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# Wage negotiations and strategic responses to transparency\*

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## Abstract

This paper investigates how negotiations between employers and employees respond to exogenous and endogenous wage transparency. In a treatment with exogenous wage transparency, employers' offers increase significantly compared to the case when offers are private information. Moreover, the share of equal wage offers becomes larger.

Employers and employees rarely induce transparency themselves. In a treatment where employees could enforce transparency, average wage offers are significantly lower than in the other treatments. Thus, employees forego potential wage increases by staying ignorant about co-workers' offers. Taken together, these findings have important implications for recent policies aimed at increasing wage transparency.

**Key Words:** Wage transparency, wage negotiations, real-effort, gift exchange, experiment

**JEL Classification:** D91, J31, M52

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## 1. *Introduction*

A crucial question both from a policy and an employer perspective is how much information about the wage structure a company should provide to its employees. In many firms, there is a norm of not discussing salaries with colleagues, and sometimes employers explicitly discourage their employees from openly communicating what they earn. For instance, in a survey conducted among employees in the United States in 2010, about half of the participants stated “that the discussion of wage and salary information is either discouraged or prohibited and/or could lead to punishment” (Hayes and Hartmann 2011, p.70). On the other end of the spectrum, there are examples for companies (often small technology firms, but also the large supermarket chain Whole Foods) in which the entire wage profile has been made public by the management (Griswold 2014, Dishman 2015).

Enabling employees to assess their relative wage positions within organizations is at the heart of the current policy debate about discriminatory remuneration practices in many countries. Several federal states in the United States (the first being California and Michigan) have established laws against wage secrecy that, for example, prohibit retaliatory actions by employers if employees discuss and compare wages.<sup>1</sup> The European Commission explicitly recommends the EU member states to implement policies targeted at higher wage transparency, aiming at improving the bargaining position of female workers and mitigating gender-based wage discrimination (European Commission 2014). Recent legal changes in European countries reflect the goal to induce higher wage transparency. For example, large public and private organizations in the UK are required to publish information about gender differences concerning various aspects of their remuneration practices since 2017.<sup>2</sup> Several European countries (Finland, Ireland and Norway) have installed laws that in principle give employees the right to receive information about the salary of their colleagues (Veldman 2017). Most recently, from the

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<sup>1</sup> An overview about the federal states and the implemented regulations is provided by the Women’s Bureau of the United States Department of Labor ([https://www.dol.gov/wb/resources/WB\\_PaySecrecy-June16-F-508.pdf](https://www.dol.gov/wb/resources/WB_PaySecrecy-June16-F-508.pdf), assessed on 19 February 2018).

<sup>2</sup> This is due to ‘The Equality Act 2010 (Gender Pay Gap Information) Regulations 2017’ and ‘The Equality Act 2010 (Specific Duties and Public Authorities) Regulations 2017’.

beginning of 2018 on, a new law for wage transparency in Germany entitles employees of large organizations to receive information about how they stand relatively to other employees in the same function.<sup>3</sup>

Existing research in economics does not provide clear recommendations about what the desirable degree of wage transparency is. An obvious advantage of transparent wage regimes is that discriminatory practices become easier to detect which may help to reduce the severity of discrimination in the first place. Transparent information about wages may also have a positive impact on employee satisfaction and motivation, because wage secrecy may create distrust within the organization (Colella et al. 2007). Furthermore, transparent wage inequality may increase job satisfaction because high wages of others may be interpreted as signals for own future earnings (Clark et al. 2009).

It is unclear, however, whether the benefits of wage transparency are larger than the potential harm: There is ample laboratory and field evidence that unequal wage profiles, if made transparent, trigger social comparisons among employees that may destroy work motivation and increase the likelihood of leaving the company (for example, Greiner et al. 2011, Card et al. 2012, Cohn et al. 2014, Bracha et al. 2015, Ockenfels et al. 2015 and the references cited therein; Bracha 2017 summarizes recent findings on the impact of relative wage comparisons). These negative effects are found mainly among those employees who are relatively worse off. In a recent field experiment, Breda et al. (forthcoming) find that in addition to detrimental effects of disadvantageous wage inequality for performance and workplace attendance, unjustified pay disparity also leads to lower social cohesion among workers. Moreover, Cullen and Perez-Truglia (2018) provide evidence from a field experiment that detrimental effects of relative wage comparisons on effort and performance can be found when employees compare themselves with other employees of the same position. At the same time, relative wage comparisons on a vertical level (with managers) even have a positive effect on the outcome measures.

