Reciprocity and the Effectiveness of Optimal Agency Contracts

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Abstract

Optimal agency contracts pay the lowest wage necessary to induce the effort necessary to maximize firm profit. Employees could view such contracts as violating the reciprocity norm because they offer a low wage in exchange for expected high effort. Consequently, the profit-maximizing effectiveness of optimal contracts could be impaired if employees punish firms offering the optimal contract by reducing their effort or rejecting the contracts in favor of more reciprocal contracts. We conduct three experiments using experimental labor markets to examine 1) how employees respond to being offered an optimal agency contract versus a theoretically suboptimal reciprocity-based contract when each contract is the only contract available in the market, 2) how employees respond to these two contracts in a market where firms choose which one to offer, 3) whether firms’ contract offers depend on employees’ reactions to those contracts, and 4) how employees and firms react to a contract that incorporates important features of both the theoretically optimal contract and the reciprocity-based contract. We find that the theoretically optimal contract is less effective than standard economic analysis predicts, and that a theoretically suboptimal reciprocity-based contract can be as effective. We also find that a new hybrid contract that incorporates the “forcing” feature of the optimal contract and the “reciprocity” feature of the sub-optimal contract can be more effective than either of these contracts alone. Overall, these results suggest that incorporating preferences for reciprocity into theoretical models can yield employment contracts and control systems that are more descriptive of current practice and potentially more useful as guides to practice.
I. Introduction

Agency theory is one of the most important theoretical paradigms in management accounting research (Indjejikian 1999; Lambert 2001). The main focus of agency research is on deriving optimal incentive contracts in various control environments (Baiman 1982). The goal of such contracts is to maximize firm profit, taking into account employees’ rationality and incentive compatibility constraints. Optimal contracts achieve this goal by offering employees the lowest wage necessary to induce the effort that maximizes firm profits.

However, in addition to the financial incentives in employment contracts, prior experimental research in accounting (Hannan 2005) and economics (Fehr, Kirchsteiger, and Reidl 1993; Fehr et al. 1998; Hannan, Kagel, and Moser 2002) has documented a reciprocity norm between firms and employees. Such reciprocity between firms and employees has been labeled “gift exchange” because, inconsistent with the predictions of conventional economic analysis, firms give employees a gift of a wage above the market-clearing level, and employees reciprocate with a gift of effort above the enforceable level (Akerlof 1982). This research has also shown that, on average, this type of reciprocity yields higher firm profit than if, as economic theory prescribes, firms pay only the market-clearing wage and employees provide only the enforceable effort level.

Preferences for reciprocity of the type documented in the gift-exchange studies play no role in standard agency analysis. However, such preferences could reduce the profit-maximizing effectiveness of optimal agency contracts, if as prior research suggests, employees expect the firm to maintain a reciprocal relationship with them and retaliate when the firm fails to do so (Robinson, Kraatz, and Rousseau 1994; Rousseau 1995).
Because optimal agency contracts are designed to pay the lowest wage necessary to induce the highest effort consistent with profit maximization, such contracts could be perceived as violating the reciprocity norm. If employees punish firms that offer theoretically optimal contracts for violating reciprocity by reducing their effort or rejecting the contracts, the profit-maximizing effectiveness of the contracts would be impaired.

We conduct three experiments using experimental labor markets to address a number of related research questions: 1) how employees respond to being offered an optimal agency contract versus a theoretically suboptimal reciprocity-based gift-exchange contract when each contract is the only contract available in the market, 2) how employees respond to these two contracts in a market where the firm chooses which one to offer, 3) whether firms’ contract offers depend on how employees react to those offers, and 4) how employees and firms react to a new alternative contract that incorporates important features of both the theoretically optimal and reciprocity-based contracts.

The results of our first experiment provide evidence that the optimal agency contract for our experimental setting is reasonably effective as a profit maximizing contract in that it yielded significantly higher firm profit than the reciprocity-based gift-exchange contract when each contract was the only contract available in the market. However, the results of our second experiment show that when both contracts were available and firms could choose which one to offer, firm profit from the optimal contract decreased significantly because employees punished firms for offering it, either by reducing their effort or rejecting the contract entirely. Consequently, in later periods, firm profit under the reciprocity-based gift-exchange contract was statistically
indistinguishable from that under the optimal contract. Moreover, in later periods after firms were repeatedly punished by employees, firms began offering the reciprocity-based contract more often than the optimal contract. These results are consistent with our expectation that the profit-maximizing effectiveness of optimal agency contracts can be impaired relative to the standard agency prediction if they are viewed as violating the reciprocity norm.

The results of our third experiment show that a new hybrid contract that retains the most powerful feature of the optimal agency contract (the “forcing” feature), but also includes the defining feature of the gift-exchange contract (the “reciprocity” feature) can be more effective than either the standard optimal agency contract or the gift-exchange contract alone. In a labor market where firms could choose which of the three contracts to offer, the new hybrid contract yields the highest employee effort, the highest employee payoff, firm profit that is directionally higher than, but statistically indistinguishable from, firm profit under the optimal contract, and the highest social welfare (total firm and employee payoff). In addition, although firms choose to offer the three contracts with similar frequency in the first period, they quickly shift to offering the hybrid contract far more often than either of the other contracts in subsequent periods, so that across all periods firms offered the hybrid contract 72% of the time. The gift-exchange contract is offered very infrequently across all periods (9% of the time); and, although the optimal contract is offered slightly more often than the gift-exchange contract in the earlier periods, employees punished firms that offered it by providing the lowest possible effort or rejecting the contract entirely. Consequently, by the last period 95% of firms offered
the hybrid contract, and no firm chose to offer the optimal contract (one firm offered the gift-exchange contract).

Overall, our results suggest that optimal contracts designed using standard agency analysis may not be as effective as the underlying theory suggests, and that incorporating preferences for reciprocity into the design may yield more effective contracts. We believe this a rich area of study that can help analytical management accounting researchers derive employment contracts and control systems that are more descriptive of current practice and potentially more useful as guides to practice.

