Wage Negotiation, Employee Effort, and Firm Profit under Output-Based versus Fixed-Wage Incentive Contracts*

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1. Introduction

In recent years, firms have increasingly involved employees in decision making (McCaffrey, Faerman, and Hart 1995; Osterman 1994, 2000). Such participative decision making can benefit firms in two ways (Becker and Green 1962; Lawler 1986; Locke and Schweiger 1979; Pope 1984; Zwick 2004). First, it can lead to better decisions by facilitating information exchange between the firm and employees (i.e., an informational effect). This effect is an economic effect that is a common element of both agency theory (Baiman and Evans 1983; Freeman and Lazear 1995; Penno 1984; Sivaramakrishnan 1994) and the broader participative management literature (Covaleski, Evans, Luft, and Shields 2003; Kren 1992; Lawler 1986). Second, allowing employees to participate in decision making can increase their satisfaction and morale, resulting in increased effort and firm profit (i.e., a psychological effect). This psychological effect plays no role in agency theory, which assumes full economic rationality on the part of both firms and employees. In contrast, this psychological effect is an important part of the broader management and accounting literature on participative management (Covaleski et al. 2003; Kearney and Hays 1994; Miller and Monge 1986).[1]

Our study focuses on the psychological effect of a particular participative management practice, *wage negotiation*. Employees' involvement in wage determination is an important form of participative management (Gomez-Mejia and Balkin 1992; Locke and Schweiger 1979) and employees' compensation is often negotiated (Holden 1994). We conduct an experiment that examines the role of reciprocity in the wage negotiation process with the ultimate goal of understanding the effect of the process on employee effort and firm profit.

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1. Covaleski et al. (2003, 37) describe this psychological effect as "establishing trust and procedural justice, which can stimulate employee effort in addition to the effort that can be monitored and enforced through incentive contracts". Miller and Monge (1986, 730–31) refer to this psychological effect as working through "affective mechanisms", explaining that participation enhances productivity "through intervening motivational processes: participation fulfills needs, fulfilled needs lead to satisfaction, satisfaction strengthens motivation, and increased motivation improves workers' productivity". Describing the human relations theory of participation, Ritchie and Miles (1970, 348) explain that adherents "believe simply in involvement for the sake of involvement, arguing that as long as subordinates feel they are participating and being consulted, their ego needs will be satisfied and they will be more cooperative".

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An experiment is well suited for isolating the psychological effects on employee effort and firm profit because we are able to design a setting with no information asymmetry. This ensures that our experimental results are due to the psychological effects we are interested in rather than informational effects. The psychological versus informational effects of negotiation are difficult to disentangle in field data because they typically occur simultaneously.

In addition to the potential positive effect on effort discussed in the participative management literature, allowing employees to negotiate their wage could sometimes also have offsetting negative effects. In our experiment, the firm offers a contract (output based or fixed wage), makes a wage offer, and decides whether to allow employees to negotiate the wage. If the firm chooses to allow negotiation, the employee who has accepted that firm's contract can make a counteroffer, and then the firm makes a new final wage offer, which the employee either accepts or rejects. We expand the participative management view by characterizing this participative negotiation process as a reciprocal process that can result in either positive or negative effects on employee effort and firm profit depending on how the process plays out. In particular, we predict and find that employees form an aspiration level when making a counteroffer and that whether this aspiration level is satisfied by the firm (i.e., whether the firm accepts the employee's counteroffer) affects employees' subsequent effort choices and thus firm profit. Specifically, acceptance of employees' counteroffers leads to a higher employee effort, while failing to match counteroffers leads to lower employee effort.

We also predict and find that firms' decisions to allow negotiation and to accept the employee's counteroffer are influenced by the power they have to induce employee effort. If the firm is able to write an output-based contract, it has more power to induce profit-maximizing effort and thus feels less need to allow negotiation or to accept an employee's counteroffer when allowing negotiation. In contrast, if the firm is unable to write an output-based contract and therefore must rely on a fixed-wage contract, the firm is more willing to allow negotiation and to accept an employee's counteroffer. Firms' lower level of accepting employees' counteroffers under the output-based contract results in more choices of low effort and a more negative effect on firm profit under the output-based contract than under the fixed-wage contract. As a result, there is no difference in employee effort and firm profit with negotiation versus without negotiation under the fixed-wage contract, whereas negotiation leads to lower employee effort and firm profit than no negotiation under the output-based contract. These findings reflect the fact that the negative effect on effort offsets the positive effect under the fixed-wage contract, while the negative effect dominates the positive effect under the output-based contract.

Our study contributes to the literature in two ways. First, we expand the participative management literature by providing evidence of both positive and negative reciprocity in the participation process. Specifically, we provide evidence that the participation process may cause employees to focus on the outcome they expect to achieve. If this aspiration level is subsequently satisfied by the firm, employees react positively. However, if this aspiration level is not satisfied by the firm, employees react negatively. Moreover, our results suggest that, because the reciprocal process plays out differently under different incentive contracts, the nature of the contract can influence whether the positive or negative effects on effort dominate.

Second, our results, along with the related findings of Fisher, Frederickson, and Peffer 2002 and Libby 1999 (discussed further later), suggest that firm management needs to carefully consider a wider range of potential costs and benefits of participation than those assumed in standard economic analysis or in the participative management literature. This is particularly important in managerial accounting settings in which participative decision making in the form of negotiation plays an important role. For example, negotiation is

often used to set compensation levels, budget targets, transfer prices, etc. In addition to identifying a previously undocumented potential cost of negotiation, our results suggest that the cost–benefit trade-off of engaging employees in negotiation is likely to depend on the contracting power that firms have over employees.

The remainder of the paper is organized as follows. The next section discusses the background literature, and the third section develops the hypotheses. The fourth section describes the experimental setting, design, and procedures. The fifth section reports our results, and the final section summarizes and discusses our findings.

2. Background

Contract type

Employee effort is generally not directly observable by the firm. To the extent that productive output is informative about employee effort, firms induce desired effort by offering incentive contracts that link employees' wage to output so that a higher wage can be earned only if output is high (Holmstrom 1979; Lambert 2001). However, if output is not measurable at a reasonable cost or not contractible, firms cannot link employees' wage to output but instead pay a fixed wage (Lazear 1986). Both of these types of contracts are widely observed in practice (MacLeod and Parent 1999). We examine these two types of contracts (output based versus fixed wage) in an experimental setting in which the link between effort and output is not affected by environmental uncertainty. Consequently, there is no confounding effect of individuals' risk preferences, and the agency theory predictions regarding firms' and employees' behavior under each contract (described in more detail later) are unambiguous.

Prior negotiation research

As noted earlier, our study examines the effects on employee effort and firm profit of the reciprocal interactions between firms and employees during negotiation. That is, we treat the interactions during the negotiation process as independent variables and examine the effect of these process variables on employees' postnegotiation effort choices and firm profit. In contrast, most prior negotiation studies in economics (see Hey 1991 and Roth 1995 for reviews), psychology (see Bazerman, Curhan, Moore, and Valley 2000 for a review), management (Conlon and Parks 1990; Parks and Conlon 1995), and auditing (Bame-Aldred and Kida 2007; Gibbins, Salterio, and Webb 2001; Gibbins, McCracken, and Salterio 2005; Hatfield, Agoglia, and Sanchez 2008; Sanchez, Agoglia, and Hatfield 2007; Trotman, Wright, and Wright 2005) have treated the process variables (e.g., impasse, the resolution of conflicts) or negotiators' tactics during negotiation (e.g., deception, trading off different issues) as the dependent variables of interest and have not examined the effects on postnegotiation variables such as effort or firm profit. However, a few field studies have examined the effect of negotiation on effort, firm profit, or other dependent variables related to effort and firm profit (e.g., Campling 1998; Katz and Keefe 1992; Morishima 1991; Walton, Cutcher-Gershenfeld, and McKersie 1994). A critical distinction between these field studies and our experiment is that they could not isolate the psychological effects of negotiation from the benefits associated with the exchange of information or the many other confounding factors present in the field.

