigma^2 \]  

(8)

\[ E^o = \beta(1 - \alpha) + k \]  

(9)

\[ \alpha^o = \alpha^m - \frac{\beta E}{\lambda} \]  

(10)

where \( r \) is a measure of the agent’s constant absolute risk aversion. These responses show that the effort allocation of the agent to the unmeasured Task B will be less than the social norm and total effort will be larger than \( k \). Further, increases in the effort allocated to Task B decrease effort level and vice versa, hence the trade-off between effort level and effort allocation.

The intuition underlying the above results is as follows. Financial incentives on Task A provide the agent with marginal benefits of effort, which lead him to increase his effort level as compared to fixed wages (Equation (4) versus Equation (9)).\(^{12}\) Further, the agent has the ability to increase these marginal benefits by simply decreasing the effort allocated to Task B. The agent is, however, limited in reducing the effort allocation because of the social incentives in place and the associated cost of noncompliance. If social incentives are sufficiently strong, then the agent will allocate some effort to Task B, though less than the social norm (Equation (5) versus (10)). Finally, the effort level \( (E) \) and the effort allocated to Task B \( (\alpha) \) are negatively related because, \textit{ceteris paribus}, an increase in the effort allocation

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\(^9\) This does not imply that we cannot measure performance on Task B or that an overall measure does not exist. It only implies that we cannot contract on these measures. For example, Task B could be related to “cooperative behavior.” Even though a supervisor might be able to subjectively assess performance on this dimension, this assessment cannot be contracted upon explicitly because it is not observable to others and/or not verifiable. Further, an example of an overall measure is the gross payoff to the principal, which might not be contractible because the consequences of the agent’s actions are only fully realized after contract termination. This latter assumption is standard in (most of) the multi-task literature (see the Appendix).

\(^{10}\) Note that whether we assume that the contractible performance measure is noisy \( (\sigma^2 > 0) \) or perfect/noiseless \( (\sigma^2 = 0) \) is not relevant in our setting, in the sense that it has no effect on any of our hypotheses. In the experiment, we use a noiseless contractible performance measure. For more details on this issue, see the Appendix.

\(^{11}\) Equation (8) equals the certainty equivalent that the agent maximizes once we assume (1) linear incentive contracts, (2) exponential utility, and (3) normally distributed random variables (Holmström and Milgrom 1991). The last term \( (\frac{1}{2} \beta^2 \sigma^2) \) equals the risk premium that the agent demands for being compensated on a noisy performance measure.

\(^{12}\) Following Equation (8), the marginal benefits of effort to the agent equal \( \beta(1 - \alpha) \).
allocated to Task B reduces the marginal benefits of effort and thus the effort level, while an increase in the effort level creates a demand for higher marginal benefits and thus a decrease in the effort allocated to Task B.

Based on the above discussion, we can distinguish four different scenarios (or treatments): (1) fixed wage and no social incentives, (2) financial incentives and no social incentives, (3) fixed wage and social incentives, and (4) financial incentives and social incentives. For each of these treatments, the optimal effort level and effort allocation are as follows:

(1) Fixed wage and no social incentives:\(^{13}\)
- \(OF = \omega - c - \frac{1}{2}E^2 + kE\);
- \(E^o = k\);  
- \(\alpha^o \in [0,1] \rightarrow \alpha^o = \frac{1}{2}\).

(2) Financial incentives and no social incentives (denoted by subscript \(\beta\)):\(^{14}\)
- \(OF = \omega + \beta(1 - \alpha)E - c - \frac{1}{2}E^2 + kE - \frac{1}{2}\beta^2\sigma^2\);
- \(E^o_\beta = \beta(1 - \alpha) + k\);  
- \(\alpha^o_\beta = 0\).

(3) Fixed wage and social incentives (denoted by subscript \(\lambda\)):
- \(OF = \omega - c - \frac{1}{2}E^2 + kE - \frac{1}{2}(\sigma^m - \alpha)^2\);
- \(E^o_\lambda = k\);  
- \(\alpha^o_\lambda = \alpha^m\).

(4) Financial incentives and social incentives (denoted by subscript \(\beta\lambda\)):
- \(OF = \omega + \beta(1 - \alpha)E - c - \frac{1}{2}E^2 + kE - \frac{1}{2}(\sigma^m - \alpha)^2 - \frac{1}{2}\beta^2\sigma^2\);
- \(E^o_{\beta\lambda} = \beta(1 - \alpha) + k\);  
- \(\alpha^o_{\beta\lambda} = \alpha^m - \frac{\beta E}{\lambda}\).

In what follows, we assume that the social norm is doing what is first-best, i.e., \(\alpha^m = 0.5\). We make this assumption because we are interested in factors that might improve the usefulness of financial incentives, holding the usefulness of fixed wages constant. If social incentives are present (\(\lambda > 0\)) and the social norm is not equal to the principal’s preference (50/50 allocation), then fixed wages are always less useful than when social incentives are absent (\(\lambda = 0\)). Even though this is an interesting setting, we omit this scenario from our analysis. Under the assumption that \(\alpha^m = 0.5\), the optimal responses have the following empirical implications:

(1) \(E^o_{\beta} > E^o_{\beta\lambda} > E^o_k = E^o = k\);
(2) \(\alpha^o_{\beta} < \alpha^o_{\beta\lambda} < \alpha^o_k > \alpha^o = \frac{1}{2}\);
(3) \(\text{Cov}(E^o_{\beta\lambda}, \alpha^o_{\beta\lambda}) < 0\).

The first two empirical implications lead to Hypotheses 1 and 2:

---

\(^{13}\) In this case, the agent’s objective function does not include a cost of noncompliance and the agent therefore incurs no cost when deviating from the social norm. Further, given that the agent receives a fixed wage, he is actually indifferent regarding the effort allocation. Although the agent is indifferent, the principal is not indifferent and the standard economic argument of Pareto optimality is therefore that the agent will follow the principal’s preference, i.e., a 50/50 allocation. The optimal effort level follows from the same argumentation as discussed for Equation (4).

\(^{14}\) In this case, the agent can increase his marginal benefits of effort by decreasing the allocation of effort to Task B. Given that the agent’s objective function does not include a cost of noncompliance, the agent incurs no cost when reducing the effort allocation to Task B and he will therefore maximize this reduction, i.e., \(\alpha = 0\). The optimal effort level follows from the same argumentation as discussed for Equation (9).
**H1:** The effort level is highest when individuals receive distorting financial incentives and lack congruent social incentives, lower when they receive distorting financial incentives and face congruent social incentives, and lowest when they receive a fixed wage, regardless of whether they face congruent social incentives.

**H2:** The relative effort allocated to the unmeasured task is lowest when individuals receive distorting financial incentives and lack congruent social incentives, higher when they receive distorting financial incentives and face congruent social incentives, and highest when they receive a fixed wage, regardless of whether they face congruent social incentives.

These hypotheses show that the ordering of the treatments in terms of effort level is identical to the ordering of effort allocation to Task B, but with opposite signs. Thus, across the treatments, there is a trade-off between effort level and effort allocation.