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<sup>3</sup> The German “Gesetz zur Förderung der Transparenz von Entgeltstrukturen” has become effective in July 2017.

The existing studies in this area have not focused on the strategic use of wage comparison information. Yet, in the light of the recent legal changes that enable higher wage transparency, the choices of companies to provide and the choices of employees to obtain information on relative wage positions might critically change the interactions between employers and employees in labor relationships. As employers and employees may differ in their strategic incentives to implement wage transparency, the distinction between exogenously induced and endogenously chosen transparency might be decisive for the impact of relative wage information. The present study investigates if and how and the source of transparency affects negotiations, the resulting wage profiles and performance. As employers and employees negotiate repeatedly with each other in the present setting, the impact of wage transparency can be tested from a dynamic perspective.

The present setting models the interaction between one employer and two employees: After sequentially negotiating with each employee, the employer sends wage offers to the two employees who, upon accepting the offers, perform a working task. As participants are rematched in every period, the interaction between employer and employee has the character of gift exchange: Higher performance in the task yields higher revenues for the employer but, due to the fact that payments are not contingent on performance and the employer has no sanctioning opportunities, the prediction for selfish employees is that they will not exert effort at all. After several rounds in which employees are only informed about their own wage offers, information about co-workers' wage offers is introduced in altogether three treatments. One treatment exogenously introduces full wage transparency whereas the other two treatments leave the decision to make the wage offers transparent either to employees or to employers.

Whereas most previous work has concentrated on establishing the importance of relative wage comparisons (please see the discussion above), only very few studies have considered the dynamic effects of wage transparency so far: In a field data sample of chief administrative officers of Californian cities, Mas (2017) finds that as a response to a change in legislation requiring to make the wages of these top employees public, transparency led to both wage cuts and higher wage compression, in line with a public aversion against high compensation. In a recent study, Cullen and Pakzad-Hurson (2018)

focus on the equilibrium effects of wage transparency. In their setting, a firm dynamically negotiates with multiple workers whose productivities are known only to the firm. Here, wage transparency leads to decreasing and more compressed wages. One reason for this result is that the firm has an incentive to lower its maximum accepted wage in anticipation of workers renegotiating after learning that they receive less than employed workers.<sup>4</sup> Moreover, given that transparency improves the bargaining position of the firm in this framework, the firm prefers to implement full wage transparency. The predictions of the model are tested and confirmed with data from an online platform and a field experiment.

The setting of this study differs in several ways from Cullen's and Pakzad-Hurson's framework, changing the expected behavioral responses to wage transparency by employers and employees. The present experiment focuses on labor relationships in which both parties have non-negligible bargaining power. Whereas the bargaining power of employers stems from the fact that they can make a take-it-or-leave-it offer, employees have an information advantage as their work productivity is private knowledge and employers cannot observe it prior to making the offer. Moreover, as wage offers cannot be conditioned on the produced output in the present study, there are no material incentives to perform well, emphasizing the importance of positive reciprocal reactions for the functioning of the employer-employee relationship.

As negotiation in the present setting is implemented as free-form bargaining between employers and workers, the study is also related to experimental research on the role of social comparisons for bargaining. Ho and Su (2009) study theoretically and experimentally how offers to peers affect the acceptance rates in sequential ultimatum games. They find that the second responders' beliefs about the offers to first responders significantly influence the probability to accept their own offers. Moreover, proposers seem to strategically exploit the uncertainty of the responders. At the same time, some studies have investigated the role of communication for the interaction between employers and workers. Previous experimental studies have demonstrated that specific

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<sup>4</sup> In addition, anticipation of later renegotiation also lowers initial bids among workers under transparency.

communication strategies may positively influence cooperation and coordination in labor settings (see for example, Brandts and Cooper 2007, Cooper and Lightle 2013, Brandts et al. 2015, Bolton and Werner 2016). Finally, Agranov and Tergiman (2014), Baranski and Kagel (2015) and Agranov and Tergiman (forthcoming) provide evidence from multi-person bargaining games that both the resulting allocations and the strategic choice of communication patterns are sensitive to the institutional environment (in this case the implemented decision rule, either the majority rule or the unanimity rule).