II. Experiment 1

Theory and Hypothesis

To illustrate the important features of an optimal agency contract versus a gift-exchange contract, we adopt the simple setting used in several previous gift-exchange studies (Fehr, Kirchsteiger, and Reidl 1993; Fehr et al. 1998; Hannan, Kagel, and Moser 2002; and Hannan 2005). In this setting, a firm hires an employee to provide effort in production. Employee effort is notobservable, and therefore not contractible. Firm profit is observable to both the firm and the employee. The firm’s profit ($G$) and employee’s net utility ($U$) are:

\[ G = (q - w)e \]

\[ U = w - c(e). \]

where: $q =$ an exogenously given constant representing revenue to the firm;
\[ w = \text{the firm’s wage offer}; \]
\[ e = \text{the employee’s effort}; \]
\[ c(e) = \text{the cost of effort, which increases with the level of effort}. \]
The employee’s set of possible effort levels and the associated costs are common knowledge. Under standard agency theory, the optimal incentive contract for this setting is the one that solves the following problem for the firm:

Maximize \( [(q - w)e] \)

subject to:
\[
\begin{align*}
    w - c(e) & \geq U_0 \\
    w - c(e) & \geq w - c(e')
\end{align*}
\]

where: \( U_0 = \) the employee’s reservation net utility; \( e, e' \in E \) and \( e \neq e' (E = \) the employee’s set of possible effort levels). 

The solution to this problem is well-known. Since the link between employee effort and firm profit is not affected by any external uncertainty, the firm is able to perfectly infer the employee’s effort by observing firm profit. Therefore, the firm should use the following “forcing” contract (Harris and Raviv 1978):

\[
\begin{align*}
    w &= w_H = c(e^*) + U_0 \quad \text{if } G = (q - w_H)e^*; \quad \text{and} \\
    w &= w_L, \quad \text{otherwise.}
\end{align*}
\]

where: \( e^* = \) the effort level that maximizes firm profit; \( w_L < w_H \).

Under this contract, a rational employee will always choose \( e^* \) because it is the only incentive compatible effort choice. Thus, the firm achieves the first-best outcome by simply paying the market-clearing wage \( (w_H) \).

The previous gift-exchange experiments that used the setting describe above were silent regarding whether firm profit was contractible. If firm profit is assumed to be contractible, the contract used in the previous gift-exchange studies would be theoretically suboptimal. That contract allowed firms to offer any wage they wished within the specified range, and then the employees who accepted a wage offer could choose any effort level they wished within the specified range. Under this contract, the
conventional sub-game perfect equilibrium is that, regardless of the firm’s wage offer, the employee will always choose the lowest effort possible to maximize his net payoff. Anticipating this, the firm would always offer the lowest wage possible.

In contrast to the conventional equilibrium prediction, the experiments that tested the gift-exchange contract described above (Fehr, Kirchsteiger, and Reidl 1993; Fehr et al., 1998; Hannan, Kagel, and Moser 2002; and Hannan 2005) found that both firms’ wage offers and employees’ effort levels were higher than the sub-game perfect equilibrium predictions, and that effort levels were positively associated with wage offers.¹ In addition, firm profit generated by employees’ reciprocal effort was, on average, higher than if the firm had paid only the sub-game perfect equilibrium wage. These results provided support for Akerlof’s (1982) gift-exchange theory.² However, such evidence does not fully address the economic implications of reciprocity because the gift-exchange contract used in these studies is a theoretically suboptimal contract. That is, if firm profit is contractible, the theoretically optimal agency contract is the forcing contract described earlier. Thus, the hypothesis we test in Experiment 1, which is based on standard agency analysis, is:

**H1:** The theoretically optimal contract for a specific setting will produce higher firm profit than a gift-exchange contract in that same setting.

**Experimental Setting and Contracts**

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¹ Reputation effects were precluded in these gift-exchange studies, so firms’ higher wage offers cannot be interpreted as an attempt to form a reputation for cooperating with employees in order to generate more firm profit in future periods.

² Gift-exchange theory has also been supported by field and archival research (see, e.g., Raff and Summers 1987; Blinder and Choi 1990; Agell and Lundborg 1995; Campbell and Kamlani 1997; Huang et al. 1998; Bewley 1999). However, to control for potential confounds in the field, experiments have proven to be a very useful tool to test the predictive validity of the gift-exchange model.
The market setting used in Experiment 1 (and in our subsequent experiments) is the same as that described above with the parameters used by Hannan, Kagel, and Moser (2002) and Hannan (2005). The firm’s profit function is: 4

\[ \text{Firm Profit} = (120 - \text{wage}) \times \text{Employee effort} \]

where: \( \text{wage} \in \{20, 21, \ldots, 120\} \).

employee effort \( \in \{0.1, 0.2, \ldots, 1.0\} \).

The employee’s net payoff is:

\[ \text{Employee’s net payoff} = \text{wage} - \text{cost of effort} \]

where: the cost of effort to the employee is as follows:

<table>
<thead>
<tr>
<th>Effort</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
<th>0.8</th>
<th>0.9</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

Firm profit is observable to both the firm and the employee. The employee’s effort level is not observable, and therefore not contractible. Because the link between employee effort and firm profit is not affected by any external uncertainty, the firm can perfectly infer the employee’s effort by observing firm profit. Because there is no external uncertainty, risk preferences do not affect firms’ or employees’ behavior. The employees’ reservation net payoff is 20.

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3 There is a minor parametric difference in the employee’s payoff function between this study and previous studies. The previous studies assume that employees’ reservation net utility is zero, and impose on employees a fixed cost of 20. In this study, the reservation net utility is set at 20 and the fixed cost is eliminated in order to avoid the situation where, under the optimal agency contract, employees receive a zero net payoff even if they choose the effort level desired by the firm (i.e., there is no financial motivation for them to choose the desired effort level). That is, in this study, employees receive a positive payoff if they choose the effort level induced by the optimal agency contract, providing them with a monetary motivation to do so. This parametric change does not cause any difference in the predictions of interest regarding firms’ or employees’ behavior between this study and the previous studies.