The third empirical implication indicates that a similar trade-off exists within the treatment with distorting financial incentives and congruent social incentives, given the negative covariance between effort allocation and effort level. This leads to Hypothesis 3:

**H3:** Within the treatment with distorting financial incentives and congruent social incentives, there is a negative cross-sectional correlation between the effort level and the relative effort allocated to the unmeasured task.

The above expectations are summarized in Panel A of Table 1.

---

### TABLE 1
**Overview of Experimental Method and Expectations**

**Panel A: Expected Effort Level and Effort Allocation per Experimental Treatment**

<table>
<thead>
<tr>
<th>No Social Incentives</th>
<th>Social Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Wage</td>
<td></td>
</tr>
<tr>
<td>$\alpha = \alpha^\text{First-Best} = \frac{1}{2}$</td>
<td>$\alpha_k = \alpha^\text{social norm} = \frac{1}{2}$</td>
</tr>
<tr>
<td>$E = k$</td>
<td>$E_k = k$</td>
</tr>
<tr>
<td>$\rho(E, \alpha) = 0$</td>
<td>$\rho(E_k, \alpha_k) = 0$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distorting Financial Incentives</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_{\beta} = 0$</td>
<td>$0 &lt; \alpha_{\beta\alpha} &lt; \frac{1}{2}$</td>
</tr>
<tr>
<td>$E_{\beta} = \beta(1 - \alpha_{\beta}) + k$</td>
<td>$E_{\beta\alpha} = \beta(1 - \alpha_{\beta\alpha}) + k$</td>
</tr>
<tr>
<td>$\rho(E_{\beta}, \alpha_{\beta}) = 0$</td>
<td>$\rho(E_{\beta\alpha}, \alpha_{\beta\alpha}) &lt; 0$</td>
</tr>
</tbody>
</table>

**Panel B: Effort Levels and Cost of Effort**

<table>
<thead>
<tr>
<th>Overall effort level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of effort (€)</td>
<td>0.56</td>
<td>1.11</td>
<td>1.67</td>
<td>2.22</td>
<td>3.33</td>
<td>4.44</td>
<td>5.56</td>
<td>6.67</td>
<td>8.56</td>
</tr>
</tbody>
</table>

---

*a* The effort allocation “α” represents the amount of effort allocated to the unmeasured task (Task B) relative to overall effort. The effort level is represented by $E$ and the effort level that is provided by the agent without any incentives is denoted as $k$.

*b* Social incentives relate to the exposure to a social norm of allocating effort evenly among the two tasks indicated by subscript $\lambda$.

*c* Distorting financial incentives relate to a piece-rate on Task A and no incentives on Task B indicated by subscript $\beta$.

*d* Effort levels represent the amount of effort on Task A plus Task B.
Ethical Concerns

In addition to financial and social incentives, individual decision making is also affected by individual characteristics of the decision maker. When exposed to the same situation, different people react differently because of personality differences. For example, recent studies suggest that human subjects have a preference for honesty (Evans et al. 2001), respond reciprocally to acts of kindness (Hannan 2005), and are influenced by ethical concerns (Stevens 2002). Ethical concerns differ from person to person and indicate the importance of a certain norm and code of conduct to an individual. Individuals who have low ethical concerns are motivated by self-interest, i.e., personal gain at the expense of others, while individuals with high ethical concerns are less likely to act purely opportunistically because they derive a disutility from acting in an unethical way (Luft 1997; Stevens 2002; Schatzberg and Stevens 2004; Stevens and Thevaranjan 2003). An important question here is what drives this disutility from acting unethically or, in other words, how is an ethical norm enforced (Noreen 1988)?

One driver of disutility is conscience, which creates internal discomfort when acting unethically. Individuals with ethical concerns driven by conscience are motivated to behave ethically because they feel the obligation to do so and not following this obligation creates a disutility. The ethical concerns are fully internally mediated and individuals simply feel responsibility for the effects of their actions on others (e.g., Arrow 1974; Stevens 2002). In our setting, the principal’s preference of a 50/50 effort allocation takes the form of a fiduciary duty. If the ethical norm is to follow this fiduciary duty, then an agent with (congruent) ethical concerns enforced by conscience has internal incentives to allocate effort to Task B.

If the internal discomfort of conscience-driven ethical concerns and the public embarrassment of social incentives are unrelated to each other, then ethical concerns and social incentives will act as substitutes.15 The reason for this is the following. Congruent social incentives have decreasing marginal benefits, since they increase the effort allocation to Task B at a decreasing rate.16 Given that congruent ethical concerns increase the effort allocation to Task B, the marginal impact of social incentives on effort allocation will be lower the greater the ethical concerns, i.e., there is less to be gained from social incentives. As a result, if conscience-driven ethical concerns and social incentives are alternative incentive mechanisms, then congruent ethical concerns have a positive direct (main) effect on the effort allocated to the unmeasured task and a negative interaction effect with congruent social incentives.

Another mechanism that can enforce ethical norms is social incentives, in which case the social context affects the disutility from not behaving ethically (Noreen 1988). If the social norm is similar to the individual’s ethical norm, then the public embarrassment associated with social incentives clarifies the potential negative consequences of unethical behavior and thereby increase any internal discomfort. In the context of our study, this implies that congruent ethical concerns mitigate the effort distortions caused by financial incentives.

We define “congruent ethical concerns” as an agent’s concern with an ethical norm that is equal to the principal’s preference, which in our case is a 50/50 effort allocation.

Based on Equation (10), the following applies:

\[
\frac{\partial \alpha^e}{\partial \lambda} > 0; \quad \frac{\partial^2 \alpha^e}{\partial \lambda^2} < 0.
\]

That is, the impact of congruent social incentives (\(\lambda\)) on the effort allocated to Task B (\(\alpha\)) is increasing and concave.

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incentives to a greater extent if the agent is also exposed to congruent social incentives. More importantly, this implication also holds in reverse. Congruent social incentives mitigate the effort distortions caused by financial incentives to a greater extent if the agent is also ethically concerned with an equal effort allocation across tasks. In essence, if the agent believes that the social norm is not ethical according to his individual norm, then he is less embarrassed to admit that he deviated from the social norm and, thus, incurs less cost of noncompliance. As a result, ethical concerns and social incentives act as complements, in the sense that having one increases the usefulness of having the other to induce a more equal effort allocation across tasks, which implies a positive interaction effect on the effort allocated to the unmeasured task.\footnote{Under the assumption that a more even effort allocation always increases the value to the agency, congruent ethical concerns and congruent social incentives are Edgeworth complements (Milgrom and Roberts 1995).}

In sum, the above discussion predicts that, in the presence of financial incentives, ethical concerns increase the agent’s effort allocation to Task B.\footnote{Note that, similar to social incentives, ethical concerns do not affect the agent’s optimal responses in the presence of fixed wages, because in this setting there is no trade-off between effort level and effort allocation.} The analysis further provides conflicting predictions regarding the interaction between ethical concerns and social incentives. Given these conflicting predictions, we state the following (alternative) hypotheses:

\textbf{H4: } In the presence of distorting financial incentives, congruent ethical concerns have a positive effect on the relative effort allocated to the unmeasured task.

\textbf{H5a: } In the presence of distorting financial incentives, congruent ethical concerns and congruent social incentives negatively interact to affect the relative effort allocated to the unmeasured task (substitution hypothesis).

