Negative Effects of Wage Claims on Labor Relations: An Experimental Study on a Gift Exchange Game*

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Abstract

We examine how wage claims influence the principal–agent relationship between firms and workers with hidden action by using laboratory experiments on a gift exchange game in which workers make payoff-irrelevant requests concerning their wage before the firm makes a wage offer. We compare the experimental results of this game with those of a gift exchange game without wage claims and find that wage claims reduce reciprocity regardless of the wage levels offered by the firm, resulting in shrinking the economic surplus in their labor contracts.

Keywords: cheap talk, bargaining, labor market, gift exchange game, economic experiment

JEL Classification Numbers: C92, J3, J42

1. Introduction

As noted by Akerlof (1982) and Akerlof and Yellen (1990), labor relations can be characterized as a "gift exchange" between those who may consider social norms such as fairness and reciprocity. Such social norms will induce workers to choose a higher effort in response to a firm’s generous fixed wage offer without explicit performance incentives. Indeed, a series of experiments on a gift exchange game (e.g., Fehr et al. 1993; Fehr et al. 1998; Fehr and Falk 1999; Brown et al. 2004), which models a principal–agent problem with hidden action, have qualitatively supported the "gift exchange hypothesis." In other words, firms’ wage offers and workers’ chosen effort levels are positively correlated even if efforts are not contractually enforceable.

This study examines experimentally how workers’ wage claims in contract bargaining affect the gift exchange relationships between workers and managers. Workers’ requests for wage hikes or contract wages (the "worker’s voice") are common in the workplace because of the changes in worker–management relations over the past few decades. These changes have included frequent job shifts (Neale and Bazerman 1991), the decentralization of wage bargaining, declining union densities (see, e.g., Dahl et al. 2013), and the increasing use of voice (or grievance) systems for employees in nonunion workplaces (see, e.g., Feuille and Delaney 1992). However, in most of the experimental studies of gift exchange games mentioned above, the wage is imposed by firms, as in a take-it-or-leave-it offer, or determined by market interactions such as double auctions. Thus, the literature cannot isolate how the worker’s voice affects reciprocal labor relations. Therefore, this study uses a laboratory experiment to investigate whether firms comply with workers’ claims, whether workers refuse contracts or shirk after accepting their contracts when firms fail to comply, and how the worker’s voice affects economic welfare.

2. Experimental Design and Procedure

2.1. Experimental design

Our experiment is based on a bilateral gift exchange game between firms and workers. The firm makes a wage offer \( w \in \{21, 36, 51, 66, 81, 96\} \) to its worker, who can accept or reject it. If the worker rejects wage offer \( w \), both the firm and the worker earn nothing: the payoff for both is 0 tokens (experimental currency unit). If the worker accepts the wage offer, the worker chooses effort level \( e \) from 0.1 to 1, in increments of 0.1. In this case, the payoff functions of the firm and the worker in terms of tokens are given by, respectively

\[
\pi = (120 - w) \times e \times 10, \\
u = (w - c(e) - 20) \times 10,
\]

where \( c(e) \) reflects the increasing effort costs, determined according to Table 1. Their payoffs are multiplied by 10, meaning that the firm’s payoff becomes an integer. These payoff functions are common knowledge among the firm and its workers.

Table 1. Effort levels and costs

<table>
<thead>
<tr>
<th>( e )</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</th>
</tr>
</thead>
<tbody>
<tr>
<td>( c(e) )</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>

*This research was financially supported by JSPS KAKENHI Grant Number 24730169. The authors are grateful to Hirokazu Takizawa for conducting some of the experiments at Chuo University

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This game is similar to the standard gift exchange game, except that the payoffs are multiplied by 10 and the wage offer domain is restricted to six kinds in order to adopt the strategy method (explained below) and represent the payoff of the firm and worker in a payoff matrix. The payoff matrix is not a strategic form of the game; rather, it shows both payoffs for any combination of the firm’s wage offer \( w \) and the worker’s effort level \( e \) assuming that the worker accepts \( w \).