Several experimental transfer pricing studies in accounting (Chalos and Haka 1990; DeJong, Forsythe, Kim, and Uecker 1989; Ghosh 1994, 2000; Greenberg, Greenberg, and Mahenthiran 1994) examined how negotiation between the managers of the buying and selling divisions affects the managers' attitude and divisional profit. In an experimental management study, Bottom et al. (2006) examined how contracts negotiated via free-form verbal communication influence employee effort, focusing on how effort is affected by employees'

perceptions of firms' benevolence as influenced by various factors inherent in the verbal communication process (e.g., negotiators' affect, the number and friendliness of words exchanged). But, as with the field studies identified earlier, all of these experimental studies examined settings with information asymmetry between negotiators and therefore could not distinguish between the psychological and informational effects of negotiation.[2]

In a series of experimental studies, Fisher, Frederickson, and Peffer (2000, 2002, 2006) examined negotiation in participative budgeting settings. Fisher et al. (2006) correctly note that most other participative budgeting experiments (see Brown, Evans, and Moser 2009 for a review) did not consider the effects of negotiation between superiors and subordinates.[3] However, as with the other negotiation studies described above, Fisher et al.'s (2000, 2006) experimental settings included information asymmetry (i.e., subordinates had private information about their productive capability). That is, these studies were not designed to separate psychological effects from informational effects.[4] Moreover, in these studies the compensation contract, and hence the superior's contractual power to induce subordinates' effort, was held constant. In contrast, our study examines how different levels of effort-inducing power associated with different contracts affect the negotiation process and subsequently employee effort and firm profit.

The study by Fisher et al. 2002 is perhaps most closely related to ours. They compared negotiators' tactics and the likelihood of reaching a negotiated agreement under information asymmetry versus information symmetry (Hypotheses 1–4) and also compared subordinates' attitude and performance under agreement versus disagreement (Hypotheses 5a–6).[5] The similarity to our study is that they find that disagreement between superiors and subordinates on a budget target (which is then set by the superior) leads to lower subordinate performance than when a negotiated agreement is reached. Although they attribute the reduced performance to factors different from those we examine and do not vary the type of incentive contract, their results are related to ours in suggesting that the consequences of negotiation can sometimes be negative.

3. Hypotheses development

Prior management studies suggest that participation in decision making can fulfill employees' higher-order needs, including self-expression, independence, value, and respect (Blake and Mouton 1994; Leana, Ahlbrandt, and Murrell 1992; Likert 1967). When these important needs are met, employees develop a perception of being valued or being recognized by the firm, which increases their satisfaction and strengthens their intrinsic motivation to work hard (Davis 1976; Kearney and Hays 1994; Miller and Monge 1986). Consistent with this view, field surveys show that corporate executives believe that allowing employees to participate in decision making boosts their morale

2. An exception is a study by Kachelmeier and Towry 2002, who used an experimental transfer pricing setting with information symmetry, but their research focus was on the effects of negotiation media (face to face versus electronic) and other-regarding concerns on expected and actual transfer prices.
3. Also, in most prior participative budgeting experiments, the subordinate had final authority to set the budget and the superior was often hypothetical. An exception is a recent study by Rankin, Schwartz, and Young 2008, who examined the extent of honest reporting in a setting in which the superior could either accept or reject a subordinate's budget request. Because subordinates could take no actions after the superior's decision to accept or reject the budget request, this study does not address the issue of how employees respond to rejection of their request or how such a response affects firm profit.
4. Consistent with this view, Fisher et al. (2000) consider the informational effect to be the primary driver of the predicted difference in slack and performance between negotiation and no negotiation, suggesting that, with no negotiation, superiors do not know subordinates' actual productive capabilities and therefore might set the budget above their capabilities, which leads to their low commitment to the budget.
5. Fisher et al. (2002) pooled data across information asymmetry and information symmetry when testing H5a–H6.

and productivity (Lawler, Mohrman, and Ledford 1995; Lawler, Mohrman, and Benson 2001). Regarding the more specific case of participation in wage determination, Milkovich and Newman (1999) explain that firms engage employees in the process to increase their perceived procedural fairness. Consequently, despite the fact that agency theory predicts that in our setting negotiation has no value for the firm, we expect that at least some firms will choose to negotiate with the expectation that employees will respond favorably. Moreover, as explained below, we expect that the decision to allow negotiation as well as the effect of this decision on employee effort and firm profit will vary depending on the nature of the employment contract firms are able to offer.

The effects on effort and firm profit of both the fixed-wage contract and output-based contract used in this study have been examined in prior studies (Fehr, Kirchsteiger, and Reidl 1993; Fehr, Kirchler, Weichbold, and Gachter 1998; Hannan, Kagel, and Moser 2002; Hannan 2005; Kuang and Moser 2009), but only in settings without negotiation. In the absence of negotiation, the typical result under both contracts is that reciprocity between the employee and the firm plays a critical role. Specifically, firms offer a gift of a wage above the market-clearing level, and employees reciprocate with a gift of higher effort. We adopt this view of the interactions between firms and employees as a reciprocal process.

Providing firms the option to allow wage negotiation under either the output-based or fixed-wage contract expands the reciprocal process identified in earlier studies. Specifically, the firm now has two ways to offer employees a gift. First, the firm can allow negotiation, which employees are expected to view more favorably than not allowing negotiation, and second, the firm can make a relatively high initial wage offer. We expect that, if the firm chooses to allow negotiation and makes a relatively high initial wage offer, the employee will reciprocate by making a reasonable counteroffer that is not too much higher than the initial wage offer (hereafter referred to as a low markup). On the other hand, if the firm's initial wage offer is low, we expect that negative reciprocity will cause the employee to make a counteroffer that is considerably higher than the initial offer (hereafter referred to as a high markup). The firm then needs to decide how to respond to the employee's counteroffer. We expect that firms are more likely to reciprocate by accepting low (i.e., reasonable) markup counteroffers than high (i.e., unreasonable) markup counteroffers (hereafter we describe accepting a counteroffer as ''matching'' the counteroffer). Finally, when employees make their effort choices, we expect them to reciprocate by providing higher effort when firms match their counteroffers than when they do not.

While the process outlined above is a parsimonious way of describing negotiation in terms of reciprocity, it is possible that the process also includes strategic elements. For example, firms that allow negotiation could be attempting to learn their employee's wage expectations and could offer lower initial wages than firms that do not allow negotiation, with the expectation that the lower initial wage may be raised later in the negotiation process. When deciding what would be a reasonable counteroffer, employees are likely to consider the initial wage offered by their firm and the other wage offers observed in the market. However, as we explain more fully later when we report our results, whether the negotiation process is entirely reciprocal or reflects a combination of reciprocal and strategic considerations is largely semantic and does not affect our predictions regarding the effect of negotiation on employee effort and firm profit or the interpretation of our results.

Although we expect the basic negotiation process described above to be similar for both the fixed-wage and output-based contracts, we also expect differences across the two contracts. As noted earlier, the output-based contract gives the firm power to induce employees to provide the desired effort level via an incentive compatible contract. We expect that this power will have two consequences. First, firms that can offer the output-based contract will allow negotiation less often than those that can only offer the

fixed-wage contract. Second, firms that can offer the output-based contract, but nevertheless choose to allow negotiation, will still try to use their power to keep wages low by matching employees' counteroffers less often than firms that can only offer the fixed-wage contract.

In summary, the negotiation process described above leads to Hypotheses 1 and 2 stated below. These hypotheses reflect important aspects of the underlying process that lead to Hypotheses 3 and 4, which are developed next and examine how the negotiation process affects employee effort and firm profit with negotiation versus without negotiation.

HYPOTHESIS 1. *Firms will allow employees to negotiate less often when they can offer the output-based contract than when they can only offer the fixed-wage contract.*

HYPOTHESIS 2. *When the firm allows wage negotiation, firms will match employees' counteroffers less often under the output-based contract than under the fixed-wage contract (after controlling for markup and counteroffer).*

In addition to the hypotheses stated above, we expect that the firm's decision to match or not match an employee's counteroffer will affect employees' subsequent effort choices. Simon (1955, 1959) suggests that individuals often simplify decisions by categorizing possible outcomes as dichotomous, for example, as "satisfactory" versus "unsatisfactory" or "win" versus "lose", depending on whether the outcome exceeds an aspiration level (Schneider 1992; Siegel 1957). In our setting, we expect that employees will form an aspiration level as they decide on the amount of their counteroffer and then base their subsequent effort choices on whether this aspiration level is satisfied by the firm. Employees are expected to perceive their aspiration level to be met if the firm's final wage is at least equal to their counteroffer (i.e., the counteroffer is matched), in which case they will react positively and increase their effort. On the other hand, employees are expected to perceive their aspiration level to be unmet if the firm's final wage is lower than their counteroffer (i.e., the counteroffer is not matched), in which case they will react negatively and reduce their effort.