\textbf{H5b: } In the presence of distorting financial incentives, congruent ethical concerns and congruent social incentives positively interact to affect the relative effort allocated to the unmeasured task (complementarity hypothesis).

**EXPERIMENTAL METHOD**

To test the hypotheses, we conduct a laboratory experiment. The experimental design is a completely randomized $2 \times 2$ factorial design. As shown in Panel A of Table 1, there are two independent variables, i.e., congruent social incentives and compensation scheme, resulting in four treatments. In total 77 business students, 36 female and 41 male, participate in the experiment, all of whom are randomly assigned to one of the four treatment groups. The average age of the participants is 22.5 years.

We chose to design a single-period experiment for the following two reasons. First, as mentioned by Bonner et al. (2000), with complex tasks, learning and strategy development takes time and requires multiple periods. Our experimental task, which will be described below, is simple and does not require any such learning or strategy development to take place. Second, a component of the congruent social incentive manipulation is communicating to participants “what is desirable,” and a single-period experiment avoids the problem that a social norm will be endogenously determined during the course of the experiment. As the focus of the study is on congruent social incentives, we want to avoid an endogenous development of a social norm over the course of the experiment. Although such developments are interesting, they are also problematic for the purpose of this paper, since these are not only uncontrollable by the experimenter, but most likely also unobservable in our setting.
Experimental Task

We use a rather abstract task similar to tasks in experiments by Hannan et al. (2002) and Hannan (2005). Participants are asked to choose an overall effort level. To simulate the concept of cost of effort, participants incur personal costs of effort that are subtracted from their final compensation. Panel B of Table 1 shows the effort levels and the related costs. Minimum effort level is 1 and the maximum effort level is 9. According to economic theory, individuals have under fixed wages ($10) no incentive to deliver high levels of effort and commit to corresponding high costs of effort, so that money-maximizing individuals will choose an effort level of 1 and minimize their costs of effort ($0.56). Under financial incentives of €2 per effort level, individuals maximize their monetary payoff by choosing the maximum effort level with associated costs of effort of €8.56. The maximum monetary payoff under either fixed wages or financial incentives is therefore €9.44.

After having chosen an overall effort level, participants need to allocate this effort level to two tasks, Task A and Task B, by indicating a percentage on a decision form. Output is measured (and in the financial incentive conditions compensated) only on Task A. Participants are told that they are working for a firm, whose long-term value is maximized if effort is equally allocated between the two tasks. In contrast to public goods experiments, but consistent with our theory and hypothesis development, the overall well being of the firm as well as effort on Task B is not contractible in this setting (cf., Holmstrom and Milgrom 1991).

Experimental Procedure

Participants arrive at the setting and draw an experimental code (for reasons of anonymity). After having taken a seat at one of the tables in the laboratory, participants receive an envelope with the instructions and the experimental material.

No Social Incentives and Fixed Wage/Distorting Financial Incentives

Participants work individually separated from each other by walls. In a fixed wage treatment, participants receive a wage of €10 irrespective of how they allocate their effort. In the financial incentive treatment, participants receive €2 per allocated “unit” of effort to Task A, but nothing for effort allocated to Task B. The costs of effort are subtracted from the compensation in all compensation treatments.

Social Incentives and Fixed Wage/Distorting Financial Incentives

The social incentive treatment is similar to that in King (2002). Before the start of the experiment, participants are asked to introduce each other. To stimulate group cohesion and to facilitate a social identity among participants as one condition for social incentives to exist, we use the term “team” in the instructions. Participants are asked to find a name for

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19 For reasons of clarity to the participants, the overall effort level in the experiment is expressed in discrete units. Given the use of discrete units of overall effort, the cost of effort function in Panel B of Table 1 is consistent with the cost of effort function in Equation (1). We use a more general notation and continuous overall effort in the economic model for the mere reason of tractability. In essence, there is no substantive difference between the cost of effort function in the model and the cost of effort function in the experiment.

20 Note that, if the long-term value of the firm would be contractible, then this would make the observation that performance on Task B cannot be measured a somewhat trivial issue. In that case, we could address the trade-off of interest to this paper by explicitly contracting on the gross payoff and a measure of Task A. Thus, there would be (almost) no role for social incentives in addressing the trade-off. Furthermore, most of the issues in the seminal paper by Holmstrom and Milgrom (1991) exist because the gross payoff to the principal is not contractible and the noncontractibility assumption therefore lies at the heart of the multi-tasking literature. The noncontractibility per se, however, does not prohibit the principal from communicating her preferences to the agent.
their group. After that, participants take a seat and receive the envelope with the instructions and the experimental material. Individuals sit at separate tables, but are not separated by walls. Following King (2002) and Towry (2003), the effort allocation of each group member in percentages is posted on a board for all members of the group to see in order to simulate mutual monitoring. This was communicated to the participants before the start of the experiment. The one with the strongest effort distortion, i.e., the one with the lowest percentage of effort allocated to the unmeasured task, needs to explain his/her effort allocation to the others and this was also communicated ex ante.21

At the end of the experiment, participants complete an exit questionnaire. Aside from demographic information, manipulation checks are included. There is one dichotomous question as manipulation check for the compensation treatment and two statements that participants evaluate based on a seven-point Likert scale (“do not agree at all” to “strongly agree”) as manipulation check for the social incentive treatment. Furthermore, ethical concerns are measured by a question similar to Stevens (2002).22 After having completed the exit questionnaire, the experiment is over. Participants pick up their compensation in a closed envelope in cash based on their experimental ID. Average actual pay per participant is €6.94 and the experiment lasts about 30 minutes.

**Dependent Variables**

The dependent variable in our analysis focuses on the effort choice. Effort is a construct of several dimensions: intensity, direction, duration, and strategy development (Bonner and Sprinkle 2002). We consider effort intensity and direction only in this experiment, because the dimensions duration and strategy development are not an issue in our experiment due to the short time frame and the simplicity of the experimental task, respectively. Effort intensity is reflected by the overall effort level and we measure this by the participants’ chosen total effort level. Effort direction is reflected by the effort allocation and we measure this by the percentage of total effort allocated to Task B by each participant.

**RESULTS**

**Manipulation Checks**

The manipulation checks with respect to the social incentive manipulation indicate that participants in the social incentives treatments perceived themselves more as a team member ($t = 1.99; p < 0.05$) and more subject to (potential) social pressure ($t = 4.25; p < 0.01$) as compared to the other treatments.23 The manipulation check for the compensation system treatment indicates that all but six participants correctly understood the way they were compensated. We include these six participants in all of our analysis; robustness checks indicate that none of our results are sensitive to their inclusion.

