

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

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Abstract

We examined how wage claims impact the principal–agent relationship between firms and workers with hidden action using laboratory experiments on a gift exchange game in which workers made payoff-irrelevant requests concerning their wage before the firm made a wage offer. We compared the experimental results of this game to those of a gift exchange game without wage claims and found that the wage claim detracted reciprocity regardless of the wage levels offered by the firm, resulting in shrinking economic surplus in their labor contracts.

JEL Classification: C92, J3, J42

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1. Introduction

Workers' requests for wage hikes or contract wages (the “worker’s voice”) is now common in the workplace due to changes in labor–management relations over the last few decades, such as frequent job shifts (Neale and Bazerman 1991, p. 2), the decentralization of wage bargaining, declining union densities (see, e.g., Dahl, Maire, and Munch 2013), and the increasing use of voice (or grievance) systems for employees in nonunion workplaces (see, e.g., Feuille and Delaney 1992).

This paper examines how the worker’s voice influences the reciprocal relationships between workers and managers. Labor relations can be characterized as a “gift exchange” between those who may consider social norms such as fairness and reciprocity (Akerlof 1982; Akerlof and

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Yellen 1990). A series of experiments on a gift exchange game (e.g., Fehr, Kirchsteiger, and Riedl 1993; Fehr, Kirchler, Weichbold, and Gächter 1998; Fehr and Falk 1999; Brown, Falk, and Fehr 2004) have qualitatively indicated the presence of a reciprocity that induces workers to expend costly efforts in response to a firm’s “generous” fixed-wage offer. In most of these studies, however, 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. This paper uses a laboratory experiment to investigate whether firms comply with workers’ claims, whether workers refuse contracts or shirk after accepting their contract when firms fail to comply, and how the worker’s voice affects economic efficiency.

2. Experimental design and procedure

2.1. Experimental design

Our experiment was 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 *token* (experimental currency units). If the worker accepts the wage offer, the worker chooses effort level e from 0.1 to 1, with increments of 0.1. In this case, the payoff functions of the firm and the worker in terms of the *token* are given by, respectively

$$\begin{aligned}\pi &= (120 - w) \times e \times 10, \\ u &= (w - c(e) - 20) \times 10,\end{aligned}$$

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

Table 1. Effort levels and costs

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

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 firm’s and worker’s payoffs in a payoff matrix. The payoff matrix is not a strategic form of the game but 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; 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 $v \in \{21, 36, 51, 66, 81, 96\}$

that he is willing to be received. The worker’s voice is irrelevant to the payoff: it is just “cheap talk.” We adopted 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 tells the firm of his voice in GEV), the worker decides the reservation wage $\underline{w} \in \{21, 36, 51, 66, 81, 96\}$ and his effort levels to every $w \geq \underline{w}$. If the actual wage offer is lower than \underline{w} , the offer is automatically rejected. Otherwise, it is accepted and the payoffs of the firm and the worker are automatically calculated by the actual offer w and the worker’s effort level e according to w .

2.3. Experimental procedure

We conducted two experimental sessions for GE and three for GEV between December 2013 and May 2014 at Takasaki City University of Economic and Chuo University, Japan. Details of each session are presented in Table 2. We recruited subjects using an electronic mailing list, posters, and fliers. The 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. A 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 GE, and 84 subjects participated in GEV. For all sessions, we used the z-tree software package provided by Fischbacher (2007).

Table 2. Experimental sessions

Session	1	2	3	4	5
Date	2013.12.12	2013.12.12	2014.04.24	2014.05.09	2014.05.09
Treatment	GE	GEV	GEV	GE	GEV
Subject pool	TCUE	TCUE	TCUE	CU	CU
The number of subjects	30	30	30	24	24
Participation fee	¥500	¥500	¥500	¥800	¥800

Note: “TCUE” refers to Takasaki City University of Economic and “CU” to Chuo University.

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, the subjects were randomly assigned their roles, firms, or workers. After the assignment, workers (firms) were seated randomly in front of the computer terminal in the front (back) of the laboratory. Each desk had a calculator and an envelope containing all the experimental materials, including the instructions, a recording 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, the subjects were

instructed to solve the practice problems in order to concrete their understanding of the experiment 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).

The subjects' reward was the fixed participation reward plus the variable token earned in the experiment. One token was converted into 1 yen, and the reward was privately 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.