Of course, employees who are given the opportunity to negotiate could strategically make counteroffers that are higher than their actual aspiration level, expecting that the firms will respond with a final offer that is somewhat lower than their counteroffer but still as high as their actual aspiration level. However, we believe this is unlikely in wage negotiation settings because, under the reciprocal process described earlier, the size of an employee's counteroffer depends on how the firm treated the employee previously. Specifically, employees know that the opportunity to make a counteroffer is only available because the firm allowed negotiation in the first place. Furthermore, if the firm not only allows negotiation, but then also offers a relatively high initial wage, we expect employees to reciprocate by making a reasonable counteroffer. Employees are likely to realize that, if they make an unreasonably high counteroffer, firms might react negatively and offer a lower final wage than they would have if the counteroffer had been reasonable. However, because we cannot predict for certain whether employees' counteroffers reflect their actual aspiration level or an amount somewhat above their actual aspiration level, we start with the assumption that counteroffers represent aspiration levels, but then also conduct tests to assess whether actual aspiration levels might be slightly lower. It is important to note that whether counteroffers reflect aspiration levels or slightly higher amounts is of no consequence regarding the main issues of interest in our study.

The reasoning described above leads to our third hypothesis:

HYPOTHESIS 3. *Under both the output-based and fixed-wage contracts, when the firm allows wage negotiation, employee effort will be higher when the firm matches the*

employee's counteroffer than when the firm does not (after controlling for final wage).

In combination, Hypotheses 2 and 3 suggest that negotiation will have a more negative effect on employee effort under the output-based contract than under the fixed-wage contract because firms match the employee's counteroffer less often under the output-based contract. From the firm's standpoint, a more important issue is whether such differences in effort across the two contracts translate into differences in firm profit. Because firm profit is a function of both employee effort and the final wage paid to the employee, the final wage paid needs to be taken into account when analyzing the effect of effort on firm profit. Because there is no clear basis on which to predict the pattern of final wage across the two contracts, it must be controlled for statistically. After controlling for final wage, the difference in effort arising from the difference in matching of counteroffers across the two contracts directly affects firm profit. This leads to the following hypothesis:

HYPOTHESIS 4. *To the extent that negotiation has a more negative effect on effort choices under the output-based contact than under the fixed-wage contract, negotiation will have a more negative effect on firm profit under the output-based contract than under the fixed-wage contract (after controlling for final wage).*

Note that Hypothesis 4 cannot be tested by simply comparing effort and firm profit with negotiation between the output-based versus fixed-wage contract because, in addition to the effects hypothesized in Hypothesis 4, both effort and firm profit are directly affected by the underlying economic characteristics of each contract. Specifically, the output-based contract allows the firm to induce employees to provide the profit-maximizing effort level, while the fixed-wage contract does not. Thus, standard economic reasoning predicts that both effort and profit will be higher under the output-based contract than under the fixed-wage contract. We explain how this fact is taken into account in our analysis when we report our results.

4. Method

Experimental setting and contracts

We adopt the experimental setting used in several prior studies (Hannan et al. 2002; Hannan 2005; Kuang and Moser 2009). Specifically, we use a single-period agency setting, in which a firm hires an employee to provide effort in production. The firm's profit is determined as:[6]

$$\textit{Firm profit} = (120 - w)e \quad (1).$$

where:

w = the employee's wage; $w \in \{20, 21, ..., 120\}$

e = the employee's effort; $e \in \{0.1, 0.2, ..., 1.0\}$

6. We adopted this profit function from prior work (Fehr, Gachter, and Kirchsteiger 1997; Fehr et al. 1998; Hannan et al. 2002; Hannan 2005; Kuang and Moser 2009) because we wanted to extend such work on reciprocity between firms and employees. Consistent with these earlier studies, we chose not to use the more conventional profit function (i.e., firm profit = $120e - w$) to avoid possible negative payoffs for the firm, which are not allowed under institutional review board rules and could induce loss aversion (Tversky and Kahneman 1991). Prior research has shown that reciprocity between firms and employees holds under both the more conventional profit function and the profit function used in our study (Fehr et al. 1997; Fehr et al. 1998).

The firm's profit function in (1) can be rewritten as:

$$\textit{Firm profit} = 120e - we \quad (2).$$

The first product in (2), $120e$, represents the output produced by the employee. The output is observable by both the firm and the employee. However, employee effort is not observable by the firm. As shown below, effort aversion is induced by the increasing cost associated with each higher level of effort.

The employee's net payoff is:

$$\textit{Employee's net payoff} = w - c(e)$$

where: $c(e)$ = the cost of effort to the employee; $c(e)$ is determined as follows:

e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
$c(e)$	0	1	2	4	6	8	10	12	15	18

Output-based contract

Although the firm cannot observe the employee's effort choice, it can perfectly infer the effort level by observing the output because the link between effort and output is not influenced by any external uncertainty. Therefore, assuming that output is contractible, agency theory specifies that the optimal contract is determined by solving the following maximization problem:

$$\underset{w,\,e}{\text{Maximize}}(120e - we)$$

$$\text{subject to: } w - c(e) \geq P_0$$
$$w - c(e) \geq w - c(e')$$

where:
P_0 = the employee's reservation net payoff; in this study P_0 is set at 20 e, $e' \in E$ and $e \neq e'$ (E = the employee's set of possible effort levels)

Solving this maximization problem yields the following output-based "forcing" contract: [7]

$$w = w_H = 38 \textit{ if output is } 120 \textit{ (i.e., employee chooses effort level } 1)$$
$$w = w_L = 15 \textit{ if output is not } 120 \textit{ (i.e., employee chooses any other effort level)} \quad (3).$$

Agency theory (Harris and Raviv 1978) predicts that, under the optimal contract in (3), a rational employee will always choose effort level 1, producing the first-best firm profit of 82 (i.e., $120 \times 1 - 38 \times 1 = 82$). However, prior research suggests that employees typically expect the firm to maintain a reciprocal relationship with them (Rousseau 1995). Because the optimal output-based contract in (3) offers the lowest wage (w_H) necessary to induce profit-maximizing effort, employees may view this contract as violating the reciprocity norm. Consistent with this view, Kuang and Moser (2009) find that, in a market where

7. The maximization problem is solved using Grossman and Hart's 1983 approach. The contract resulting from applying this approach offers a high wage (w_H) of 38 for output of 120 and a low wage (w_L) for any output other than 120. The low wage (w_L) was set to ensure that employees were always financially better off by choosing the theoretically optimal effort level of 1 and to avoid negative payoffs for employees who chose a suboptimal effort level. Given these constraints, we could have set w_L at any wage between 15 and 19. We chose 15 because this allowed firms to impose the highest penalty on employees who did not choose the optimal effort level of 1.

firms choose to offer either the optimal output-based contract or a theoretically suboptimal (but more reciprocal) fixed-wage contract, the optimal output-based contract often fails to generate the first-best firm profit because employees penalize firms that offer this contract by exerting low effort or even rejecting the contract. Moreover, they also find that a hybrid output-based contract that combines the effort-inducing feature (i.e., the employee can earn a higher wage only if the output is 120) and a reciprocal feature (i.e., the firm can offer a wage higher than the optimal wage of 38) is at least as effective in inducing profit-maximizing effort as the optimal output-based contract, while also significantly increasing total welfare. Therefore, in this study we use the hybrid contract used by Kuang and Moser 2009 as our output-based contract. Under this contract, the firm pays a high wage (w_H) set by the firm if output is 120 and a low wage (w_L) of 15 if output is not 120 as indicated below.

$$w = w_H, \textit{ which is set by the firm, if output is } 120 \textit{ (i.e., employee chooses effort level } 1)$$
$$w = w_L = 15 \textit{ if output is not } 120 \textit{ (i.e., employee chooses any other effort level)} \quad (4)$$

It is important to note that the agency theory predictions regarding firms' and employees' behavior under the output-based contract in (4) are identical to those for the standard optimal output-based contract described in (3). That is, under both (3) and (4), the firm will offer a wage of 38 and the employee will choose effort level 1. Despite these predictions, Kuang and Moser (2009) find that under (4), firms generally offer a wage higher than 38 (i.e., a gift) and employees reciprocate by offering the profit-maximizing effort level of 1 more often than they do under the standard optimal contract described in (3).