**Descriptive Statistics**


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21 In case of more than one participant with equally distorted effort allocation, more than one person has to explain.
22 The question used is: “Ignoring the goal of the company would be unethical.”
23 To test this, we use the answers to the following two questions: (1) the others in the room and I form one production team and (2) if I allocated no effort to Task B, others in the group will find that out for sure.
The average chosen effort level in the experiment is 5.08 and ranges from 2.70 in treatment Fixed Wage/No Social Incentives to 7.48 in the treatment Distorting Financial Incentives/No Social Incentives. These results show that, even in the absence of financial incentives, not all participants completely shirked. More specifically, in the fixed wage treatments, 41 percent of the participants provided the lowest effort possible. Overall, participants allocated 36 percent of their total effort to Task B, ranging from 17 percent in the treatment Distorting Financial Incentives/No Social Incentives to 51 percent in both Fixed Wage treatments. In the two Fixed Wage treatments all participants allocated some effort to Task B, while in the Distorting Financial Incentives/No Social Incentives treatment 48 percent of the participants allocated no effort to Task B. This number is significantly reduced in the Distorting Financial Incentives/Social Incentives treatment, where only 24 percent of the participants allocated no effort at all to Task B. These results show that, even in the absence of social incentives, distorting financial incentives did not lead all participants to completely ignore the unmeasured task and act fully opportunistically (cf., Chow et al. 1988; Stevens 2002). For these participants, it seems that a fiduciary duty to act at least partially in line with the principal's preference prevented them from acting fully opportunistically.

The results further show that, on average, the participants did not maximize their monetary payoff. Participants in the Fixed Wage treatments earned the most, with participants in the treatment Fixed Wage/No Social Incentives (Fixed Wage/Social Incentives) earning €8.22 (€8.07), which is 87 percent (85 percent) of the maximum payoff of €9.44. Participants in the Distorting Financial Incentives/Social Incentives (Distorting Financial Incentives/No Social Incentives) treatment earned on average €4.93 (€6.32), which is only 52 percent (67 percent) of the maximum payoff. This indicates that, within the context of this experiment, participants "gave up" a significant amount of money when exposed to financial incentives and social incentives.

Finally, the average ethical concerns of the participants equals 4.68 (seven-point Likert scale) and a one-way ANOVA indicates that there are no significant differences among the four treatments.

**Hypothesis 1**

The pattern of the means over the different treatments, shown in Panel A of Table 2, is consistent with H1. That is, the effort level is, on average, lowest in the two Fixed Wage conditions (2.70 and 3.05), higher in the Distorting Financial Incentives/Social Incentives condition (7.18), and highest in the Distorting Financial Incentives/No Social Incentives condition (7.48). An ANOVA with distorting financial incentives and social incentives as factors shows a significant main effect for distorting financial incentives, but no significant interaction effect between distorting financial and social incentives (Panel B of Table 2). Given that H1 predicts a specific form of ordinal interaction, i.e., an ordering of means, we use contrast coding to test the hypothesis (Buckless and Ravenscroft 1990; Rosnow and Rosenthal 1995; Kadous et al. 2003). Following our H1, we use the contrast weights 3, 1, and −2 for the conditions Distorting Financial Incentives/No Social Incentives, Distorting Financial Incentives/Social Incentives, and Fixed Wage/(No) Social Incentives, respectively.

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24 Almost no participant in the financial incentives treatment chose the maximum effort level, which is one condition for a maximum payoff. Further, whereas effort allocation did not influence payoff in the fixed wage treatments, it determined the final payoff in the financial incentive treatments. Most participants in the financial incentives treatments allocated at least some effort to Task B, which further reduced their payoff.
TABLE 2
Results of the Impact of Distorting Financial Incentives and Social Incentives on Effort Level

Panel A: Average Effort Level per Treatmenta

<table>
<thead>
<tr>
<th></th>
<th>No Social Incentives</th>
<th>Social Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Wage</td>
<td>2.70 (n = 20)</td>
<td>3.05 (n = 19)</td>
</tr>
<tr>
<td>Distorting Financial Incentives</td>
<td>7.48 (n = 21)</td>
<td>7.18 (n = 17)</td>
</tr>
</tbody>
</table>

Panel B: ANOVA with Treatment as Between Factor

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distorting Financial Incentives</td>
<td>1</td>
<td>384.621</td>
<td>384.621</td>
<td>104.32</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Social Incentives</td>
<td>1</td>
<td>0.020</td>
<td>0.020</td>
<td>0.01</td>
<td>0.941</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>2.035</td>
<td>2.035</td>
<td>0.55</td>
<td>0.460</td>
</tr>
<tr>
<td>Error</td>
<td>73</td>
<td>268.856</td>
<td>3.683</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C: Contrast Coding

<table>
<thead>
<tr>
<th>Hypothesized Contrast</th>
<th>df</th>
<th>X²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: The effort level is highest in the Distorting Financial Incentives/No Social Incentives condition, lower in the Distorting Financial Incentives/Social Incentives condition, and lowest in the two Fixed Wage conditions (contrast weights are 3, 1, −2, and −2 respectively).</td>
<td>1</td>
<td>99.06</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

a The dependent variable, effort level, is measured by the chosen level of effort, which ranges from 1 to 9.

(cf., Rosnow and Rosenthal 1995; Kadous et al. 2003).25 The results, presented in Panel C of Table 2, show that the hypothesized ordinal interaction is statistically significant (X² = 99.06, p < 0.01). The data therefore provide support for H1.

Although the actual ordering of the treatments is in accordance with the hypothesized ordering, the average effort level is not significantly different between the two financial incentives treatments (i.e., 7.48 is not significantly different from 7.18). It should be noted, however, that this lack of a difference is driven by some participants not allocating their effort in complete accordance with our model, which should theoretically affect their effort level. Approximately 50 percent of the participants in the Distorting Financial Incentives/No Social Incentives condition allocated some effort to Task B, while approximately 25 percent of the participants in the Distorting Financial Incentives/Social Incentives condition allocated zero effort to Task B. After eliminating these participants, the effort level in the Distorting Financial Incentives/No Social Incentives condition is significantly higher than in the Distorting Financial Incentives/Social Incentives condition (8.80 versus 6.62; p < 0.01), consistent with our model.

25 Our results are robust to using alternative weights with the same ordering. For completeness, note that the interaction effect in a “standard” ANOVA has the contrast weights −1, 1, 1, −1 for the treatments Fixed Wage/No Social Incentives, Fixed Wage/Social Incentives, Distorting Financial Incentives/No Social Incentives, and Distorting Financial Incentives/Social Incentives, respectively. See for more discussion about the difference between contrast coding and ANOVA, for example, Buckless and Ravenscroft (1990).
Hypothesis 2

Similar to the effort level, the pattern of the means of effort allocation over the different treatments is as hypothesized (see Panel A of Table 3). That is, the effort allocated to Task B is, on average, lowest in the Distorting Financial Incentives/No Social Incentives condition (17 percent), higher in the Distorting Financial Incentives/Social Incentives condition (27 percent), and highest in the two Fixed Wage conditions (51 percent without and 52 percent with social incentives). Results of an ANOVA with distorting financial incentives and social incentives as factors are given in Panel B of Table 3. The results show only a significant main effect of distorting financial incentives. To specifically statistically test the ordinal interaction stated in H2, we use contrast coding and use the contrast weights $-3$, $-1$, and $2$ for the conditions Distorting Financial Incentives/No Social Incentives, Distorting Financial Incentives/Social Incentives, and Fixed Wage/(No) Social Incentives, respectively. The results, presented in Panel C of Table 3, show that the hypothesized ordinal interaction is statistically significant ($\chi^2 = 70.60, p < 0.01$). The data therefore provide support for H2.