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 paper. The first row in Table 3 indicates that the rates were 93 and 88 percent under the GE and GEV, respectively. This difference is found to be significant by the Mann–Whitney U test. These results contrast remarkably with those of previous studies, which found that the worker's voice enhances the establishment of reciprocal contracts between workers and managers. The second row shows the means of workers' efforts using observations concerning which contracts were established. The number of observations thus drops to 621 (251 and 370 in GE and GEV, respectively). Even when focusing on subjects with established contracts, the difference in worker's effort between GE and GEV was significant at the 1 percent level. Contrariwise, the firm's offer did not differ among the treatments. These results imply that the worker's voice may not influence the firm's behavior but the worker's.

The fourth, fifth, and sixth rows show the means of the worker, firm, and total payoffs, respectively. The test does not show the significant difference of workers' payoffs between GE and GEV, whereas the GEV's firm and total payoffs are significantly less than those of the GE. These comparisons imply that the worker's voice reduced total welfare, particularly reducing the firm's payoff via the decreased worker's effort.

Table 3. Mean comparisons of experimental outcomes between GE and GEV

	GE (Obs. = 270)		GEV (Obs. = 420)		Mann-Whitney U Test	
Established contract rate	0.93	(0.26)	0.88	(0.32)	2.71	(p=0.04)
Worker's effort*	0.29	(0.24)	0.23	(0.23)	4.14	(p=0.00)
Firm's offer	52.2	(14.60)	50.4	(18.18)	1.53	(p=0.13)
Worker's payoff	284.9	(139.8)	275.2	(14.82)	0.47	(p=0.37)
Firm's payoff	159.1	(123.0)	119.7	(10.96)	4.16	(p=0.00)
Total welfare	444.0	(204.8)	395.0	(18.18)	2.87	(p=0.00)

What factors caused these changes in outcome? We hypothesize that the worker's strategy (preference) might mediate between the voice and outcomes: the voice might negatively influence the worker's preference and in turn produce changes in outcome. To examine this hypothesis, we use the workers' stated preference data obtained from the strategy method described above. We display the preferences in Figure 1, the x and y axes representing wage offer and effort, respectively. At every wage offer level, the magnitude of the effort under GE is larger than that under GEV, suggesting that GEV may lessen the workers' reciprocal preference distributions. When regressing the wage offers (w) on the efforts (e) by treatment, the estimated linear relations are found to be $e = 0.0061w - 0.1054$ and $e = 0.0078w - 0.1377$ for GEV and GE, respectively. The coefficients of the wages are statistically different from each other at 1 percent significance level. Therefore, our hypothesis is statistically supported.

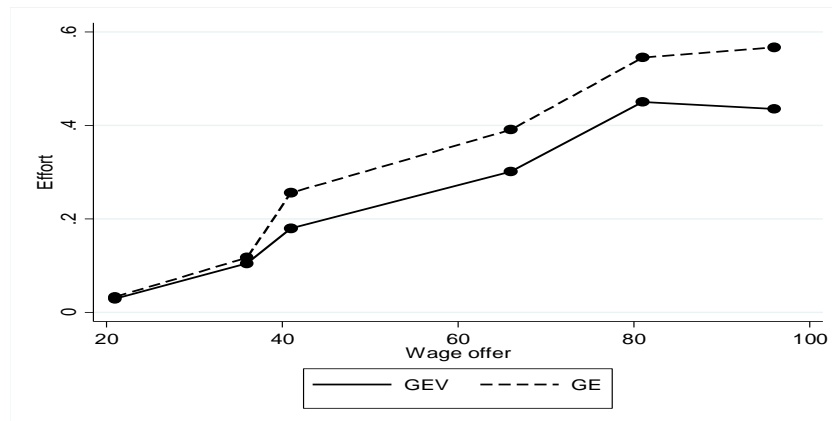


Figure 1. Workers' stated average relationship between wage offer and effort

Note: Workers do not need to state an effort level less than 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 ($=6 \times 10$ rounds \times (15 subjects \times 3 sessions + 12 subjects \times 2 sessions)).

4. Concluding remarks

We examine the impacts of workers' wage claims on the principal–agent relationships between firms and workers with hidden action through a laboratory experiment 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.

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