Fixed-wage contract

If we retain the setting described above for the output-based contract, but assume that output is not contractible as was done in a series of previous studies, the contract offered by the firm will be a fixed-wage contract (Fehr et al. 1993; Fehr et al. 1998; Hannan et al. 2002; Hannan 2005; Kuang and Moser 2009). We adopt this fixed-wage contract used in these prior studies for our experiment. Under this contract, the firm offers a wage within the specified range (20–120), and then the employee who accepts that wage offer chooses an effort level. Agency theory predicts that the employee will always choose the lowest effort possible (0.1) regardless of the amount of the wage offer. Anticipating this, the firm will always offer the lowest wage possible (20). However, as indicated earlier, prior research finds that, under this fixed-wage contract, firms and employees engage in a reciprocal process. Specifically, firms offer higher wages and employees provide higher effort than agency theory predicts, and effort levels are positively related to wage offers (Hannan et al. 2002; Hannan 2005).[8]

Experimental design and procedures

Design

Our experiment uses a 2×2 design, with two between-participant *manipulated* levels of contract condition (output-based and fixed-wage, as described above) and two *measured* levels of whether the firm allows negotiation (negotiation or no negotiation). In the output-based contract condition, the output-based contract is the only contract the firm

8. Theoretically, reciprocity between firms and employees can increase total welfare under the fixed-wage contract, but not under the output-based contract. However, we know from Kuang and Moser 2009 that, despite the theoretical prediction, reciprocity can, in fact, increase total welfare under the hybrid contract used as the output-based contract in our study because employees often do not provide the optimal effort level of 1 when offered the market-clearing wage of 38, and thus total welfare falls well below the theoretical optimal level. As a result, reciprocity can increase total welfare if firms can elicit more effort level 1 responses by offering higher wages or matching an employee's counteroffer. As reported later, we observe such reciprocity, but despite this, total welfare still does not reach the theoretically optimal level.

can offer. The firm chooses a wage offer (w_H) between 38 and 120, which is paid to the employee if output is 120 (i.e., if the employee chooses effort 1); otherwise a low wage (w_L) of 15 is paid. In the fixed-wage contract condition, the fixed-wage contract is the only contract the firm can offer. The firm chooses a wage offer between 20 and 120, which is paid to the employee regardless of output.[9]

Overview of negotiation process

For both the output-based and fixed-wage contract conditions, firms decide whether to allow wage negotiation at the same time they make their initial wage offer. If the firm decides not to allow negotiation, the initial wage offer is the final wage offer, and the employee who accepts the firm's contract chooses an effort level. If the firm decides to allow negotiation, the employee who accepts the firm's contract has an opportunity to make a counteroffer. If the employee makes a counteroffer, the firm makes a new final wage offer, which could or could not match the employee's counteroffer. The employee then either accepts the final wage offer and chooses an effort level or rejects the final wage offer, in which case the employee remains unemployed and the firm receives no payoff from production for the period.[10]

Participants and procedures

Participants were 80 MBA students, with an average of 4.9 years of full-time work experience. Eight experimental sessions were conducted (four for each of the two contract conditions). In each session, 10 participants were randomly assigned the role of firm or employee (five in each role) and retained this role throughout the session. Data from the four sessions for each contract condition were pooled because there were no significant differences across sessions. Thus, the final data set includes 20 firms and 20 employees in each of the two contract conditions.

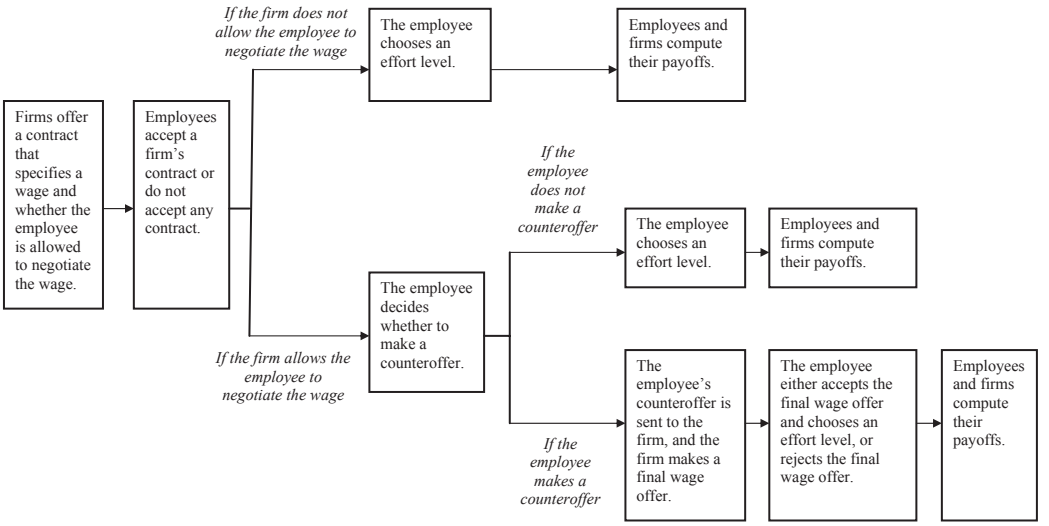
In each session, firms and employees interacted for 12 periods. To ensure anonymity, all participants were identified only by a participant number, and a new participant number was assigned to each participant at the beginning of each period. Firm and employee participants were seated in the same room, but were divided by a screen. The screen prevented firms and employees from seeing each other, but allowed all participants to see the experimenter and a whiteboard in the front of the room. Firm and employee participants were prohibited from communicating in any way during the experiment except as described in the procedures below.

At the beginning of each session, the experimental instructions were read aloud to all participants. Following an overview of the experimental setting and task, the specifics of the contract for that session (either output based or fixed wage) and the negotiation option were explained in detail. A spreadsheet showing both the employee's net payoff and firm

9. The minimum wage is set at 38 under the output-based contract and 20 under the fixed-wage contract to ensure that, from the agency theory perspective, the employee receives a minimum net payoff of 20 in either case. Specifically, under the output-based contract, a rational employee will choose effort level 1 and be paid a wage of 38, receiving a net payoff of 20 (i.e., 38 minus the cost of effort level 1 of 18). Under the fixed-wage contract, a rational employee will be paid a wage of 20 and choose effort level 0.1, receiving a net payoff of 20 (i.e., 20 minus the cost of effort level 0.1 of 0).

10. This last feature reflects settings in which the employee does not have superior alternative employment options immediately available. While this may result in some employees accepting contracts that are not as desirable as they might like (as is often the case in actual labor markets), this should not happen often in our setting because firms have strong incentives to offer contracts that are accepted in order to have production and receive the associated profits. More importantly, this setting works against our hypothesized negative effect on firm profit when firms do not match counteroffers because if employees rejected the final wage offer in favor of an alternative contract with another firm, this would have reduced profit even further for firms that did not match counteroffers than if the employee had accepted the contract and provided low effort.

Figure 1 Experimental timelines for both the fixed-wage and output-based contract conditions.



profit for every possible wage-effort combination under the contract used for that session was provided to all participants. All participants completed several exercises to ensure that they fully understood the setting and the contract before beginning the experiment.

Our labor market procedures are modeled after those used in a series of previous studies (Fehr et al. 1993; Fehr et al. 1998; Hannan et al. 2002; Hannan 2005; Kuang and Moser 2009), modified as necessary to allow the negotiation option. Timelines for both the fixed-wage and output-based contract conditions are shown in Figure 1. Experimental procedures for both contract conditions are identical except as indicated.

As shown in Figure 1, for both the fixed-wage and output-based contract conditions, firms first made two decisions: (1) the amount of their initial wage offer and (2) whether to allow employees to negotiate the wage. Firms wrote their wage offer and decision regarding negotiation on a communication form, which was collected by the experimenter. All contract offers, which indicated the amount of the initial wage and whether the employee was allowed to negotiate the wage, were then posted on a whiteboard in the front of the room visible to all participants. Next, employees took turns accepting an available contract following a sequence that was predetermined by randomly assigning participant numbers that were reassigned each period (i.e., employee #1 had the first opportunity, employee #2 had the second opportunity, etc.). When an employee's turn came, s/he could accept any one of the posted contracts that was still available, in which case the communication form from the firm offering that contract was given to the employee. Alternatively, the employee could choose not to accept any contract, in which case the employee remained unemployed and received no payoff for that period. Once a firm's contract was accepted, it was no longer available to any other employees.

If the firm did not allow wage negotiation (top path in Figure 1), the firm's wage offer was final. The employee who accepted that firm's contract chose an effort level and recorded it on the communication form and his/her personal record sheet. The communication form was sent back to the firm so that the firm could record the employee's effort level on the firm's personal record sheet. Finally, firms and employees used their personal record sheets to calculate their payoffs for that period.[11]

11. We allowed firm participants to learn the employee's effort choice only for purposes of calculating their profit. We retained the assumption of noncontractibility of effort by not allowing firms to condition their wage on effort.