In both the hypothesis development and the statistical tests that support this hypothesis, we focus on the ordering of the effort on Task B as a percentage of overall effort. In an additional analysis, we examine the effort level on Tasks B and A. The model presented in

| TABLE 3 |
| Results of the Impact of Distorting Financial Incentives and Social Incentives on Effort Allocation |

<p>| Panel A: Average Effort Allocation per Treatment |</p>
<table>
<thead>
<tr>
<th>No Social Incentives</th>
<th>Social Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Wage</td>
<td></td>
</tr>
<tr>
<td>Task B (A): 51% (49%) (n = 20)</td>
<td>Task B (A): 52% (48%) (n = 19)</td>
</tr>
<tr>
<td>Distorting Financial Incentives</td>
<td></td>
</tr>
<tr>
<td>Task B (A): 17% (83%) (n = 21)</td>
<td>Task B (A): 27% (73%) (n = 17)</td>
</tr>
</tbody>
</table>

<p>| Panel B: ANOVA with Treatment as Between Factor$^a$ |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distorting Financial Incentives</td>
<td>1</td>
<td>16372.348</td>
<td>16372.348</td>
<td>66.24</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Social Incentives</td>
<td>1</td>
<td>574.959</td>
<td>574.959</td>
<td>2.33</td>
<td>0.132</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>513.512</td>
<td>513.512</td>
<td>2.08</td>
<td>0.154</td>
</tr>
<tr>
<td>Error</td>
<td>73</td>
<td>18043.310</td>
<td>247.169</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Panel C: Contrast Coding$^a$ |</p>
<table>
<thead>
<tr>
<th>Hypothesized Contrast</th>
<th>df</th>
<th>$\chi^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: The effort allocated to Task B is lowest in the Distorting Financial Incentives/No Social Incentives condition, higher in the Distorting Financial Incentives/Social Incentives condition, and highest in the two Fixed Wage conditions (contrast weights are $-3$, $-1$, 2, and 2 respectively).</td>
<td>1</td>
<td>70.60</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

$^a$The dependent variable, effort allocation, is measured by the amount of effort allocated to the unmeasured task (Task B) relative to overall effort.
The Role of Financial Incentives and Social Incentives in Multi-Task Settings

The theory section is ambiguous regarding the ordering of the treatments regarding the effort level on Task B and predicts that (1) $B^o_β < B^o_β$, $B^o_λ$, $B^o$, (2) $B^o_{μλ} \leq B^o_λ$, $B^o$, and (3) $B^o_λ = B^o$. The descriptive statistics in Panel A of Table 4 are in line with these predictions. Pairwise comparison of effort levels across treatments, presented in Panel B of Table 4, show that the level of effort on Task B in the Distorting Financial Incentives/Social Incentives treatment, which is the highest, and in the Distorting Financial Incentives/No Social Incentives treatment, which is the lowest, are significantly different ($p < 0.10$, one-tailed). Further, effort on Task B in the Distorting Financial Incentives/No Social Incentives treatment is also significantly lower than in the Fixed Wage/Social Incentives treatment ($p < 0.10$, one-tailed). All other differences, however, are not statistically significant.

Regarding the level of effort on Task A, the model predicts that $A^o_β > A^o_β > A^o_λ = A^o$. Panel B of Table 4 provides the pairwise comparisons of the effort level on Task A across treatments and Panel C of Table 4 provides the test of the model-predicted contrast. Both the results of the pairwise comparisons and the results of the contrast coding provide support for the ordering predicted by our theoretical model.

Overall, these results indicate that, although financial incentives lead to an effort distortion in a relative sense, the level of effort on the unmeasured task is not significantly different from a setting with fixed wages. As a result, the “distortion” is, on average, driven

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**TABLE 4**

Results of the Impact of Distorting Financial Incentives and Social Incentives on the Level of Effort per Task

**Panel A: Average Effort Levels per Task per Treatment**

<table>
<thead>
<tr>
<th></th>
<th>No Social Incentives</th>
<th>Social Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Wage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task A (A)</td>
<td>1.35</td>
<td>Task A (A)</td>
</tr>
<tr>
<td>Task B (B)</td>
<td>1.35 ($n = 20$)</td>
<td>1.45 ($n = 19$)</td>
</tr>
<tr>
<td>Distorting Financial Incentives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task A (A)</td>
<td>6.41 ($n = 21$)</td>
<td>Task A (A)</td>
</tr>
<tr>
<td>Task B (B)</td>
<td>1.07 ($n = 21$)</td>
<td>1.72 ($n = 17$)</td>
</tr>
</tbody>
</table>

**Panel B: Pairwise Comparison of Effort Levels across Treatments**

<table>
<thead>
<tr>
<th>Task A</th>
<th>p-value</th>
<th>Task B</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A versus $A_λ$</td>
<td>0.876</td>
<td>B versus $B_λ$</td>
<td>0.540</td>
</tr>
<tr>
<td>A versus $A_β$</td>
<td>0.000</td>
<td>B versus $B_β$</td>
<td>0.243</td>
</tr>
<tr>
<td>A versus $A_{μλ}$</td>
<td>0.000</td>
<td>B versus $B_{μλ}$</td>
<td>0.381</td>
</tr>
<tr>
<td>$A_λ$ versus $A_{μλ}$</td>
<td>0.000</td>
<td>$B_λ$ versus $B_{μλ}$</td>
<td>0.781</td>
</tr>
<tr>
<td>$A_λ$ versus $A_β$</td>
<td>0.000</td>
<td>$B_λ$ versus $B_β$</td>
<td>0.097</td>
</tr>
<tr>
<td>$A_β$ versus $A_{μλ}$</td>
<td>0.075</td>
<td>$B_β$ versus $B_{μλ}$</td>
<td>0.061</td>
</tr>
</tbody>
</table>

**Panel C: Contrast Coding**

<table>
<thead>
<tr>
<th>Model-Predicted Contrast</th>
<th>df</th>
<th>$χ^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_β &gt; A_{μλ} &gt; A_λ = A$</td>
<td>1</td>
<td>101.45</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

*a The p-values are one-tailed if there is a clear prediction and two-tailed otherwise.
by doing more of Task A rather than doing less of Task B (in an absolute sense), which is in contrast to the common criticism on financial incentives.

**Hypothesis 3**

Hypothesis 3 states that, within the treatment Distorting Financial Incentives/Social Incentives, there is a negative cross-sectional correlation between the effort level and the allocation to the unmeasured task. Over all treatments, the correlation between the effort level and effort allocation across the different treatments. The correlation structure within the treatment Distorting Financial Incentives/Social Incentives is $-0.77$ ($p < 0.01$). This finding is consistent with our expectation and the data thus provide support for H3.