I find that behavioral responses to (potential) wage transparency are significantly affected by the source of transparency. The share of equal wage profiles becomes significantly larger after the introduction of exogenous full transparency. Contrary to previous studies on the dynamic impacts of wage transparency, offers increase significantly compared to the case of private wage information in the treatment with exogenously induced wage transparency. If employers would foresee these patterns, they would thus have little incentives to make wage profiles known. Indeed, the data shows that employers rarely implement wage transparency themselves. Moreover, when employees can enforce wage transparency, they do so only in a small share of the cases so that wage offers generally remain private information also here. In this treatment, the resulting wage offers are significantly lower than in the other treatments, and employees forego potential wage increases by staying ignorant. Finally, employers generally pay substantial extra wages, and, as employees reciprocate higher wages with higher performance, output patterns across treatments follow the dynamics of wage offers.

The remainder of the paper is as follows: Section 2 describes the experimental design and hypotheses. Section 3 focuses on the experimental results, and Section 4 discusses the findings and concludes.

## 2. *Experimental design and hypotheses*

The experimental decision situation models the wage negotiation process between an employer and two employees. Prior to the start of the experiment, subjects are randomly

assigned the role of employer and employee and keep this role for the entire experiment. In every round, one participant in the role of an employer and two participants in the role of employees are matched to each other. The experiment implements a strangers matching, ensuring that the same participants will never interact with each other in two consecutive rounds.

At the beginning of each round, a worker automatically receives a base payment of 150 experimental currency units (ECU). In addition, the employer is assigned a budget of 150 ECU for each employee that she can pay as an extra wage.<sup>5</sup> The total wage for the round is determined as follows: At the beginning of each round, the employer negotiates with each worker about the extra wage (0 to 150 ECU) that the latter will receive for the task on top of the base payment. This negotiation phase is implemented as a free-form chat communication that lasts for 60 seconds. The employer negotiates separately with each worker, and the communication between employer and workers cannot be observed by the other worker.<sup>6</sup> Which of the two workers negotiates first and second is determined randomly in each round.

After the negotiation phase, the employer makes a wage offer to each employee that has a take-it-or-leave-it character: If an employee accepts the wage offer, she works on a real-effort task in the next step. The experimental task consists of counting the numbers of “7”-digits in randomly generated blocks of digits.<sup>7</sup> Performance in the task generates revenues of 25 ECU per correctly counted block for the employer. If the worker rejects the offer, she is inactive in the particular round and receives only the base payment. In this case, the employer keeps the respective part of the budget that was offered to the employee as the extra wage. Hence, the experiment enables employees to punish offers perceived as unfair both on the intensive margin (accepting the offer and providing little

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<sup>5</sup> The unconditional base payment is chosen to ensure adequate average payments for participants in the role of employees in the experiment.

<sup>6</sup> Participants are explained that it is not allowed to reveal their identities during the chat. Also, it is forbidden to use offensive language or to insult other participants.

<sup>7</sup> Using this task has the advantage that it requires substantial concentration and effort, but at the same time no previous knowledge is necessary. Prior to the start of the main experiment, both employers and employees work on several trial blocks to become familiar with the task.

or no effort) and the extensive margin (refusing to work at all). If the worker accepts the extra wage and works on the task, she is informed about her own task performance after the round. Also, employers learn about the performance of both workers before they are matched to new interaction partners for the next round.

The experiment is divided into two parts, each consisting of four rounds of the decision situation described above. In the first part (rounds 1 to 4), wage offers of employers always remain private information of the particular worker (*PRIV*). Therefore, wage offers to co-workers cannot influence the decisions to accept one's own offer or to exert effort in the working task. However, in the second part of the experiment (rounds 5 to 8), variations in the availability of information about peer offers are introduced. This change to (partial or full) wage transparency resembles the recent shift towards more transparent wage profiles starting from the predominant norm of wage secrecy.

Responses to wage transparency are investigated in a within-subjects design with altogether three experimental treatments: Treatment *TR* exogenously induces full wage transparency in the second part of the experiment. After both negotiations are over, workers are informed about their own offer and the offer to the co-worker and can then decide if they accept or reject their offers. The other two treatments investigate the strategic choice of wage transparency both from the employer's and the employees' perspective. Treatment *TR\_EMP* refers to recently implemented laws that enable employees to learn about wages of their colleagues. In this treatment each worker can, prior to the negotiation, decide on whether or not she wants to be informed about the wage offer to her co-worker after the negotiation.<sup>8</sup> Information about the co-worker's offer is associated with small costs (10 ECU), reflecting the transaction costs that may arise for an employee to obtain wage comparison information (for example, by approaching interacting with the workers' council of her company). Finally, in treatment *TR\_COMP*, the employer can, prior to the negotiations with the two workers, decide to make the wage profile transparent. If she chooses to do so, employees learn both about