The experimental design consists of two treatments: one is the above gift exchange game (GE), providing the baseline, while the other features the worker’s voice (GEV). Before the firm makes a wage offer to its worker, the worker tells the firm what wage offer \( v \in \{21, 36, 51, 66, 81, 96\} \) he or she is willing to receive. The worker’s voice is irrelevant to the payoff (i.e., it is just cheap talk). We adopt the strategy method to elicit the worker’s minimum acceptable wage (i.e., reservation wage) and the effort level schedule according to the wage offer, regardless of the treatment. Before the worker receives a wage offer (and after he or she tells the firm of his or her voice in the GEV), the worker decides the reservation wage \( w \in \{21, 36, 51, 66, 81, 96\} \) he or she is willing to receive. The test presents no variable. One token was converted into 1 yen and the reward was paid in cash to each subject after the session. The session lasted approximately two hours and subjects earned an average of 2,584 yen at Takasaki City University of Economics and 2,837 yen at Chuo University. The difference in the average rewards between the two universities was due to the difference in the fixed participation reward for the most part (84%).

2.2. Experimental procedure

We conducted two experimental sessions for GE and three for GEV between December 2013 and May 2014 at Takasaki City University of Economics and Chuo University, Japan. The details of each session are presented in Table 2. We recruited subjects by using an electronic mailing list, posters, and fliers. Participants were undergraduates in several departments who had not participated in any prior experiment using a gift exchange game. Each subject could participate in only one session. The number of subjects in each session was 30 at Takasaki City University of Economics and 24 at Chuo University. A total of 54 subjects participated in the GE and 84 subjects participated in the GEV. For all sessions, we used the z-tree software package provided by Fischbacher (2007).

Each session was conducted in a computer room with computer terminals divided into two groups (i.e., firms and workers) by a partition. Before the experiment began, subjects were randomly assigned their roles (firms or workers). After the assignment, workers (firms) were seated randomly in front of the computer terminal at the front (back) of the laboratory. Each desk had a calculator and an envelope containing all the experimental materials, including the instructions, a record sheet, practice problems, and an identification number card. To avoid potential experimenter effects, assistants other than the researcher acted as instructors. The instructor read the instructions aloud. Before the experiment commenced, subjects were instructed to solve the practice problems in order to concretize their understanding of the experimental instructions. The experiment began only after all subjects had answered correctly. During the experiment, subjects could observe the payoff matrix on their computer screen. To allow for learning effects, 10 rounds were conducted in each session, and the probability of meeting the same subjects twice was zero: in each round, each firm was exogenously matched with a new worker. The role of each subject remained fixed during the session and all trades were anonymous (i.e., the subjects did not know the personal identities of their trading partners).

Subjects’ reward was the fixed participation reward plus the tokens earned in the experiment, which was variable. One token was converted into 1 yen and the reward was paid in cash to each subject after the session. The session lasted approximately two hours and subjects earned an average of 2,584 yen at Takasaki City University of Economics and 2,837 yen at Chuo University. The difference in the average rewards between the two universities was due to the difference in the fixed participation reward for the most part (84%).

3. Results

No contract is signed if the firm’s offer is smaller than the worker’s minimum acceptable wage. Therefore, the established contract rate is an important outcome in our study. The first row in Table 3 indicates that the rates were 93% and 88% under the GE and GEV, respectively. This difference is found to be significant according to the Mann–Whitney U test. The second row shows the means of the worker’s minimum acceptable wage (i.e., their reservation wage). The test presents no
significant difference between the GE and GEV. The third row shows the means of workers’ efforts using observations on which contracts were established. The number of observations thus drops to 621 (251 and 370 in the GE and GEV, respectively). Even when focusing on subjects with established contracts, the difference in the worker’s effort between the GE and GEV is significant at the 1% level. Contrariwise, the firm’s offer does not differ among the treatments. These results imply that the worker’s voice may not influence the firm’s behavior but rather the worker’s effort does.