**Hypothesis 4**

Hypothesis 4 states that, in the presence of distorting financial incentives, congruent ethical concerns increase the effort allocated to the unmeasured task, while H5 states ethical concerns and social incentives interact to affect the effort allocation (H5a: negative interaction; H5b: positive interaction). To test H4 and H5, we use the following empirical specification (Model M1):

$$
\text{Effort Allocations} = \gamma_0 + \gamma_1 D_{FI} + \gamma_2 D_{SI} + \gamma_3 \text{Ethical Concerns} \\
+ \gamma_4 D_{FI} \times D_{SI} + \gamma_5 D_{FI} \times \text{Ethical Concerns} \\
+ \gamma_6 D_{SI} \times \text{Ethical Concerns} \\
+ \gamma_7 D_{FI} \times D_{SI} \times \text{Ethical Concerns} + \epsilon
$$

where $D_{FI}$ ($D_{SI}$) is a dummy variable that equals 1 if the treatment is Distorting Financial Incentives (Social Incentives), and 0 otherwise. The intercept reflects the treatment Fixed Wage/No Social Incentives. Support for H5 is found when $\gamma_5 > 0$ and $\gamma_5 + \gamma_7 > 0$. Support for H5a (H5b) is found when $\gamma_5 < 0$ ($\gamma_7 > 0$).

The results for Model M1 are presented in Panel A of Table 5. Results show that neither the coefficient $\gamma_5$ nor $\gamma_5 + \gamma_7$ is significantly different from zero. These findings are inconsistent with H4 and indicate that conscience by itself is not a sufficiently effective enforcement mechanism for ethical concerns. Regarding H5, the results show that the coefficient $\gamma_7$ is positive and significant ($t = 1.94$; $p < 0.10$). That is, congruent ethical concerns and congruent social incentives positively interact to affect the effort allocation to Task B. This finding is consistent with H5b and indicates that ethical concerns and social incentives act as complements. Overall, the results from Model M1 imply that without an environment with social incentives, ethical concerns do not affect behavior because of the absence of a sufficient punishment for unethical behavior.

Given the complexity of a three-way interaction (Hartmann and Moers 1999) and to further examine the above implication, we examine the following model (Model M2):

$$
\text{Effort Allocation} = \gamma_0 + \gamma_1 D_{FISI} + \gamma_2 D_{FWSI} + \gamma_3 D_{FWNSI} + \gamma_4 \text{Ethical Concerns} \\
+ \gamma_5 D_{FISI} \times \text{Ethical Concerns} + \epsilon
$$

Note that the variable Ethical Concerns is centered, which implies that all lower-order effects are effects at the (sample) average of ethical concerns (Hartmann and Moers 1999).
### TABLE 5
OLS Regression of Effort Allocation on Distorting Financial Incentives, Social Incentives, and Ethical Concerns
(n = 77)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Predicted sign</th>
<th>Effort Allocationa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Results for Model M1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interceptb</td>
<td>+</td>
<td>50.39***</td>
</tr>
<tr>
<td>DFI</td>
<td>−</td>
<td>−33.90***</td>
</tr>
<tr>
<td>DSib</td>
<td>0</td>
<td>0.52</td>
</tr>
<tr>
<td>Ethical Concernsb</td>
<td>0</td>
<td>−0.16</td>
</tr>
<tr>
<td>DFI × DSib</td>
<td>+</td>
<td>7.90</td>
</tr>
<tr>
<td>DFI × Ethical Concernsb</td>
<td>+</td>
<td>0.97</td>
</tr>
<tr>
<td>DSib × Ethical Concernsb</td>
<td>?</td>
<td>−1.55</td>
</tr>
<tr>
<td>DFI × DSib × Ethical Concernsb</td>
<td>−/+</td>
<td>6.53*</td>
</tr>
<tr>
<td>Adjusted R2b</td>
<td></td>
<td>0.48</td>
</tr>
<tr>
<td><strong>Panel B: Results for Model M2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interceptc</td>
<td>+</td>
<td>16.76***</td>
</tr>
<tr>
<td>DFISI</td>
<td>+</td>
<td>8.15</td>
</tr>
<tr>
<td>DFWSI</td>
<td>+</td>
<td>34.13***</td>
</tr>
<tr>
<td>DFWNSI</td>
<td>+</td>
<td>33.62***</td>
</tr>
<tr>
<td>Ethical Concernsc</td>
<td>0</td>
<td>−0.17</td>
</tr>
<tr>
<td>DFISI × Ethical Concernsc</td>
<td>+</td>
<td>5.96***</td>
</tr>
<tr>
<td>Adjusted R-squarec</td>
<td></td>
<td>0.53</td>
</tr>
</tbody>
</table>

***, **, * Statistically significant at the 1 percent, 5 percent, and 10 percent levels, respectively, (two-tailed) based on White-adjusted standard errors.

a The dependent variable, effort allocation, is measured by the amount of effort allocated to the unmeasured task (Task B) relative to overall effort.
b The intercept reflects the treatment Fixed Wage/No Social Incentives, which is used as the benchmark setting.
c The intercept reflects the treatment Distorting Financial Incentives/No Social Incentives, which is used as the benchmark setting.

DFI(DSI) = indicator variable that equals 1 if the treatment is Distorting Financial Incentives (Social Incentives), and 0 otherwise; and DFISI, DFWSI, and DFWNSI = indicator variable that equals 1 if the treatment is Distorting Financial Incentives/Social Incentives, Fixed Wage/Social Incentives, and Fixed Wage/No Social Incentives, respectively, and 0 otherwise.

where DFISI is a dummy variable that equals 1 if the treatment is Distorting Financial Incentives/Social Incentives, and 0 otherwise; and DFWSI (DFWNSI) is a dummy variable that equals 1 if the treatment is Fixed Wage/Social Incentives (Fixed Wage/No Social Incentives), and 0 otherwise. This model tests the influence of ethical concerns on effort allocated to the unmeasured task in the Distorting Financial Incentives/Social Incentives treatment versus all other treatments. The model further allows us to more clearly examine the impact of Distorting Financial Incentives/Social Incentives at different levels of ethical concerns and therefore addresses the question of whether social incentives by themselves are a sufficient punishment.

Results of Model M2 are shown in Panel B of Table 5. The significant result for the interaction term DFI × Ethical Concerns indicates that ethical concerns have a more...
positive effect on effort allocated to the unmeasured task in the Distorting Financial Incentives/Social Incentives treatment than in the other treatments \((t = 2.90; p < 0.01)\). Furthermore, the main effect for ethical concerns indicates the effect of ethical concerns in the other treatments, which is not significantly different from zero. This result is consistent with the previous finding that ethical concerns by themselves do not provide sufficient incentives.

To analyze whether social incentives by themselves provide a sufficient penalty, we use the results of Model M2 to estimate the effort allocated to Task B in the Distorting Financial Incentives/Social Incentives treatment for different levels of ethical concerns. When participants score very low on ethical concerns, the estimated effort allocated to Task B equals approximately 3.63 percent and this effort allocation increases at a rate of 5.79 percent per “unit” of ethical concerns to approximately 38.37 percent when participants score very high on ethical concerns.\(^{27}\) These results show that, as with ethical concerns, social incentives by themselves are insufficient. Social incentives can only mitigate the effort distortion problem due to financial incentives if agents have congruent ethical concerns. The results further indicate that the observed effects of social incentives and ethical concerns are economically significant in addition to being statistically significant.