If the firm allowed wage negotiation (bottom path of Figure 1), the firm's initial wage offer was not necessarily the final wage because the employee who accepted the firm's contract could make a counteroffer. If the employee did not make a counteroffer, the firm's initial wage offer became the final wage, the employee chose an effort level, and the firm and employee calculated their respective payoffs. If the employee made a counteroffer, s/he wrote it on the communication form, which was sent back to the firm. The firm then replaced the initial wage offer with a new final wage offer on the communication form, which was again sent back to the employee. The employee either accepted this final wage offer, in which case s/he chose an effort level, or rejected the final wage offer, in which case the employee remained unemployed and the firm received no payoff from production for the period. Employees who accepted a firm's contract recorded their effort level on the communication form and their personal record sheets. The communication forms were then sent back to the firms so that they could record the employee's effort level on their personal record sheets. Finally, firms and employees calculated their respective payoffs on their personal record sheets.

In all cases, the period ended when the experimenter collected the completed personal record sheets from all participants. The procedures described above were then repeated for each subsequent period of the experiment. After all periods were completed, participants completed a postexperiment questionnaire designed to collect data regarding firms' (employees') reactions to their interactions with employees (firms). At the end of the experiment, participants' cumulative earnings for all periods were converted from Lira, the experimental currency, to dollars at the rate of 50 Lira = \$1 and participants were paid in cash.

5. Results

Descriptive data

Panel A of Table 1 reports descriptive statistics for the cases in which firms allowed negotiation under the fixed-wage and output-based contracts. For each contract type, panel A reports the percentage of firms that allowed negotiation, the average initial wage offer, the average counteroffer,[12] the percentage of counteroffers that were matched by the firm, and the average final wage offer.[13] Panel B of Table 1 reports descriptive statistics for cases in which the firm allowed negotiation (*Negotiation*) versus cases in which the firm did not allow negotiation (*No Negotiation*) under the output-based and fixed-wage contracts. For each of the four conditions, panel B reports the average employee effort, the average final wage offer, the percentage of contract rejection, and the average firm profit.

Firm–employee negotiation process (tests of Hypotheses 1–2)

Test of Hypothesis 1

Hypothesis 1 predicts that firms will allow employees to negotiate less often when they can offer the output-based contract than when they can only offer the fixed-wage contract. As shown in panel A of Table 1, consistent with this hypothesis firms were less likely to allow negotiation under the output-based contract (38 percent of the time) than under the fixed-wage contract (52 percent of the time). An untabulated logistic regression of *Negotiation*

12. Occasionally an employee did not make a counteroffer when negotiation was allowed (6 percent of the time under the fixed-wage contract and 16 percent under the output-based contract). We exclude those observations from our hypothesis tests because of missing data on the counteroffer. Adding them back to analyses in which the counteroffer is not involved does not change the statistical inferences reported in the paper.

13. Average total earnings of participants, including an \$8.00 participation fee, were as follows: Output-based contract (firms \$18.52, employees \$16.67); fixed-wage contract (firms \$12.32, employees \$19.03).

TABLE 1
Descriptive statistics

Panel A: Firm allows negotiation under the fixed-wage and output-based contracts*

	Firm allows negotiation (fixed-wage contract)	Firm allows negotiation (output-based contract)
% of firms allowing negotiation†	52%	38%
Average initial wage‡	39	53
Average counteroffer§	71	76
% of counteroffer being matched#	34%	13%
Average final wage**	53	62

Panel B: Negotiation versus no negotiation under the fixed-wage and output-based contracts*

	Fixed-wage contract			Output-based contract		
	No negotiation (n = 116)	Negotiation (n = 117)	Economic prediction	No negotiation (n = 150)	Negotiation (n = 76)	Economic prediction
Average effort level††	0.30	0.30	0.10	0.83	0.76	1.0
Average final wage**	47	53	20	60	62	38
% of contract rejection‡‡	3%	6%	0%	5%	5%	0%
Average firm profit§§	19	17	10	47	41	82

(The table is continued on the next page.)

TABLE 1 (Continued)

Notes:

* Occasionally employees did not make a counteroffer when allowed to negotiate (6 percent of the time under the fixed-wage contract and 16 percent of the time under the output-based contract). We exclude these observations from this table (except in calculating the "% of firms allowing negotiation" in Panel A) and hypothesis tests because of missing data on the counteroffer. Adding them back to analyses that do not involve the counteroffer would not change the statistical inferences reported in the paper.

† % of firms allowing negotiation = (the number of firms that allowed negotiation)/(the total number of firms).

‡ Average initial wage = the mean of firms' initial wage offers.

§ Average counteroffer = the mean of employees' counteroffers.

% of counteroffers being matched = (the number of counteroffers that led to a final wage higher than or equal to the counteroffer)/(the total number of counteroffers).

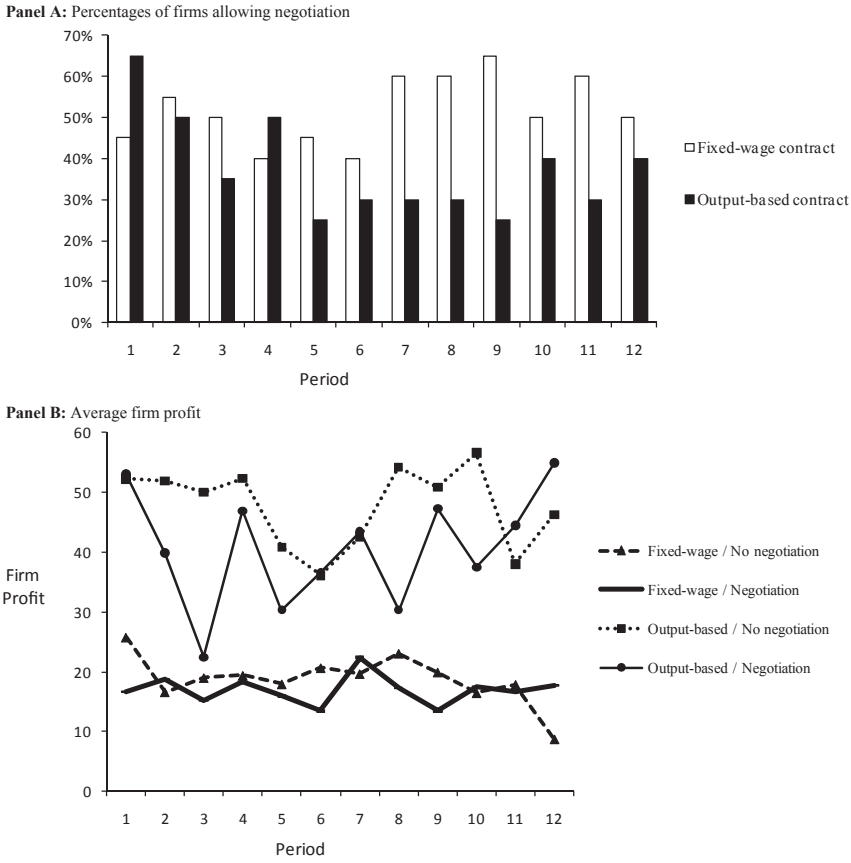
** Average final wage = the mean of firms' final wage offers.

†† Average effort level = the mean of employees' effort levels under accepted contracts. There was no effort choice for rejected contracts (the number of rejected contracts is 3 for No negotiation and 7 for Negotiation under the fixed-wage contract, and 8 for No negotiation and 4 for Negotiation under the output-based contract).

‡‡ % of contract rejection = (the number of contracts that were rejected by the employee)/(the total number of contracts). In the experiment, all rejections of contracts without the negotiation option occurred when the employee had the opportunity to choose one of the available contracts publicly posted. All rejections of contracts with the negotiation option occurred after the firm made a final wage offer (i.e., the contract and the associated initial wage offer were first "accepted," the employee made a counteroffer, the firm made a final wage offer, and then the employee rejected the final wage offer).

§§ Average firm profit = the mean of firm profit for all contracts, including firm profit of zero when a contract was rejected.

Figure 2 Percentages of firms allowing negotiation and average firm profit by period under the fixed-wage and output-based contracts.