The fifth, sixth, and seventh rows show the means of the worker, firm, and total payoffs, respectively. The test does not show a significant difference in workers’ payoffs between the GE and GEV, whereas firm and total payoffs for the GEV are significantly less than those for the GE. These comparisons imply that the worker’s voice reduces workers’ reciprocal incentives regardless of the wage levels offered by the firm, consequently lowering the established contract rate, the workers’ effort in the contracted pairs, and total welfare.

Figure 1. Workers’ stated average relationship between the wage offer and effort

Note: Workers do not need to state an effort level below their stated reservation wage; we assign effort a value of 0 in that case. Therefore, the number of observations in the strategy method is 4,140 (6 x 10 rounds x 15 subjects x 3 sessions x 12 subjects x 2 sessions).

Table 3. Mean comparisons of the experimental outcomes for the GE and GEV

<table>
<thead>
<tr>
<th></th>
<th>GE (Obs. = 270)</th>
<th>GEV (Obs. = 420)</th>
<th>Mann-Whitney U Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established contract rate</td>
<td>0.93 (0.26)</td>
<td>0.88 (0.32)</td>
<td>2.08 (p=0.04)</td>
</tr>
<tr>
<td>Minimum acceptable wage</td>
<td>35.11 (11.82)</td>
<td>34.14 (10.96)</td>
<td>1.25 (p=0.21)</td>
</tr>
<tr>
<td>Worker’s effort</td>
<td>0.29 (0.24)</td>
<td>0.23 (0.25)</td>
<td>4.14 (p=0.00)</td>
</tr>
<tr>
<td>Firm’s offer</td>
<td>52.2 (14.60)</td>
<td>50.4 (18.18)</td>
<td>1.53 (p=0.13)</td>
</tr>
<tr>
<td>Worker’s payoff</td>
<td>284.9 (139.8)</td>
<td>275.2 (176.7)</td>
<td>0.48 (p=0.63)</td>
</tr>
<tr>
<td>Firm’s payoff</td>
<td>159.1 (123.0)</td>
<td>119.7 (109.2)</td>
<td>4.16 (p=0.00)</td>
</tr>
<tr>
<td>Total welfare</td>
<td>444.0 (204.8)</td>
<td>395.0 (230.3)</td>
<td>2.87 (p=0.00)</td>
</tr>
</tbody>
</table>

Note: standard deviations are in parentheses.

4. Concluding remarks

We examine the impacts of workers’ wage claims on the principal-agent relationship between firms and workers with hidden action through a laboratory experiment by using a gift exchange game in which the worker makes a payoff-irrelevant wage request before the firm makes a wage offer. We find that the worker’s voice reduces workers’ reciprocal incentives regardless of the wage levels offered by the firm, consequently lowering the established contract rate, the workers’ effort in the contracted pairs, and total welfare.

This study provides some implications for the effectiveness of the voice system, including grievance procedures and suggestion boxes, which have been controversial in management science. Freeman and Medoff (1984) argued that it made good sense for both employers and employees to have a voice mechanism based on the exit voice model (Hirschman, 1970). On the contrary, some field research on the grievance activities of employees has found that grievance filers have lower promotion rates, lower attendance rates, lower performance ratings, and higher turnover rates than nonfilers after grievance settlement (e.g., Lewin 1987). These findings imply that employees are punished for filing grievances to some extent. Further, the experimental study by Olson-Buchanon (1996) showed that grievance filers have lower objective job performance than nonfilers even though they are involved in the same pay-related disputes. However, they could not conclude that the low performance of employees was due to the presence of grievance systems since filing the grievance was at subjects’ discretion (i.e., grievance filing was not manipulated in their experiment). The results of the pres-
Different study support their experimental results since unlike their study, the workers in our experiment had to request their wage. Therefore, voicing wage claims directly reduces the performance of workers by changing their preferences for reciprocity.

References