**CONCLUSION**

In a \(2 \times 2\) experiment with two tasks, we find that participants who receive financial incentives on one task significantly reduce their effort on the other task, which is consistent with agency theory (e.g., Holmström and Milgrom 1991). Results of this study show that participants who receive a fixed wage allocate their effort in accordance with the principal’s objective, which is also consistent with Holmström and Milgrom’s (1991) model. However, these participants provide significantly less overall effort than those who receive financial incentives, and more importantly, participants do not allocate more absolute effort to the unmeasured task under fixed wages than under financial incentives; instead, they allocate less effort to the measured task. Thus, in this setting, fixed wages are beneficial for relative effort allocation, but are not beneficial for effort levels. These results show that the principal needs to trade-off higher (lower) effort levels with less (more) congruent effort allocations. Further, we find that ethical concerns (individual norms) and social incentives (group norms) reinforce each other. Social incentives act as an enforcement mechanism for participants to behave in accordance with their ethical norms, while ethical concerns act as a mechanism to enforce the social norm.

This study is subject to a number of limitations. As with most experiments, the generalization of the results and the external validity is a valid concern. In addition, communication between the participants was not allowed. Social incentives may have even stronger effects and reputation concerns may play a stronger role when participants can actively communicate with each other. Further, long-term considerations, such as job security and career concerns, are not considered here although they likely play an important role. Future research could take these aspects into account. Finally, we restrict our financial incentives construct to a simple linear incentive contract, even though effort allocation might also be affected by other forms of compensation, such as the allocation of ownership rights.

Despite these limitations, our paper contributes to the literature in several ways. Aside from being one of the first studies to examine a multi-task agency setting experimentally,

\[^{27}\text{Very low ethical concerns equals a score of 1 on the seven-point Likert scale (4.2 percent of participants), while very high ethical concerns equals a score of 7 on the seven-point Likert scale (18.3 percent of participants).}\]
the study provides support for the important role of both social norms and individual norms for individual decision making. We show a setting where financial incentives might be preferred over fixed wages even though performance on one task is not measured. Further, we show that ethical concerns and social incentives act as complements in mitigating agency problems and that the use of these mechanisms comes at a cost to the principal. Finally, findings of this study stress that the agency problem is not solely about inducing effort or solely about inducing the “right” allocation; it is the combination of these choices that matters.

Our study also has several implications. We manipulate the social incentives to be consistent with the principal’s objective, i.e., congruent social incentives, and the results provide a plausible explanation for why we observe financial incentives in multi-task settings where parts of the agent’s job cannot be measured. The implications of our results, however, extend beyond the experimental setting. The results imply not only that social incentives can mitigate the potential distorting effects of financial incentives, but also the reverse. That is, if social incentives are present within (parts of) a firm that are not consistent with the principal’s objective, then financial incentives can mitigate the distorting effects of these noncongruent social incentives. The typical example in this respect is holding scientists in R&D responsible for financial results because they are in the pursuit of knowledge, while the firm is in the pursuit of marketable products and making a profit (see e.g., Ferreira and Merchant 1989). Paying these scientists a fixed wage will lead them to allocate too much effort to research for the sake of research and not enough to the development of profitable products. In these circumstances, financial incentives can lead to a more balanced effort allocation that is consistent with the firm’s objectives.

Our results further imply that if financial incentives and social incentives go in the same direction, then this can be problematic. For example, if financial incentives are provided to meet or beat performance targets and the social norm is that you should live up to expectations, i.e., meet or beat the target, then the focus will be solely on the better-measured aspects of the job to the detriment of the aspects that are more difficult to measure. As soon as the latter aspects are very important, as in the model of Holmstrom and Milgrom (1991), then a focus on the better-measured aspects of a job will deteriorate overall firm performance and might ultimately lead to bankruptcy.

Finally, our results have implications for the selection of employees by firms. Financial incentives are not only used to increase effort but also to attract the “right” people for the “right” job, especially at higher hierarchical levels characterized by multi-tasking. At these higher hierarchical levels, incentive contracts are unlikely to be complete. Given that social incentives and ethical concerns increase the value of these incentives, firms need to take the employees’ “personality” into account in personnel decisions. In particular, firms need to place a higher weight on the coherence of a candidate’s internal values with firm values and the candidate’s sensitivity to peer pressure.

From a theoretical perspective, our paper shows the importance of incorporating non-financial incentives into agency models, as is done by, for example, Fischer and Huddart (2004) and Stevens and Thevaranjan (2003). More specifically, our results indicate that, as soon as individuals are open to more nonfinancial incentives, they actively trade-off effort intensity and effort allocation. One opportunity for future research is thus to extend the basic multi-tasking model of Holmstrom and Milgrom (1991) to include these individually and/or socially driven motivations and analyze analytically how the trade-off between effort intensity and effort allocation affects the design of optimal contracts. For example, Stevens and Thevaranjan (2003) incorporate ethics into a single-task agency model to show that fixed wages are preferred over financial incentives when agents are “ethically sensitive”
and promise to deliver a predetermined standard level of effort. However, the question is raised whether their results hold in a multi-task setting where ethically sensitive agents promise to deliver a predetermined standard allocation of effort and the trade-off between effort intensity and effort allocation comes into play.

A further extension would be to allow the social norm to be endogenously determined, as in Fischer and Huddart (2004), who analyze a setting in which a single performance measure is affected by two actions, one of which is subject to an endogenously determined social norm. Their model could be adjusted to reflect the setting examined in this paper, i.e., a contractible performance measure that is affected by one task, a noncontractible performance measures that is affected by another task, and an effort allocation that is subject to an endogenously determined social norm. Analyzing such models could potentially provide more insights into the impact of social incentives on the optimal design of contracts, the selection of agents, or more broadly, the design of firms.

APPENDIX
THE PRINCIPAL-AGENT MODEL

In this appendix, we focus on the principal’s problem of designing optimal financial incentives in the presence of congruent social incentives. Assume that the principal’s gross payoff \( \Pi \) is characterized by:

\[
\Pi = f(A \cdot B) + \theta
\]  

(A1)

where \( A \) is effort on Task A, \( B \) is effort on Task B, \( \theta \) is a random shock, the variance of which is independent of the effort choice, and \( f(\cdot) \) is an increasing and concave function of the product of \( A \) and \( B \) with \( f(0) = 0 \), and \( f_A(\cdot) > 0 \), \( f_B(\cdot) > 0 \), \( f_{AB}(\cdot) > 0 \) for all \( A, B > 0 \). This gross payoff function is similar to that used by Holmström and Milgrom (1991, 34). Also consistent with (most of) the multi-task literature, we assume that neither the gross payoff nor its components \( f(\cdot) \) and \( \theta \) are contractible (see e.g., Holmström and Milgrom 1991; Feltham and Xie 1994). We can therefore disregard \( \theta \) in the remainder of the analysis without loss of generality.

Further, we assume the following:

1. Total effort level \( E \);
2. Effort allocation to \( B = \alpha \), with \( \alpha \in [0,1] \);
3. Effort on Task A \( = A = (1 - \alpha)E \);
4. Effort on Task B \( = B = \alpha E \).