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<sup>8</sup> If one employee asks for information about his co-worker and the other does not, only the first employee learns about the peer wage. This is related to the feature of the German law for wage transparency that an employee has to actively seek information about the payments of others in order to receive this information.

their own offer and the offer to the co-employee after the negotiation. Also here, transaction costs of 10 ECU are associated with the decision to make offers transparent, in this case on the side of the employer (referring, for example, to administrative costs that firms have to bear when collecting and producing information about the wage structure). If the decision-makers in *TR\_EMP* and *TR\_COMP* opt against transparency, wage offers remain private information. Importantly, employees and employers in all treatments are notified about which information about wage offers will be eventually provided to the employees prior to the start of the first negotiation in a round. Hence, anticipation of the (non-)transparency of the later offers already affect negotiations in a given round.

An important feature of the present experimental design is its gift exchange character. To ensure that wage offers cannot be used as incentive device in the repeated setting (for example, by promising higher wage in future rounds conditional on high performance in a given round), employers and employees are rematched after each round. Moreover, all communication during the negotiation process (such as promises or references to a worker's ability) has the character of cheap talk. Since employees receive the extra wages irrespective of performance, they have no incentive to exert any effort, implying a task output of zero in every round. Foreseeing this, the employer will always offer an extra wage of 0 ECU which makes the employee indifferent between accepting and rejecting the offer. However, there is substantial evidence for the existence of positive reciprocity in laboratory settings: Higher than minimum wages are typically reciprocated by employees with higher efforts (Fehr et al. 1993; Charness and Kuhn 2011 provide an extensive survey of experimental literature on gift exchange). Moreover, the laboratory evidence that communication may promote trust and trustworthiness (see, for example, Charness and Dufwenberg 2006, Cooper and Lightle 2013, Bolton and Werner 2016) would suggest that higher than minimum levels for wages and performance can be achieved in the present setting where employers and employees communicate in order to agree on the wage for the task.

The main focus of this study is on the effect of transparency on wage profiles and the resulting performance of the employees. Concerning the effect of exogenously induced

transparency (*TR* versus *PRIV*), previous evidence for the strong negative responses to disadvantageous relative positions (see Section 1) would suggest that there will be less wage differentiation under transparency than under private information if employers foresee and try to avoid these negative responses (*Hypothesis 1*).<sup>9</sup>

Concerning absolute wage levels, the effect of transparency is not clear per se and depends, among other things, on the way the negotiation process is modelled (for example, on the distribution of bargaining power between employer and employee).<sup>10</sup> Whereas the employer can make a take-it-or-leave-it offer in the present setting, employees also have non-negligible bargaining power, and the decision situation leaves room for gift exchange between employer and employees. Hence, in line with findings from experimental redistribution and bargaining games (Bolton et al. 2016, Agranov and Tergiman forthcoming) that public information and communication may lead to higher proposals, the hypothesis is that absolute wage offers to employees will increase under transparency (*Hypothesis 2*).

The hypotheses concerning the effects of endogenous wage transparency directly follow from the first two hypotheses: If employees anticipate the strategic value of transparent wage information in order to enforce higher wages, they should choose to become informed about the co-workers' wage offers which would imply a high level of wage transparency (measured by a high share of transparent wage profiles) in *TR\_EMP* (*Hypothesis 3*). Conversely, if employers foresee the pressure to equalize wages on a higher absolute level under transparency, one would expect a generally low willingness to communicate wage levels and subsequently low wage transparency in *TR\_COMP* (*Hypothesis 4*).<sup>11</sup>

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<sup>9</sup> A concern for relative wages among employees can be explained by models of inequality aversion (Fehr and Schmidt 1999, Bolton and Ockenfels 2000). Wage compression may be the result of wage transparency in labor settings if employees care about their relative standing towards their colleagues. For instance, Ockenfels et al. (2015) assume that employers care for the utility of their employees and employees evaluate their payments relative to reference payments.

<sup>10</sup> Please see the discussion of the study by Cullen and Pakzad-Hurson (2018) in Section 1.

<sup>11</sup> If the choice of transparency is perceived as a costly signal for the employer's generosity among employees, making the wage profile known might trigger positive reciprocal responses. This mechanism would create incentives for the employer to actually induce wage transparency.