(a dummy variable coded as one if the firm allowed negotiation and zero otherwise) on *Contract Type* (a dummy variable coded as one if the contract was an output-based contract and zero otherwise) indicates that this difference is significant ($z = -1.79$, $p = 0.037$, one-tailed).[14] Moreover, as shown in panel A of Figure 2, firms were consistently less likely to allow negotiation under the output-based contract than under the fixed-wage contract for each of the last eight periods. The fact that fewer firms allowed negotiation under the output-based contract is consistent with our expectation that firms that are able to write an output-based contract feel less need to accommodate employees than firms that are only able to write a fixed-wage contract.

It is interesting that firms chose to negotiate as often as they did under both contacts. As noted earlier, agency theory predicts that negotiation will have no value for the firm because there is no information asymmetry. However, a substantial literature in accounting and management suggests that employees respond positively to participating in decisions and that managers expect such a positive response. Consistent with this view, when firm participants were asked in a postexperiment questionnaire whether they believed that employees preferred a negotiable contract or a non-negotiable contract, or were indifferent

14. All analyses reported in this study that involve within-subject observations use the Huber-White method to estimate robust standard errors after adjusting for nonindependence caused by repeated measurement (Huber 1967; White 1982). All reported *p*-values are two-tailed unless otherwise specified.

between the two, large majorities of firms under both contracts indicated that employees preferred a negotiable contract (90 percent for fixed-wage contract and 85 percent for output-based contract). Moreover, consistent with firms' expectations regarding employees' preferences, when employees were asked about their preferences, a significant majority indicated that they preferred a negotiable contract (75 percent for the fixed-wage contract and 70 percent for the output-based contract).

Other responses to questions in the postexperiment questionnaire also support the interpretation that firms offered to negotiate because they believed employees would respond positively. Employees rated on an 11-point Likert scale with endpoints of 1 (lowest) and 11 (highest): (1) the fairness of negotiation versus no negotiation and (2) the extent to which they were satisfied with the way their wages were determined under negotiation versus no negotiation. Employees perceived it to be fairer under both contracts (paired t-tests: $p \leq 0.02$) when negotiation was allowed (fixed-wage contract = 8.1; output-based contract = 6.7) than when it was not allowed (5.7 and 5.1, respectively), and felt more satisfied with the way their wages were determined (paired t-tests: $p < 0.01$) with negotiation (fixed-wage contract = 7.9; output-based contract = 6.3) than with no negotiation (4.2 and 4.0, respectively). This latter result is particularly interesting because the results we report later show that the final wage did not differ with negotiation versus without negotiation, and thus it is the negotiation process itself rather than a difference in the final wage that drives employees' preference for negotiation. Overall, the postexperiment questionnaire results suggest that employees strongly preferred negotiation versus no negotiation and that firms correctly anticipated employees' preferences.[15]

Test of Hypothesis 2

Hypothesis 2 predicts that firms will match employees' counteroffers less often under the output-based contract than under the fixed-wage contract. To test Hypothesis 2, we ran a logistic regression with *Matching* (a dummy variable coded as one if the final wage offer was higher than or equal to the counteroffer and zero otherwise) as the dependent variable and *Contract Type*, *Counteroffer* (the employee's counteroffer), and *Markup* (the employee's counteroffer minus the firms initial wage offer) as independent variables. *Contract Type* is the primary independent variable of interest, and *Counteroffer* and *Markup* are included as control variables.

As reported in panel A of Table 2, results indicate that *Contract Type* significantly ($p < 0.01$) affects *Matching*. Consistent with Hypothesis 2, firms matched counteroffers more often under the fixed-wage contract (34 percent of the time; see panel A of Table 1) than under the output-based contract (13 percent of the time). *Counteroffer* does not significantly affect *Matching* ($p = 0.67$), while *Markup* is significantly negatively associated with *Matching* ($p = 0.05$), suggesting that it is not the size of the counteroffer per se that firms consider when deciding whether to match a counteroffer, but rather how reasonable and reciprocal the counteroffer is given the amount of the initial wage offer. Taken together, these results are consistent with our expectations that, after controlling for the

15. To confirm that employees' choices of contracts were consistent with their preferences as measured in the postexperiment questionnaire, we ran an ordered logistic regression, with the order in which a contract was accepted by an employee (coded as 1, …, 5 if the contract was accepted first, …, fifth) as the dependent measure and *Negotiation*, *Initial Wage* (the firm's initial wage offer), *Contract Type*, *Negotiation* interacted with *Contract Type*, and *Initial Wage* interacted with *Contract Type* as independent variables. *Negotiation* is significant ($z = -5.38$, $p < 0.01$) and the interaction between *Negotiation* and *Contract Type* is not significant ($z = 0.13$, $p = 0.90$), indicating that negotiable contracts were preferred by employees and consequently chosen first in both contract conditions. Of the other control variables, only *Initial Wage* is significant ($z = -4.99$, $p < 0.01$), indicating that employees chose contracts offering higher initial wages before those offering lower initial wages under both contracts.

TABLE 2
Main tests of Hypotheses 2–3

Panel A: Hypothesis 2: Logistic regression (dependent variable: *Matching**)

Independent variables	Coefficient	Robust SE	*z*-statistic	*p*-value, two-tailed
Intercept	−0.07	0.99	−0.07	0.94
Contract Type†	−1.58	0.54	−2.94	< 0.01
Counteroffer‡	0.01	0.02	0.43	0.67
Markup§	−0.04	0.02	−1.92	0.05

Panel B: Hypothesis 3

Tobit regression for the fixed-wage contract (dependent variable: *Effort*#)

Independent variables	Coefficient	Robust SE	*z*-statistic	*p*-value, two-tailed
Intercept	0.12	0.25	0.49	0.63
*Matching**	0.49	0.18	2.67	0.01
Final Wage **	−0.01	0.01	−0.65	0.51

Ordered logistic regression for the output-based contract (dependent variable: *Effort*††)

Independent variables	Coefficient	Robust SE	*z*-statistic	*p*-value, two-tailed
*Matching**	34.83	0.73	47.59	< 0.01
*Final Wage***	0.17	0.05	3.73	< 0.01

Notes:

* *Matching* = a dummy variable coded as one if the firm's final wage offer was higher than or equal to the employee's counteroffer and zero otherwise.

† *Contract Type* = a dummy variable coded as one if the contract was output based and zero otherwise.

‡ *Counteroffer* = the employee's counteroffer.

§ *Markup* = the employee's counteroffer – the firm's initial wage offer.

Effort = the employee's effort level.

** *Final Wage* = the firm's final wage offer.

†† *Effort* = a dummy variable coded as one if the employee's effort level was 1.0 and zero otherwise.

fact that firms are more likely to match counteroffers with lower markups, firms offering the output-based contract have more power to induce the desired effort level and therefore are less likely to match employees' counteroffers. Lacking such power, firms offering the fixed-wage contract are more willing to match employees' counteroffers in the hopes of receiving reciprocal effort.

Effects of negotiation on effort and firm profit (tests of Hypotheses 3–4)

Test of Hypothesis 3

Hypothesis 3 predicts that employee effort will be higher when the firm matches the employee's counteroffer than when the firm does not. Because of the nature of the output-based contract, employees' effort choices under this contract were essentially dichotomous.

That is, employees almost always chose either level 1 (i.e., the profit-maximizing effort level) or level 0.1 (i.e., the effort level with which employees can penalize the firm to the greatest extent at the lowest cost to themselves). In contrast, employees' effort choices under the fixed-wage contract were continuous across the range of allowable effort levels (0.1 to 1.0). Therefore, we are not able to combine these two effort variables across the two contracts to test Hypothesis 3, but rather we need to conduct separate analyses for each contract.