Based on these assumptions and notations, we rewrite (A1) into:

\[
\Pi(\alpha,E) = f((\alpha - \alpha^2)E^2)
\]  

(A2)

with \( \Pi(1,E) = \Pi(0,E) = \Pi(\alpha,0) = 0 \) and \( f_E > 0 \) and \( f_{EE} < 0 \) for all \( 0 < \alpha < 1 \). Holding the effort level constant, the effort allocation that maximizes the gross payoff is \( \alpha = 1/2 \) and thus, absent any cost associated with this allocation, the principal prefers an equal effort allocation across both tasks. If, however, the effort level and effort allocation are related, i.e., there exists a trade-off, then it might be optimal for the principal to allow for

---

28 In this Appendix, subscripts denote partial derivatives.

29 In moral hazard models, it is typically assumed that \( \theta \) is unobservable, in which case it is a relevant parameter if the outcome to which it applies is contractible. That is, if the gross payoff would be contractible, \( \theta \) would be relevant because of risk-sharing issues. These risk-sharing issues, however, are irrelevant as soon as the gross payoff is not contractible, which is why we can disregard it.

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a distorted effort allocation combined with a high effort level.\textsuperscript{30} It is this trade-off that is relevant for the principal in designing optimal financial incentives in the presence of social incentives.

The agent chooses total effort $E$ and effort allocation $\alpha$, both of which are unobservable to the principal. We assume that the agent is willing to provide some effort in the absence of financial incentives (cf., Holmström and Milgrom 1991, 33–34) and for simplicity we assume the following cost of effort function:

$$C(E) = c + \frac{1}{2}E^2 - kE \quad \text{with } c,k > 0$$  \hspace{1cm} (A3)

where $c$ is a given fixed cost and $k$ is the level of effort that the agent is willing to provide in the absence of financial incentives. This function indicates that the cost of effort is driven by the effort level and not the effort allocation (cf., Holmström and Milgrom 1991). In our setting, the direct cost related to the effort allocation is caused by the cost of not complying with a social norm. The cost of noncompliance is presented by the following function:

$$L(\alpha) = \frac{1}{2}(\alpha^m - \alpha)^2$$  \hspace{1cm} (A4)

where $\lambda$ is nonnegative and reflects the extent to which the agent is exposed to social incentives, and $\alpha^m$ is the social norm of effort allocation to Task B.

The agent’s performance can only be measured, for contracting purposes, on Task A (cf., Holmström and Milgrom 1991, 34) and this performance measure is characterized by:

$$y = A + \epsilon = (1 - \alpha)E + \epsilon \quad \text{with } \epsilon \sim N(0,\sigma^2)$$  \hspace{1cm} (A5)

where the variance of $\epsilon$ is independent of the effort choice. To keep the analysis focused on the trade-off between effort level and effort allocation, we ignore any risk-sharing issues by assuming that $y$ is a perfect measure of Task A, i.e., $\sigma^2 = 0$. The mere fact that $y$ is a perfect measure of A does not help the principal in any way, in terms of being able to "fix" the trade-off. To see this, assume that the principal would design a forcing contract where she pays the agent his reservation wage if $y = A^{FB}$ and a sufficient penalty otherwise, where $A^{FB} = (1 - \alpha^{FB})E^{FB}$ with $0 < \alpha^{FB} < 1$ (note: $FB$ is First-Best). The optimal response by the agent would then be to set $y$ equal to the value of $(1 - \alpha^{FB})E^{FB}$ by setting $\alpha^o = 0$ and $E^o = (1 - \alpha^{FB})E^{FB}$. But then $\Pi(0,\cdot) = 0$ and we are back at the root of the problem; the reason for this is that the effort allocation and effort level are jointly unobservable. As a result, the trade-off that we are interested in is still very much alive when we assume the existence of a perfect measure for Task A. The benefit, however, of ignoring risk-sharing issues is that we can avoid unnecessary complexities that would add little to nothing to our inferences.\textsuperscript{31}

Finally, the agent is compensated using a linear incentive contract based on performance measure $y$:

$$s(y) = w + \beta y$$  \hspace{1cm} (A6)

where $w$ is a fixed wage and $\beta$ is the incentive weight. Given all of the above, the principal’s maximization problem can be presented by:

\textsuperscript{30} For example, for some $0 < \alpha < \frac{1}{2}$ and $\bar{E} > E$ the following inequality holds $\Pi(\frac{1}{2},\bar{E}) < \Pi(\alpha,\bar{E})$.

\textsuperscript{31} The main addition to our results would be that risk-sharing costs would make financial incentives on performance measure $y$ more costly and therefore less useful.
\[
\text{Max } f((\alpha - \alpha^2)E^2) - c - \frac{1}{2}E^2 + kE - \gamma_2(\alpha^{\infty} - \alpha)^2 \\
\text{s.t. } E^o = \beta(1 - \alpha) + k \\
\alpha^o = \alpha^{\infty} - \frac{\beta E}{\lambda} \\
0 \leq \alpha^o \leq 1 \\
w + \beta y - c - \frac{1}{2}E^2 + kE - \gamma_2(\alpha^{\infty} - \alpha)^2 \geq w
\]

where the last constraint is the participation constraint and \( w \) is the agent’s reservation wage. Given that the reservation wage is irrelevant for the optimal choice of \( \alpha, E, \) and \( \beta, \) we ignore this constraint. As a result, the principal chooses \( \beta \) that maximizes the following objective function:

\[
\text{Max } f((\alpha^o - \alpha^o^2)E^{o^2}) - c - \frac{1}{2}E^{o^2} + kE^o - \gamma_2(\alpha^{\infty} - \alpha^o)^2
\]

or equivalently, the principal sets the marginal benefits of financial incentives equal to the marginal costs, given the optimal responses of the agent, that is:

\[
f_{\beta}(\alpha^o,E^o) = C_{\beta}(E^o) + L_{\beta}(\alpha^o)
\]

The maximization problem (P1) and equations (A7) and (A8) imply the following. Using financial incentives, i.e., \( \beta > 0, \) increases total effort and decreases the effort allocated to Task B. Financial incentives (\( \beta > 0 \)) are thus always more costly than fixed wages (\( \beta = 0 \)) because both the cost of effort and the cost of noncompliance increase. Financial incentives, however, can also lead to more benefits, i.e., a higher gross payoff. More specifically, because of the opposite effects of financial incentives on total effort and effort allocation to Task B, the impact of financial incentives on the gross payoff is nonmonotonic, where an increase in \( \beta \) first leads to an increase in the gross payoff (effort intensity effect dominates) and then to a decrease (effort distortion effect dominates). As a result, there might be a range where the benefits of using financial incentives outweigh the costs (and we thus have an interior solution).

Given our focus on congruent social incentives, the model has two important implications for the design of optimal financial incentives in the presence of congruent social incentives (i.e., \( \alpha^{\infty} = \frac{1}{2} \)):

1. There exists a gross payoff function \( f'(\cdot) \) and parameters \( \lambda' \) and \( k' \) for which it is optimal for the principal to design an incentive contract that provides financial incentives solely on performance measure \( y, \) i.e., \( \beta^o > 0. \)

2. The higher \( \lambda \) the greater the cost of noncompliance associated with effort distortions and thus the greater the range where the effort intensity effect of financial incentives dominates. Thus, \textit{ceteris paribus}, an increase in \( \lambda \) leads to an increase in \( \beta^o. \)

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