4 In the experiments reported in this paper, all payoffs were expressed in “lira,” an experimental currency. At the end of the experiment, participants’ earnings were converted to dollars at the rate of 50 lira = $1.00.
For this setting, the optimal contract (hereafter the “OPT contract”) is determined by solving the maximization problem identified earlier using the parameters shown above. This yields the following optimal contract:

- \( w = 38 \) if firm profit is 82 (when the employee chooses an effort level of 1)
- \( w = 15 \) if firm profit is not 82 (when the employee chooses any other effort level)

Faced with this contract, rational employees will always choose effort level 1 and earn a payoff of 20 (wage of 38 minus the cost of effort of 18), and this produces firm profit of 82 (revenue of 120 minus wage of 38).

For the basic setting described above, the gift-exchange contract (hereafter the “GE contract”) allows the firm to offer any wage between 20 and 120 and the employee to respond with any effort level between .1 and 1.0. This contract is theoretically suboptimal because theory predicts that rational employees will always choose the lowest effort level (.1) and, anticipating this, the firm will always offer the lowest wage (20). Thus, theory predicts that firm profit is 10 under the GE contract [(revenue of 120 – wage of 20) \( \times \) effort of 0.1], which is lower than the firm profit of 82 achieved under the OPT contract. The employee’s payoff under the GE contract is 20, the same as under the OPT contract.

**Design and Procedures**

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5 The maximization problem is solved using Grossman and Hart’s (1983) approach, with an additional constraint, \( w - c(e) \geq 0 \) for all \( e \)’s, to eliminate the possibility of participants having a negative payoff, which, as a consequence of participants’ loss aversion (Tversky and Kahneman 1991), could have biased the experimental results. Under this approach, the firm’s problem is to choose the contract that maximizes firm profit from among the contracts that implement every possible effort level with the minimum cost to the firm. The contract resulting from applying this approach offers a high wage \( (w_H) \) of 38 when firm profit is 82. The wage for any firm profit other than 82 is set low \( (w_L) \) so that the employee’s net payoff is lower than if s/he chooses effort level 1. Specifically, \( w_L \) is set at 15, rather than 20, to avoid the situation where employees are indifferent between choosing effort level 1 and 0.1. Adding the constraint and setting \( w_L \) at 15 do not change any of the economic predictions regarding firms’ and employees’ behavior.

6 Although the nominal amount of the market-clearing wage differs between the OPT contract (38) and the GE contract (20), both contracts pay employees their reservation utility wage of 20. That is, the employee’s payoff net of the cost of effort is identical under the OPT contract (wage of 38 – cost of effort of 18 = 20) and the GE contract (wage of 20 – cost of effort of 0 = 20).
There are two between-subject contract conditions in Experiment 1: GE contract and OPT contract. In the GE contract condition, the GE contract is the only contract available in the market. In the OPT contract condition, the OPT contract is the only contract available in the market.

Participants in Experiment 1 were 80 MBA students, with an average of 5.5 years’ full-time work experience. Four experimental sessions were conducted for each of the two contract conditions. In each experimental session, ten participants were randomly assigned the role of firm or employee (five in each role), and they retained this role throughout the session. The data from the four sessions for each contract condition were pooled since there were no significant differences across sessions. Therefore, the final data set contains 20 firms and 20 employees in each of the two contract conditions.

In each session, firms and employees interacted for 6 periods. To ensure anonymity, firms and employees were identified only by numbers. To further ensure anonymity and preclude reputation formation, new firm (employee) numbers were assigned to each firm (employee) at the start of each of the 6 periods. Firms and employees were also divided by a screen that prevented them from seeing each other, but allowed all participants to see the experimenter and a blackboard in the front of the room.

At the start of each session, the experimental instructions were read aloud to all participants. After an overview of the experimental setting and task was provided, the specifics of the contract for that session (either OPT or GE) were explained in detail (see

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7 Labor markets with an equal number of firms and employees are used in our experiments for two reasons: First, prior research shows that the market’s supply-and-demand condition has little impact on the gift-exchange relation (Fehr et al. 1998; Brandts and Charness 2004). Second, although some labor markets may have excess supply or excess demand, examining a balanced market provides a benchmark for possible future studies.
Throughout the session, participants in either of the contract conditions were unaware of the existence of the other contract. Terms such as “gift-exchange” and “optimal” were not used to avoid biasing participants’ behavior. The contract used in any session was simply referred to as “the employment contract.” A spreadsheet showing both firm profit and the employee’s net payoff for every possible wage-effort combination under the contract used for that session was provided to all participants for use throughout the session. Before the start of the first period of each session, participants completed a series of exercises to ensure that they fully understood the instructions, the setting, their contract, and how to read the payoff spreadsheet.

For the GE contract sessions, each of the six periods consisted of steps in the timeline shown in Panel A of Figure 1. In Steps 1 and 2, firms decided whether to enter the labor market for that period, and those that did, decided on a wage offer and recorded it on their personal record sheet (used to determine their payoff for the period) and a communication form (used to communicate information to employees). Firms that chose not to enter the labor market received zero profit for that period. Communication forms were then collected from firm participants and all wage offers and associated firm numbers were posted on the blackboard in the front of the room. In Step 3, the employee numbers randomly assigned for that period determined the order in which employees could accept a wage offer (i.e., employee #1 had the first opportunity; employee #2 had the second opportunity, etc.). When an employee’s turn came, he could accept any one of the posted wage offers that was still available, in which case the communication form from the firm containing that wage offer was given to him. Alternatively, he could
choose not to accept any offer, in which case his payoff for that period was zero. Once a specific firm’s wage offer was accepted it was not longer available to any other employee.

(Figure 1)

In Step 4, each employee who accepted a wage offer in Step 3 chose an effort level and recorded it on the communication form, which was then passed back to the firm participant so he could calculate his profit (Step 5). Employees calculated their payoffs (Step 5) after recording their effort choice on their personal record form. The period ended when the experimenter collected the completed personal record sheets from both firms and employees. The procedures in Steps 1-5 described above were repeated for each of the six periods.

The procedures for the OPT contract sessions were the same as for the GE contract sessions shown in Panel A of Figure 1, except that in Step 2 the OPT contract was the only contract that the firm could offer (see Panel A of Figure 1). Because wage offers were fixed and dichotomous under the OPT contract (i.e., the wage is 38 if firm profit is 82, otherwise the wage is 15), firms did not need to decide on a wage offer in Step 2. The experimenter simply posted on the blackboard the identification numbers of the firms that chose to enter the labor market (all offering the same OPT contract and wages), and, in Step 3, employees chose either to accept a specific firm’s contract or to remain unemployed. All other procedures were identical to those for the GE contract sessions.