Altogether 9 experimental sessions were conducted in the Behavioral and Experimental Economics Laboratory (BEELab) at Maastricht University in May 2018. The experiment software was programmed with the software z-tree (Fischbacher 2007); participants were recruited with the online recruitment system ORSEE (Greiner 2015). Altogether 207 subjects participated in the experiment. During the sessions, matching groups of 9 participants each (3 employers and 6 employees) were formed who interacted with each other in the course of the experiment. Participants were not assigned numbers or other labels that allowed for an identification of a particular subject in later rounds of the experiment. In general, all three treatments were run in the same session. In sessions where this was not possible because less participants attended than were registered, two of the three treatments were conducted. All in all, as a result of the assignment of subjects to matching groups, I collected 8, 8 and 7 statistically independent observations for treatments *TR*, *TR\_EMP* and *TR\_COMP*, respectively.

On the day of a session, subjects arrived at the laboratory, were seated in private cubicles and received written instructions (see Appendix A2 for the instructions to all treatments). They had the possibility to ask questions concerning the decision situation which were privately answered by the experimenter. The sessions lasted for approximately 90 minutes; participants earned 17.78 Euro on average (standard deviation: 4.30 Euro). After the experiment was over, participants answered a short voluntary questionnaire about basic demographic characteristics (such as gender and field of studies). Before they left the laboratory, the experimenter privately paid subjects their accumulated earnings converted into Euro.<sup>12</sup>

### 3. Results

In the first step, I compare the willingness of workers to accept the offers by employers across treatments. Overall, workers rarely reject the employers' offers: Only in 8.5% of all cases in part 1 (7.8% in part 2), a wage offer is not accepted. Moreover, there are no

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<sup>12</sup> The conversion factor was 125 ECU = 1 Euro.

strong differences in rejection rates across treatments, as Table 1 indicates.<sup>13</sup> The generally low rejection rates indicate that employees in the present setting seem to punish employers for unfair offers mainly on the intensive margin by accepting the particular offer and providing low or zero effort in the working task.

Table 1. Share of offers rejected by the employee in %

Treatment	Part 1	Part 2
<i>TR</i>	8.9	7.3
<i>TR_EMP</i>	12.5	10.4
<i>TR_COMP</i>	3.6	5.4

Following the order of the hypotheses described in the previous section, the main analysis first focuses on the degree to which employers differentiate in wages between the two workers. The measure for differentiation is the share of equal offers per treatment and round. To link decisions of employers (wage offers) and the responses of workers (performance) more closely to each other, attention is generally restricted in the following to cases where workers accepted wage offers and worked on the task. However, conclusions are qualitatively similar if also the offers that were rejected by a worker are included.

As expected, treatments do not differ in the average shares of equal wage profiles accepted by both workers under private information about wage offers (part 1 of the experiment). Calculated for each experimental matching group, the average shares of equal offers account for 17.5%, 27.7% and 20.2% in *TR*, *TR\_EMP* and *TR\_COMP*, respectively.<sup>14</sup> However, the introduction of (possible) transparency leads to markedly different dynamics across treatments: In *TR*, the share of equal offer profiles increases by 21.8 percentage points to 39.3%, suggesting a tendency towards less wage differentiation in treatment *TR*. At the same time, the corresponding shares drop by 5.5 percentage

<sup>13</sup> Comparing average rejection rates calculated separately for each statistically independent matching group, I do not observe robust significant across-treatments differences. All two-sided Mann-Whitney U (MWU) tests yield p-values of  $p > 0.1$ ; the only exception is a significant difference between *TR\_EMP* and *TR\_COMP* in part 1,  $p = 0.03$ .

<sup>14</sup> Calculating the average share of equal wage offers per experimental matching group for the first part of the experiment and comparing these averages with two-sided Mann-Whitney U (MWU) tests yields no significant differences ( $p = 0.342$  for *TR* versus *TR\_EMP*,  $p = 0.907$  for *TR* versus *TR\_COMP*, and finally,  $p = 0.485$  for *TR\_EMP* versus *TR\_COMP*).

points in *TR\_EMP* (to 22.2%) and by 10.0 percentage points to only 10.2% in *TR\_COMP*.<sup>15</sup>