For the output-based contract, we ran an ordered logistic regression with a dummy variable *Effort* (coded as one if the employee chose effort level 1 and zero otherwise) as the dependent variable and *Matching* and *Final Wage* (the firm's final wage offer) as independent variables. For the fixed-wage contract, we ran a Tobit regression with *Effort* (the employee's effort level) as the dependent variable, and *Matching* and *Final Wage* as independent variables.[16] In both analyses, the primary independent variable of interest is *Matching*, while *Final Wage* is included as a control variable. As reported in panel B of Table 2, the results of these regressions indicate that both *Effort* measures are significantly positively related to *Matching* ($p \leq 0.01$). That is, consistent with Hypothesis 3, employees reciprocated with higher effort when their counteroffers were matched than when they were not.[17]

We also examine whether, consistent with expectations regarding the effect of aspiration level, it was matching of counteroffers per se that caused the employee to provide higher effort or whether simply raising the final offer above the initial offer and closer to the employee's counteroffer also led to higher effort. For cases where counteroffers were not matched, most firms nevertheless offered a final wage above their initial wage offer (86 percent of the time under the fixed-wage contract and 91 percent under the output-based contract). To test whether final wage offers that were close to, but not equal to, the counteroffer also increased effort, we repeat the tests of Hypothesis 3 including a new variable, *Closeness* (the final wage divided by the counteroffer), as an independent variable in the Tobit regression (for the fixed-wage contract) and ordered logistic regression (for the output-based contract). Results (untabulated) indicate that this *Closeness* measure is not significantly associated with employee effort ($p \geq 0.57$) under either contract, while *Matching* remains significantly positively associated with employees effort ($p < 0.01$). These results provide evidence that firms were not able to elicit greater employee effort by simply moving their final wage offer closer to the employee's counteroffer, but rather they actually needed to match the counteroffer in order to receive a positive (and avoid a negative) effort response. This suggests that employees' counteroffers represented their actual aspiration levels as opposed to strategic requests that exceeded the amount they actually expected to receive.[18]

Test of Hypothesis 4

The results reported above indicate that firms that allow negotiation elicit more negative effort responses under the output-based contract than under the fixed-wage contract

16. The Tobit model is used to control for the fact that the dependent variable *Effort* is a censored value.
17. When the firm does not allow negotiation, our setting is similar to that used in prior gift-exchange studies. Consistent with the findings of such studies, when firms in our study do not allow negotiation, employees' effort is significantly ($p < 0.01$) positively related to the firms' final wage offers under both contracts.
18. As further evidence that employees' counteroffers were a good measure of their actual aspiration levels, we find that most counteroffers were reasonable in that they fell within the range of initial offers available in the market for that period (91 percent under the output-based contract and 85 percent under the fixed-wage contract). Moreover, controlling for contract type, a logistic regression shows that counteroffers that fell within the reasonable range were more likely ($z = 2.26$, $p < 0.03$) to be matched than those above the range.

because they match the employee's counteroffer less often under the output-based contract. Hypothesis 4 examines whether firms' different matching behavior across the two contracts translates into different firm profits across the two contracts.

As noted earlier, Hypothesis 4 cannot be tested by simply comparing effort and firm profit under negotiation across the two contracts because: (1) firm profit is jointly determined by effort and final wage and (2) the economic effect of contract type confounds the effect on firm profit of differences in effort due to differences in matching of counteroffers across the two contracts. Regarding the latter issue, the economic effect of contract type and the effect of differential matching behavior across contracts work in opposite directions. Specifically, the difference in matching of counteroffers results in higher firm profit under the fixed-wage contract and the economic effect results in higher firm profit under the output-based contract. To overcome this problem and also take into account the effect of final wage, we first examine how final wage and effort compare with negotiation versus without negotiation under each contract. We then check whether firm profit, after controlling for final wage, exhibits the same pattern as effort with negotiation versus without negotiation.

We compare *Final Wage* with negotiation versus without negotiation using a regression with *Final Wage* as the dependent variable and *Negotiation*, *Contract Type*, and the interaction of *Negotiation* and *Contract Type* as independent variables. As reported in panel A of Table 3, results indicate that only *Contract Type* is significant ($p < 0.01$), reflecting that fact that *Final Wage* is higher under the output-based contract than under the fixed-wage contract. Importantly, the firm's choice to allow versus not allow negotiation has no impact on the final wage the firm pays the employee under either the output-based or fixed-wage contract.

We next conduct a similar analysis for effort. As explained earlier, because employees' effort choices were continuous under the fixed-wage contract but dichotomous under the output-based contract, we need to conduct separate analyses for each contract. Consequently, we ran a Tobit regression for the fixed-wage contract and an ordered logistic regression for the output-based contract, with *Effort* as the dependent variable and *Negotiation* and *Final Wage* as the independent variables. As reported in panel B of Table 3, results indicate that, for the fixed-wage contract, there is no difference ($p = 0.91$) in effort with negotiation (0.30; see panel B of Table 1) versus without negotiation (0.30). In contrast, for the output-based contract, effort is significantly lower ($p = 0.03$) with negotiation (0.76; see panel B of Table 1) than without negotiation (0.83).

Given the results reported above for final wage and effort, we expect firm profit to be lower with negotiation than without negotiation for the output-based contract but not for the fixed-wage contract. That is, because firm profit depends on both final wage and effort, but final wage does not differ with negotiation versus without negotiation under either contract, we expect firm profit to follow the same pattern as effort. This expectation represents a specific ordinal interaction effect, and thus the appropriate statistical test is a contrast analysis (Hays 1994; Keppel 1991; Kirk 1982).[19] Therefore, we estimate a contrast model to examine the predicted interaction effect of *Contract Type* and *Negotiation* on firm profit, controlling for *Final Wage*. As reported

19. Rosenthal and Rosnow (1985) and Rosnow and Rosenthal (1995, 1996) explain that contrast analysis, rather than omnibus *F*-tests, should be used to test a priori specified ordinal interactions because it provides higher statistical power without increasing the likelihood of Type I error. For the specific pattern we predict (output-based contract/no negotiation > output-based contract/negotiation > fixed-wage contract/no negotiation = fixed-wage contract/negotiation), Rosnow and Rosenthal (1995) recommend a contrast model with weights of +3, +1, −2, and −2, respectively, which we adopt for our analysis.

TABLE 3
Main tests of Hypothesis 4

Panel A: Ordinary least squares regression (dependent variable: *Final Wage**)

Independent variables	Coefficient	Robust SE	*t*-statistic	*p*-value, two-tailed
Intercept	46.93	3.85	12.18	< 0.01
Negotiation†	5.97	4.31	1.39	0.17
Contract Type‡	12.72	4.03	3.15	< 0.01
Negotiation × *Contract Type*	−3.72	4.71	−0.79	0.43

Panel B: Employee effort

Tobit regression for the fixed-wage contract (dependent variable: *Effort*§)

Independent variables	Coefficient	Robust SE	*z*-statistic	*p*-value, two-tailed
Intercept	−0.34	0.25	−1.37	0.17
Negotiation†	−0.01	0.08	−0.11	0.91
*Final Wage**	0.01	0.01	1.85	0.06

Ordered logistic regression for the output-based contract (dependent variable: *Effort*#)

Independent variables	Coefficient	Robust SE	*z*-statistic	*p*-value, two-tailed
Negotiation†	−0.83	0.38	−2.16	0.03
*Final Wage**	0.14	0.03	4.84	< 0.01

Panel C: Contrast analysis (dependent variable: *Firm Profit*)

Contrast model	*t*-statistic	*p*-value, two-tailed
No negotiation/output-based > Negotiation/output-based > No negotiation/fixed-wage = Negotiation/fixed-wage**	7.48	< 0.01
*Final Wage**	3.25	< 0.01

Notes:

* *Final Wage* = the firm's final wage offer.

† *Negotiation* = a dummy variable coded as one if the firm allowed negotiation and zero otherwise.

‡ *Contract Type* = a dummy variable coded as one if the contract was output based and zero otherwise.

§ *Effort* = the employee's effort level.

Effort = a dummy variable coded as one if the employee's effort level was 1.0 and zero otherwise.

** Reported results are for a contrast model with weights of +3, +1, −2, −2 as recommended by Rosnow and Rosenthal 1995. Statistical inferences are unchanged ($t = 7.58$, $p < 0.01$) when the weights of +5, +1, −3, −3 are used as recommended by Levin and Neumann 1999.

in panel C of Table 3, results indicate that, consistent with Hypothesis 4, the interaction is significant ($p < 0.01$), reflecting the fact that, as expected, firm profit was significantly lower ($t = 3.51$, $p < 0.01$) with negotiation (41; see panel B of Table 1) than without negotiation (47) under the output-based contract, but not different ($t = 1.60$, $p = 0.13$) with negotiation (17) versus without negotiation (19) under the fixed-wage contract.[20] Further, as shown in panel B of Figure 2, there is no well-defined trend in firm profit across the 12 periods of the experiment. That is, the differences in firm profit are not due to patterns in only earlier or later periods, but are relatively persistent across periods. Overall, these results are consistent with Hypothesis 4, which predicts that more negative effort responses under the output-based contract than under the fixed-wage contract will result in a more negative effect on firm profit under the output-based contract than under the fixed-wage contract after controlling for final wage.