Results of Experiment 1
Panel A of Table 1 provides descriptive statistics for Experiment 1. For each contract, the table reports average firm profit, firms’ average wage offer, employees’ average effort level, the percentage of effort level 1 responses (highest effort level), the percentage of effort level 0.1 responses (lowest effort level), the percentage of contract rejections, the average worker’s payoff, and average total wealth (firm profit + worker’s payoff). The highest effort level (1) represents the optimal effort level under the OPT contract. The lowest effort level (0.1) represents the theoretically predicted effort level for the GE contract. The lowest effort level also represents the amount of effort an employee would be most likely to choose if he wanted to punish a firm for offering the OPT contract because this choice imposes the largest penalty on the firm at the lowest cost to the employee.

(Table 1)

H1 predicts that the OPT contract will yield higher firm profit than the GE contract. Consistent with H1, a regression of firm profit on contract type (i.e., GE or OPT) shows that firm profit was significantly higher ($t = 10.51; p < 0.001$, one-tailed) for the OPT contract (63) than for the GE contract (23). Moreover, Panel A of Figure 1 shows that firm profit for the OPT contract exceeded that for the GE contract over all 6 periods, and that there was little change in firm profit across the six periods for either contract.

(Figure 2)

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8 In this study, all regression analyses that involve within-subject observations include the subject as a cluster variable to control for repeated measures. That is, our regression models treat each subject’s responses as a cluster, and estimates robust standard errors after adjusting for intra-cluster correlations (Williams 2000; Wooldridge 2002).
Both firms’ and employees’ behavior under the GE contract was consistent with the prior gift-exchange study results in that, as shown in Panel A of Table 1, both firms’ average wage offer (58) and employees’ average effort level (0.41) were higher than (t-test: ps < 0.001) the conventional sub-game perfect equilibrium predictions for the GE contract (wage = 20 and effort = 0.1). In addition, a Tobit regression of effort on wage yields a positive association (z = 3.26; p = 0.001, two-tailed), suggesting that firms and employees exchanged gifts.9 Although these findings replicate prior evidence of reciprocity between firms and employees under the gift-exchange contract, the OPT contract still produced higher firm profit (63) than the gift-exchange contract (23) because, under the OPT contract, a substantial percentage of employee effort choices (66%) were effort level 1 as predicted under standard agency analysis. However, it is important to note that while these high effort choices yielded higher profit under the OPT, the remaining 34% of employee effort choices under the OPT were inconsistent with the standard agency prediction. Moreover, as shown in Panel A of Table 1, 21% of employee effort choices were the lowest possible level (0.1), which imposed the maximum punishment on the firm at the lowest cost to the employee.

III. Experiment 2

Theory and Hypotheses

As indicated earlier, the optimal agency contract is designed to pay the lowest wage that is sufficient to “force” employees via incentives to select the effort level that maximizes firm profit. Although this is a critical feature of the optimal agency contract, the contract’s non-reciprocal nature may be less salient to employees in a market where

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9 The Tobit model controls for the fact that the dependent measure, effort, is a censored value.
no alternative contract is available for comparison, as was the case in Experiment 1. On the other hand, in a market where both the reciprocity-based gift-exchange contract and the optimal agency contract are available, employees may be more likely to view the optimal contract as non-reciprocal. If, despite this, a firm chooses to offer the optimal contract, employees might punish the firm by providing lower effort or by rejecting the contract entirely, even in cases where such actions are costly to them. Such actions by employees would reduce firm profit. This leads to the first hypothesis we test in Experiment 2:

**H2:** When firms offer the optimal agency contract in markets where the gift-exchange contract is also available, firm profit will be lower than when firms offer the optimal agency contract in markets where only the optimal contract is available.

In actual labor markets, employees are likely to face a variety of employment contracts. In markets where both the OPT and GE contracts are available, employees are likely to gain a better understanding of the payoff implications of each contract as they actually experience these payoffs. This suggests that experience will enable employees to see more clearly the non-reciprocal nature of the optimal contract versus the reciprocal nature of the gift-exchange contract, and therefore be more likely to punish firms that offer the optimal contract. This would lead to a decrease in firm profit under the optimal contract as firms gain experience with the contracts, which, in turn, would decrease the difference in firm profit between the two contracts over time. In the extreme case, the difference in firm profit could even reverse, so that the gift-exchange contract would produce higher firm profit than the optimal contract. Because there is no clear basis on which to predict which of the two contracts will yield higher firm profit as employees
gain experience with the contracts, we do not offer a directional hypothesis, but rather simply pose the issue as a research question.

When deciding which contract to offer, firms will likely consider employees’ reaction to their contract offers. Some firms may anticipate that employees will react negatively to the optimal agency contract, and therefore begin by offering the gift-exchange contract. Other firms will likely start off by offering the optimal agency contract in hopes of maximizing their profits, but then switch to offering the gift-exchange contract if their initial strategy proves ineffective. Shields and Waller (1988) find that firms are adaptive in revising their contracts based on previous outcomes. Kagel, Kim, and Moser (1996) find that, in a one-shot, repeated-play sequential response game, proposers who made offers that allocated payoffs in a self-serving manner were penalized by responders, and therefore the proposers were “forced” to make higher offers. Similarly, firms that initially offer the optimal agency contract may learn from experience that employees’ react negatively and therefore switch to offering the gift-exchange contract. This leads to our third hypothesis:

**H3:** When given a choice between offering the optimal agency contract or the gift-exchange contract, firms will offer the gift-exchange contract more often as they gain experience with the contracts

**Design and procedures**

We test Hypotheses 2 and 3 and our research question described above in Experiment 2 using a labor market in which firms could choose to offer either the GE contract or OPT contract from Experiment 1. Participants were 40 MBA students, with an average of 5.2 years’ full-time work experience. Four experimental sessions were conducted. As in Experiment 1, in each session, ten participants were randomly assigned
the role of firm or employee (five in each role), and they retained this role throughout the session. The data from the four sessions for each contract condition were pooled since there were no significant differences across sessions. Therefore, the final data set contains 20 firms and 20 employees. Because we expected employees and firms to change their behavior over time as they gained experience with the contracts, participants interacted for 12 periods in each session rather than for 6 periods as in Experiment 1.

Panel B of Figure 1 provides a timeline of the steps in Experiment 2. The procedures are the same as to those for Experiment 1, except that in Step 2, the firm chooses which of the two contracts (GE or OPT) to offer. After a firm has offered a contract, all other procedures for the GE and OPT contracts are the same as those described earlier for Experiment 1.

**Results of Experiment 2**

Descriptive data for Experiment 2 are reported in Panel B of Table 1 in the same format as for Experiment 1. H2 predicts that, when firms offer the OPT contract when both contracts are available, firm profit will be lower than when the OPT contract is the only contract available. We test this hypothesis by comparing firm profit for the OPT contract in Experiment 1 (when it was the only contract available; Panel A of Table 1) with that for the OPT contract in periods 1 – 6 of Experiment 2 (when both contracts were available; Panel B of Table 1). Consistent with H2, a regression of firm profit on market condition (Experiment 1 versus Experiment 2) shows that firm profit was significantly lower ($t = 4.86; p < 0.001$, one-tailed) for the OPT contract when both contracts were available (33) than when only the OPT contract was available (63). Firm profit was lower when both contracts were available because employees chose the
theoretically optimal effort level (1) significantly less often (Fisher’s exact test, $p < 0.001$, one-tailed) when both contracts were available (36%) than when only the OPT contract was available (66%), and rejected the OPT contract significantly more often (Fisher’s exact test, $p < 0.001$, one-tailed) when both contracts were available (32%) than when only the OPT contract was available (0%). These results are consistent with the underlying reasoning offered for H2 that employees would react more negatively to the OPT contract if firms choose to offer when they could have offered the reciprocity-based GE contract.

Our research question for Experiment 2 asks whether the GE or OPT contract produces higher firm profit as employees and firms gain experience with these contracts. We begin by regressing firm profit on contract type (GE or OPT) for Periods 1 – 6 of Experiment 2. The result indicates that firm profit was higher ($t = 2.83; p = 0.01$, two-tailed) under the OPT contract (33) than under the GE contract (15). However, for periods 7 – 12, regressing firm profit on contract type indicates that firm profit was no longer significantly different ($t = 0.69; p = 0.50$, two-tailed) between the OPT contract (24) and the GE Contract (17). As shown in Panel B of Figure 2, firm profit is similar across the two contracts beginning with Period 3. Consistent with this observation, by-period regressions of firm profit on contract type show that the OPT contract produced significantly higher firm profit than the GE contract only in Periods 1 and 2. Thus, we find that, as participants gain experience with the contracts, the firm profit produced by the OPT contract, while still directionally higher, is statistically indistinguishable from, firm profit produced by the reciprocity-based GE contract.
H3 predicts that, with experience, firms will offer the GE contract more often. Panel A of Figure 3 reports the percentage of firms that offered the GE and OPT contracts for periods 1-6, 7-12, and 1-12, and provides a graph of the percentages of firms that offer GE and OPT contracts by period. The increase in the percentage of GE contracts from Periods 1 – 6 (49%) to Periods 7 – 12 (59%) was marginally significant (Fisher’s exact test, p = 0.09, one-tailed). In addition, a logistic regression of firms’ contract choices on period shows that, over all twelve periods, firms were marginally more likely (p = 0.07, one-tailed) to offer the GE contract in later periods. These results provide modest support for H3.

(Figure 3)

Further analyses examined whether the firms’ observed shift toward the GE contract in later periods is consistent with employees reacting negatively to the OPT contract. Consistent with this explanation, we find that the more often employees responded to the OPT contract by providing a non-optimal level of effort (i.e., effort levels lower than 1), the less likely firms were to offer the OPT contract (t = 2.27; p = 0.04, two-tailed). This result provides evidence consistent with our interpretation that firms began to shift to offering the GE contract in later periods in response to being punished for offering the OPT contract.

IV. Experiment 3

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10 Tested with a regression of the percentage of a firm’s OPT contract offers over the twelve periods on: 1) the percentage of OPT contracts offered by the firm that elicited an effort level lower than 1, and 2) the average profit earned by the firm when it offered the GE contract. The latter variable is included as a control variable because the more a firm earned under the GE contract, the more willing it might be to offer the GE contract. Controlling for this possibility allows us to isolate the effect of employees’ negative reaction on the firms’ contract offers.
Theory and Research Question

The results of Experiment 2 show that employees react more negatively to the OPT contract when firms choose to offer it even though they could have offered the more reciprocal GE contract. Despite this, the OPT contract still yields firm profit that is directionally higher than, but statistically indistinguishable from, firm profit for the GE contract. The apparent reason for this result is that the OPT contract was able to “force” some, but not all, employees to provide high effort, which, in turn, produces high firm profit. Nevertheless, the OPT contract performs much less effectively than standard agency theory predicts. On the other hand, the GE contract yields more firm profit than standard agency analysis predicts because employees provide unenforceable reciprocal effort in exchange for theoretically unpredicted high wage offers from firms. This raises the question of whether a contract that combines the most powerful features of both contracts might be more effective than either contract alone.

A powerful feature of the OPT contract is the “forcing” feature. Employees are forced to provide the effort level that maximizes the firm’s profit because this is the only way they can maximize their own payoffs. A powerful feature of the GE contract is the “reciprocity” feature. Employees apparently prefer to work under a contract that allows firms to elicit reciprocal effort by offering a higher wage. More importantly, employees, in fact, do reciprocate with higher effort when firms offer a higher wage. Thus, both the “forcing” feature of the optimal contract and the “reciprocity” feature of the gift-exchange contract help firms increase their profit.

The question we address in Experiment 3 is whether a new hybrid contract that combines both the “forcing” feature of the OPT contract and the “reciprocity” feature of
the GE contract can be more effective than either the optimal contract or gift-exchange contract alone. That is, we examine whether such a contract can generate as much or more firm profit than either the optimal contract or the standard gift-exchange contract, while also providing as much or more payoff for the employee. If this were the case, we would expect that firms would offer this new hybrid contract more often than either of the other contracts, especially as firms and employees gain experience with the contracts.