Interestingly, as depicted in panel A of Figure 2, there is modest evidence that firms in the output-based contract condition allowed negotiation less often as they experienced its negative effect on firm profit. An untabulated logistic regression of the dummy variable *Negotiation* on *Period* (1–12) shows that the likelihood of allowing negotiation marginally significantly decreases ($z = -1.71$, $p < 0.09$) over the 12 periods. The same analysis for the fixed-wage contract shows no such effect ($z = 0.80$, $p = 0.42$).[21] These results suggest that at least some firms in the output-based contract condition learned that, while allowing negotiation can have positive effects, it can also have negative effects, and when the negative consequences dominated the positive consequences, they allowed negotiation less often.

Positive and negative effects of negotiation

We have interpreted our results as showing that whether the overall effect of negotiation is positive or negative depends on the extent to which the interactions between firms and employees result in positive reciprocity (when an employee's counteroffer is matched) or negative reciprocity (when an employee's counteroffer is not matched). The data presented in Table 4 provide direct support for this interpretation: After controlling for final wage, both effort and firm profit increased ($p \leq 0.03$) when counteroffers were matched relative to no negotiation (demonstrating a positive effect of negotiation), but decreased ($p < 0.02$) when counteroffers were not matched relative to no negotiation (demonstrating a negative effect of negotiation). Moreover, we have suggested that the positive and negative effects were offsetting under the fixed-wage contract, but that the negative effects dominated under the output-based contract. Consistent with this interpretation, the percentage of unmatched counteroffers under the output-based contract (66/76 = 87 percent) exceeded ($p < 0.01$) that under the fixed-wage contract (77/117 = 66 percent).

Nature of the interaction between firms and employees

As noted earlier, some of the firm–employee interactions in our experiment may include a strategic component. For example, under both the fixed-wage and output-based contracts, firms allowing negotiation offered lower initial wages ($p \leq 0.04$) than those not allowing negotiation, expecting that the wage might be raised during the negotiation process. As reported earlier, firms did increase their wage offers later in response to employees' counteroffers, but their final wage offers were not different from those of firms not allowing

20. Our statistical inferences are unchanged when we repeat the contrast analysis using alternative weights (+5, +1, −3, −3) suggested by Levin and Neumann 1999.

21. Relatedly, the percentage of firms that matched counteroffers significantly increased ($t = 2.26$, $p = 0.05$) over the 12 periods under the fixed-wage contract, but not under the output-based contract ($t = 0.75$, $p = 0.47$).

TABLE 4
Average employee effort and firm profit for matched/unmatched counteroffers and no negotiation

Panel A: Employee effort

	Fixed-wage contract	Output-based contract
Matched counteroffers*	0.46 (n = 40)	1.00 (n = 10)
No negotiation†	0.30 (n = 116)	0.83 (n = 150)
Unmatched counteroffers‡	0.22 (n = 77)	0.72 (n = 66)

Panel B: Firm profit

	Fixed-wage contract	Output-based contract
Matched counteroffers*	25 (n = 40)	53 (n = 10)
No negotiation†	19 (n = 116)	47 (n = 150)
Unmatched counteroffers‡	13 (n = 77)	39 (n = 66)

Notes:

* Matched counteroffers = when the firm allowed negotiation and set a final wage that was higher than or equal to the employee's counteroffer.

† No negotiation = when the firm did not allow negotiation.

‡ Unmatched counteroffers = when the firm allowed negotiation and set a final wage that was lower than the employee's counteroffer.

negotiation. In our view, whether such firm–employee interactions are described as reciprocal or strategic is largely a semantic issue because reciprocal and strategic actions are not independent. In fact, the negotiation process might best be described as one of strategic reciprocity. That is, when deciding on their own actions, both firms and employees take into account their expectations about others' responses (the strategic component), recognizing that such responses are likely to be driven by reciprocity rather than purely rational economic considerations (the reciprocity component).

In our experiment, if firms and employees expected the other party to behave in a purely rational economic manner, there would be no benefit to either party of engaging in negotiation. Thus, the mere fact that firms choose to allow negotiation suggests that they expected some type of positive effect. So in this sense, firms' choices to engage in negotiation are strategic, as are the responses of employees when making their counteroffers and the responses of firms to employees' counteroffers and employees' effort choices in response to firms' final wage offers. However, as discussed earlier, all such responses during the negotiation process are also consistent with reciprocal behavior (i.e., firms and employees who feel they were treated well or poorly by the other party respond in kind). The important point is that whether such firm–employee interactions are described as strategic, reciprocal, or some combination of the two is of no consequence for how we interpret our findings.

6. Discussion and conclusion

In this paper, we examine how wage negotiation affects employee effort and firm profit under an output-based versus a fixed-wage incentive contract. With no information asymmetry between firms and employees in our setting, we are able to isolate the psychological effects of negotiation. We find that, while employee effort and firm profit are lower with negotiation than without negotiation under the output-based contract, they do not differ

significantly with versus without negotiation under the fixed-wage contract. These findings are consistent with our predictions that differences in effort and firm profit across the two contracts result from the reciprocal interactions between firms and employees during negotiation.

Our findings expand the standard economic view that, in the absence of informational benefit, negotiation has no effect on employee effort or firm profit and the participative management view that participation motivates employees to work harder and, thus, improves firm profit. Practitioners and researchers often suggest that firms should increase employees' involvement in wage determination (Gomez-Mejia, Balkin, and Cardy 2001; Masternak and Ross 1992). However, our study shows that, to the extent that employees form an aspiration level when participating in wage determination, there can be both positive and negative effects of negotiation. Moreover, the magnitude of the positive or negative effects appears to depend on the contractual relationship between the firm and employee. Specifically, while the ability to contract on output gives the firm more power to induce employee effort, it also appears to dampen the firm's willingness to match the employee's aspiration level, which can result in negative effects on effort and firm profit.

A possible related reason for the negative effect of unmet aspiration levels is that employees reacted negatively because they felt their role in wage determination was only "pseudo-participation". That is, perhaps employees felt that their inputs were not considered even though they were involved in the decision-making process (Libby 1999; Pasewark and Welker 1990; Pateman 1970). However, our results do not appear to be driven by such feelings because employees' postexperiment questionnaire responses indicate that they preferred being allowed to negotiate and felt that negotiation was fairer and more satisfying than no negotiation. Moreover, even in cases in which the firm did not match an employee's counteroffer, the firm nevertheless increased the final wage offer in response to the counteroffer. That is, after controlling for initial wage offers, final wage offers are positively related to employees' counteroffers ($t = 1.99$, $p = 0.05$). Consequently, employees were aware that firms responded to their counteroffers even though they may have felt that the response was insufficient to satisfy their aspiration level.

We expect that there are negotiation settings other than wage determination in which different factors influence whether the positive or negative effects of negotiation (or of other participative management practices) dominate. One such case is reported by Fisher et al. 2002, who show that the effects of negotiation of budget targets on employee performance depend on whether the negotiation ends in agreement or impasse (in which case the superior sets the budget target). Specifically, they find that the budget target imposed by the superior in the case of negotiation impasse weakens the subordinate's commitment to the target and, thereby, lowers the subordinate's performance. This is similar to our finding that the negative effects dominate the positive effects under the output-based contract when employees' aspiration wage level is not met. Results such as these suggest that managers must carefully consider a wide range of potential costs and benefits of participation when deciding whether to encourage employee participation. Given that negotiation is a form of participative management that plays an important role in many accounting and auditing tasks (such as budgeting, transfer pricing, resource allocation decisions, auditor–client disputes, etc.), further research designed to provide a deeper understanding of the costs and benefits of negotiation and the effects on subsequent outcomes appears to be warranted.

Several limitations of this study could be addressed in future research. In our experiment, employees could only make one counteroffer before the firm sets a final wage. However, in practice negotiation may result in multiple counteroffers, and future research could examine whether employees' aspiration level would change as a consequence. Our setting captures an initial negotiation between a firm and employee, but some actual wage negotiations take place after the employee is already employed. We designed our study to preclude

reputation effects from previous or subsequent interactions between the firm and employee in order to rule out the economic effects of reputation. Now that a baseline has been established for the psychological effects in the absence of reputation effects, future research could investigate the potential incremental effects of reputational concerns. Finally, to isolate the psychological effect of negotiation, we designed a setting in which employees had identical productive capacity. In practice, employees often have different productive capacity (which is usually the employee's private information) and firms may pay a higher wage to attract more productive employees. It may be useful to explore whether employees' aspiration levels or the willingness of firms to match counteroffers change in such settings.

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