**Design and procedures**

The design of Experiment 3 is the same as for Experiment 2, except that in Experiment 3, firms are allowed to offer one of three contracts: 1) the OPT contract 2) the GE contract, or 3) a new hybrid contract (hereafter, the HYB contract) that combines the “forcing” feature from the OPT contract, with the “reciprocity” feature from the GE contract. Incorporating the forcing feature in the HYB contract means that, as with the OPT contract, employees can only receive the high wage (now set by the firm) if they provide the highest effort level (1), otherwise they received a low wage (15). Incorporating the reciprocity feature in the HYB contract means that firms can set the wage that employees earn if the employees provide the highest effort level (1). That is, under the HYB contract, firms could choose to set the wage above the fixed optimal level of 38 for the OPT contract (possible wage offers range from 20 to 120), and thereby try to induce reciprocal effort from employees.

Participants were 40 MBA students, with an average of 4.2 years’ full-time work experience. Four experimental sessions were conducted. As in Experiments 1 and 2, in each session, ten participants were randomly assigned the role of firm or employee (five in each role), and they retained this role throughout the session. The data from the four
sessions for each contract condition were pooled since there were no significant
differences across sessions. Therefore, the final data set contains 20 firms and 20
employees.

A timeline of the steps for Experiment 3 is shown in Panel C of Figure 1. All
steps are the same as for Experiment 2 (See Panel B of Figure 1), except that in Step 2,
firms could choose one of three contracts as explained above. Procedures for the GE and
OPT contract are the same as for Experiments 1 and 2. Procedures for the HYB contract
are the same as for the OPT contract, except that, as is the case for the GE contract, firms
make a wage offer in Step 2.

Results of Experiment 3

Panel C of Table 1 reports descriptive statistics for Experiment 3 and Panel C of
Figure 2 and Panel B of Figure 3 depict the average firm profit and frequency of contract
offers, respectively. Our main research question for Experiment 3 is whether the new
HYB contract can generate more firm profit than the OPT and GE contracts. We begin
our analysis by comparing average firm profit for the three contracts across all 12
periods. Regressions of firm profit on contract type show that firm profit for the HYB
contract (48) is directionally higher than, but statistically indistinguishable from (t = 0.45;
p = 0.66, two-tailed), that for the OPT contract (43); whereas firm profit for the GE
contract (14) is significantly below (p ≤ 0.01, two-tailed) that for either of the other two
contracts. Because the firm profit for the GE contracts is well below that for the OPT and
HYB contracts, the rest of our analysis focuses only on the latter two contracts.

Despite the similarity in average firm profit for the HYB and OPT contracts, there
are differences on other important measures. As shown in Panel C of Figure 2, Firm
profit was considerably more variable for the OPT contract than the HYB contract (Levene’s robust variance test: p < 0.001). Also, wage offers are significantly higher (t = 9.57; p < 0.001, two-tailed) for the HYB contract (58) than for the OPT contract (fixed at 38), and this difference in wage offers apparently led to the significantly higher employee effort (t = 3.82; p < 0.001, two-tailed) for the HYB contract (.81) than for the OPT contract (.52). Consistent with the higher effort for the HYB contract than for the OPT contract, the percentage of lowest effort level (0.1) choices (16%) and contract rejection (4%) for the HYB contract (20% combined) were significantly less (Fisher’s exact test: p < 0.001, two-tailed) than for the OPT contract (41% + 11% = 52% combined). As explained more fully below, these differences are consistent with employees punishing firms for offering the OPT contract and rewarding firms for offering the more reciprocal HYB contract.

The most striking difference between the HYB and OPT contracts is in the percentage of times that firms chose to offer each of them. As shown in Panel B of Figure 3, across all 12 periods, firms chose to offer the HYB contract 72% of the time, while offering the OPT contract only 19% of the time. Moreover, in the first period, the HYB and OPT contracts were offered with similar frequency (40% and 35% of contract offers, respectively), but the spread between the frequency of these two contract offers

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11 Tested by regressing wage and effort, respectively, on contract type (OPT or HYB).
12 An analysis of the order in which employees accepted the HYB and OPT contract offers provides further evidence that employees preferred the HYB contract to the OPT contract. As explained earlier, there were a total of 48 stand-alone markets in Experiment 3 (4 sessions with 12 periods in each session). At least one firm (often most firms) chose to offer the HYB contract in all 48 markets, and the HYB contract was the first contract accepted by an employee in 39 of these 48 markets. Compare this to the OPT contract, which was offered by at least firm in only 23 of the 48 markets, and which was the first contract accepted by an employee in only 1 of those 23 markets (i.e., the OPT contract was the last contract accepted in 22 of the 23 cases). These results show that employees strongly prefer the HYB contract to the OPT contract.
increased rapidly, so that by the last period, 95% of the firms offered the HYB contract, while no firm offered the OPT contract (one firm offered the GE contract).

To understand why virtually all firms offered the HYB rather than the OPT contract in the later periods, we need to return to the results for employee effort and firm profit. In order for the OPT contract to produce the theoretically predicted firm profit of 82, all employees facing the OPT contract must provide the theoretically optimal effort level (1) every time they face the OPT contract. In contrast to this prediction, employees facing the OPT contract only provided the optimal effort level 48% of the time. Employees’ lower effort levels (or contract rejections) in the other 52% of the cases resulted in average firm profit of only 43. Compare these results to those for the HYB contract, where employees chose the highest effort level (1) 79% of the time, which, when combined with the smaller number of times that employees provided a lower effort level or rejected the contract (21% combined), resulted in average firm profit of 48.

These results are consistent with firms experiencing employees’ negative reaction to the OPT contract and responding by shifting to offering the HYB contract. It is important to note that firms did not make themselves worse off by shifting to offering the HYB contract rather than the OPT contract. That is, as reported earlier, firm profit under the HYB contract was actually directionally higher than, but statistically indistinguishable, from that under the OPT contract.

A final observation that helps explain why the HYB contract dominated the market in Experiment 3 is that it yields higher social welfare. As can be seen in Panel C of Table 1, the total wealth generated by the HYB contract (86) is higher than (t = 2.55; p
This is primarily due to the significantly higher ($t = 10.9; p < 0.001$, two-tailed) employee payoffs for the HYB contract (38) than for the OPT contract (16).\textsuperscript{14}

In summary, it appears that what is happening in the labor market in Experiment 3 is that firms learn that employees’ negative reaction to their OPT offers cause their profit to drop substantially. In response, they switch to offering the HYB contract, which results in enough reciprocal employee effort to make the firm profit from the HYB contract equal to, or higher than, firm profit under the OPT contract. Thus, the market settles into a pattern of HYB contract offers that produce welfare gains for employees, while simultaneously producing firm profit at least as high as under the OPT contract.

\section*{V. Discussion and Conclusion}

We report the results of three labor market experiments designed to examine the effectiveness of an optimal agency contract as compared to two alternative contracts. The first alternative contract is a reciprocity-based gift-exchange contract used in a series of previous studies. For example, Hannan (2005) used this contract in her study of the effects of wages and firm profit on employee effort, and demonstrated, among other things, that reciprocity between firms and employees can yield higher firm profit than standard agency analysis predicts. Moreover, the accounting literature suggests that it may be possible to take advantage of this reciprocity norm to motivate employee effort (Sprinkle 2003).

\footnote{Tested by regressing the combined firm profit and worker’s net payoff under each contract offer on contract type (OPT or HYB).}

\footnote{Tested by regressing worker’s net payoff on contract type (OPT or HYB).}
However, since prior studies did not compare the results for the sub-optimal gift-exchange contract with results for the optimal contract, the importance of those studies for analytical accounting research remains unclear. That is, from an agency perspective, firms should maximize profit by adopting the optimal agency contract, and therefore would not need to rely on gift exchange. Our study addresses this issue directly by examining both contracts. We find that, consistent with standard agency analysis, the optimal agency contract yields higher firm profit than the gift-exchange contract, but only in markets where the only contract available is either the optimal contract or the gift-exchange contract. However, in markets where firms can choose to offer either of the two contracts, employees punish firms that offer the optimal contract by reducing effort or rejecting the contract. This results in lower firm profit, especially as firms and employees gain experience with the contracts, so that by the later periods of the experiment firm profit under the optimal contract, while still directionally higher, is statistically indistinguishable from that under the gift-exchange contract.

The second alternative contract we consider is a hybrid contract that combines the “forcing” feature of the optimal contract with the “reciprocity” feature of the gift-exchange contract. In a market where the firm can choose whether to offer the optimal contract, the gift-exchange contract, or the hybrid contract, we find that the hybrid contract dominates the market as firms and employees gain experience with the alternative contracts. Specifically, firms rarely offer the gift-exchange contract, and employees reduce their effort or reject the contract entirely when they are offered the optimal contract. Consequently, firms quickly switch to offering the hybrid contract rather than the optimal contract, so that in later periods of the market, virtually all firms
offer the hybrid contract. The hybrid contract yields the highest employee effort, the highest employee payoff, at least as much firm profit as the optimal contract, and the highest total wealth (combined firm and employee payoff).

Overall, these results suggest that optimal contracts derived using standard agency analysis are likely to be less effective than the theory suggests, and that incorporating preferences for reciprocity into contract design may yield more effective contracts. We believe this a rich area of study that can help analytical management accounting researchers derive employment contracts and control systems that are more descriptive of current practice and potentially more useful as guides to practice.

Specifically, many incentive systems used in practice appear to reflect both of the effort-inducing features we incorporated into our hybrid contract. This is understandable, as firms would be unlikely to offer a pure gift-exchange contract of the type examined in this and previous studies because the power of such contracts to generate effort and firm profit relies entirely on trusting employees to reciprocate if the firm pays a wage above the market-clearing level. Likewise, it is also unlikely that firms would rely exclusively on financial incentives to force employees to provide effort as is the case in optimal agency contracts because they understand that employees may react negatively to such contracts. Rather than rely exclusively on either financial incentives or reciprocity to induce effort, firms’ compensation policies most likely try to incorporate both features. For example, Hansen (2007) explains that in determining employees’ compensation, Microsoft Corporation uses a stringent, forced-distribution rating system to evaluate employee performance (a type of “forcing” feature); but then pays employees rated as top performers significantly more than other employees (a “reciprocity” feature).
Interestingly, while many compensation contracts may not explicitly include both the “forcing” and “reciprocity” features of the hybrid contract examined in our third experiment, the general characteristics of these features are likely to be part of the broader implicit compensation policies applied in practice (Rousseau 1989, 1995). For example, while many firms may not explicitly indicate what level of performance will result in an employee’s termination, there is still almost surely some implicit threat of being fired for poor performance (i.e., effort below a certain level will result in termination). Similarly, while there may not be an explicit statement regarding the amount of effort expected in exchange for a larger than expected pay raise, there is almost surely some implied or informally understood expectation that employees will increase their effort, or at least maintain their effort at an already high level (i.e., if you pay me more, I’ll reciprocate with more effort). Thus, we believe the “forcing” and “reciprocity” features included in our hybrid contract capture important aspects of many implicit compensation policies observed in practice. It is for this reason that we believe it is important for analytical accounting researchers to try to incorporate both of these features, rather than only the forcing feature, in their design of employment contracts and control systems.

A number of issues arising from this study warrant further research. For example, our experiments used a one-shot setting to preclude reputation formation. However, in practice firms and employees often have an on-going relationship over multiple periods. Future research could explore the issues raised in our study in a multi-period setting with fixed firm-employee pairings. Also, future research could investigate the behavior of firms and employees in environments in which employee’s effort choice cannot be
inferred with certainty by the firm. Finally, it may be useful to explore whether different 
levels of supply and demand of labor in the market would influence employees’ effort 
choices and firms’ contract offers.
References:


**Figure 1: Experimental timelines**

Panel A: Timeline of Experiment 1

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms decide whether to enter the labor market.</td>
<td><em>For GE contract</em>: Firms that enter the labor market make wage offers. <em>For OPT contract</em>: Firms that enter the labor market offer the OPT contract.</td>
<td>Employees accept a firm’s contract or do not accept any contract.</td>
<td>Employees privately choose an effort level.</td>
<td>Employees and firms compute their payoffs.</td>
</tr>
</tbody>
</table>

Panel B: Timeline of Experiment 2

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms decide whether to enter the labor market.</td>
<td>Firms that enter the labor market choose to offer either GE or OPT contract. For GE contract, the firm makes a wage offer.</td>
<td>Employees choose a firm to work for or not to work for any firm.</td>
<td>Employees privately choose an effort level.</td>
<td>Employees and firms compute their payoffs.</td>
</tr>
</tbody>
</table>

Panel C: Timeline of Experiment 3

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms decide whether to enter the labor market.</td>
<td>Firms that enter the labor market choose to offer GE, OPT, or HYB contract. For GE and HYB contracts, the firm makes a wage offer.</td>
<td>Employees choose a firm to work for or not to work for any firm.</td>
<td>Employees privately choose an effort level.</td>
<td>Employees and firms compute their payoffs.</td>
</tr>
</tbody>
</table>
Figure 2: Average firm profit by contract and period

Panel A: Experiment 1

Panel B: Experiment 2

Panel C: Experiment 3

Note: in period 9, 11, and 12, the dotted lines and the “x”s on the horizontal axis mean that the contract was not offered in that period.
Figure 3: Frequency of contract offers

Panel A: Percentage of contract offers by period for Experiment 2

<table>
<thead>
<tr>
<th>Contract</th>
<th>Periods 1-6</th>
<th>Periods 7-12</th>
<th>Periods 1-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>49%</td>
<td>59%</td>
<td>54%</td>
</tr>
<tr>
<td>OPT</td>
<td>51%</td>
<td>41%</td>
<td>46%</td>
</tr>
</tbody>
</table>

Panel B: Percentage of contract offers by period for Experiment 3

<table>
<thead>
<tr>
<th>Contract</th>
<th>Periods 1-6</th>
<th>Periods 7-12</th>
<th>Periods 1-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>15%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>OPT</td>
<td>28%</td>
<td>9%</td>
<td>19%</td>
</tr>
<tr>
<td>HYB</td>
<td>57%</td>
<td>88%</td>
<td>72%</td>
</tr>
</tbody>
</table>
Table 1: Descriptive Statistics for Experiments 1, 2, and 3

Panel A: Descriptive Statistics for Experiment 1 (separate markets for the GE and OPT contracts)

<table>
<thead>
<tr>
<th>Contract</th>
<th>Periods 1 – 6</th>
<th>Periods 7 – 12</th>
<th>All twelve periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GE (n=114)</td>
<td>OPT (n=119)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average firm profit</td>
<td>23</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Average wage offer</td>
<td>58</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Average effort</td>
<td>0.41</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Percentage of effort 1</td>
<td>5%</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>Percentage of effort 0.1</td>
<td>26%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Percentage of rejection</td>
<td>3%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Average worker’s payoff</td>
<td>53</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Average total wealth</td>
<td>76</td>
<td>81</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Descriptive Statistics for Experiment 2 (GE and OPT contracts available in the market)

<table>
<thead>
<tr>
<th>Contract</th>
<th>Periods 1 – 6</th>
<th>Periods 7 – 12</th>
<th>All twelve periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GE (n=57)</td>
<td>OPT (n=59)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average firm profit</td>
<td>15</td>
<td>33</td>
<td>16</td>
</tr>
<tr>
<td>Average wage offer</td>
<td>46</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>Average effort</td>
<td>0.21</td>
<td>0.39</td>
<td>0.22</td>
</tr>
<tr>
<td>Percentage of effort 1</td>
<td>4%</td>
<td>36%</td>
<td>3%</td>
</tr>
<tr>
<td>Percentage of effort 0.1</td>
<td>70%</td>
<td>32%</td>
<td>57%</td>
</tr>
<tr>
<td>Percentage of rejection</td>
<td>0%</td>
<td>32%</td>
<td>6%</td>
</tr>
<tr>
<td>Average worker’s payoff</td>
<td>43</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Average total wealth</td>
<td>57</td>
<td>44</td>
<td>49</td>
</tr>
</tbody>
</table>

Panel C: Descriptive Statistics for Experiment 3 (GE, OPT and HYB contracts available in the market)

<table>
<thead>
<tr>
<th>Contract</th>
<th>Periods 1 – 6</th>
<th>Periods 7 – 12</th>
<th>All twelve periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GE (n=18)</td>
<td>OPT (n=34)</td>
<td>HYB (n=68)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average firm profit</td>
<td>14</td>
<td>43</td>
<td>44</td>
</tr>
<tr>
<td>Average wage offer</td>
<td>61</td>
<td>38</td>
<td>58</td>
</tr>
<tr>
<td>Average effort</td>
<td>0.27</td>
<td>0.51</td>
<td>0.77</td>
</tr>
<tr>
<td>Percentage of effort 1</td>
<td>0%</td>
<td>47%</td>
<td>75%</td>
</tr>
<tr>
<td>Percentage of effort 0.1</td>
<td>67%</td>
<td>38%</td>
<td>19%</td>
</tr>
<tr>
<td>Percentage of rejection</td>
<td>0%</td>
<td>15%</td>
<td>4%</td>
</tr>
<tr>
<td>Average worker’s payoff</td>
<td>58</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td>Average total wealth</td>
<td>72</td>
<td>58</td>
<td>82</td>
</tr>
</tbody>
</table>

Notes:

a: Average firm profit = the mean profit for firms who offered the indicated contract.
b: Average wage offer = the mean wage that firms offered in the indicated contract. For OPT and HYB contracts, we only report the high wage that the employee would receive if effort level 1 was chosen. If effort was lower than 1, the wage would be fixed at 15.
c: Average effort = the mean effort level elicited by the indicated contract.
d: Percentage of effort 1 = (the number of the indicated contract that elicited effort level 1) / (the total number of the indicated contract).
e: Percentage of effort 0.1 = (the number of the indicated contract that elicited effort level 0.1) / (the total number of the indicated contract).
f: Percentage of rejection = (the number of the indicated contract that was rejected) / (the total number of the indicated contract).
g: Average worker’s payoff = the mean net payoff of workers who were offered the indicated contract.
h: Average total wealth = the mean of combined firm profit and worker’s net payoff under each contract offer for the indicated contract.