The different dynamics across treatments are corroborated by the results of random effects probit models reported in Table 2 that capture the individual heterogeneity of the employers. The dependent variable in these models is a dummy that is equal to one if an employer offered the same extra wage to the two workers in a given round, and zero otherwise. Model 1 analyses the impact of the introduction of transparency for all cases in which both offers were accepted by the workers. As independent variables I first include the three treatment dummies *TR*, *TR\_EMP* and *TR\_COMP*. Here and in the other parametric analyses referring to the entire 8 rounds of the experiment (see Table 4 below), these treatment dummies measure the changes in the dependent variables in part 2 of the experiment relative to part 1 in which the decision situation was identical in all three treatments. To control for the effect of the demographic backgrounds of the subjects and potential session effects, I additionally include a dummy variable equal to one if the participant was female, the age of the participant in years and dummy variables for the experimental sessions. Model 2 in Table 2 is based on all employer offers (including those profiles that were rejected by at least one worker).

As Table 2 shows, both specifications yield qualitatively the same results: Introducing full transparency about offers in *TR* is associated with a higher share of equal wage offers relative to the first part of the experiment, in line with Hypothesis 1. In case of *TR\_COMP*, the share of equal offers becomes significantly smaller in the second part. Moreover, the demographic variables do not have a significant impact in the models.

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<sup>15</sup> If I conduct two-sided Wilcoxon Matched-Pairs-Signed-Ranks (WMPSR) tests to compare the average shares of equal offers on the level of the matching groups, I observe a weakly significant increase in part 2 in *TR* ( $p = 0.069$ ) and no significant differences in *TR\_EMP* and *TR\_COMP* ( $p = 0.401$  and  $p = 0.203$ , respectively). Comparing the share of equal wage profiles across treatments for part 2, I observe a significant difference between *TR* and *TR\_COMP* ( $p = 0.031$ , two-sided MWU test). The other between treatments comparisons are not significant on conventional levels ( $p = 0.187$  and  $p = 0.101$ , two-sided MWU tests for *TR* versus *TR\_EMP* and *TR\_EMP* versus *TR\_COMP*).

Table 2. Equal offers per treatment – Random effects probit models

Model No.	1	2
Dependent Variable	Equal offers	Equal offers
<i>TR</i>	0.534*** [0.189]	0.400** [0.175]
<i>TR_EMP</i>	0.030 [0.204]	0.135 [0.182]
<i>TR_COMP</i>	-0.535** [0.244]	-0.444** [0.223]
Female	0.099 [0.185]	0.067 [0.175]
Age (years)	-0.003 [0.047]	-0.016 [0.045]
Observations	466	544
Sample	Both offers accepted	All offers
Controls for sessions	Yes	Yes

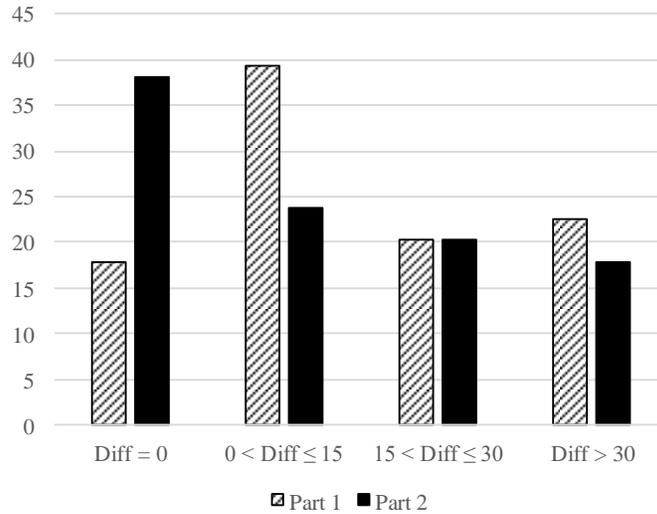
The models are random effects probit specifications with a dependent variable equal to one if the employer made the same offer to both employees in a given round. Controls include dummy variables for experimental sessions. \*\* and \*\*\* denominate significance on the 5%- and 1%-level, respectively. The treatment dummies *TR*, *TR\_EMP* and *TR\_COMP* refer to the second part of the experiment (rounds 5 to 8). The reference category in the models consists of observations from rounds 1 to 4 in which the decision situation is identical in all treatments.

A remaining question is how the introduction of full wage transparency in treatment *TR* affects the overall distribution of wage differences. Figure 1 shows the percentages of offer profiles by the employers that implement a given absolute difference between the offer to the first and the second employee in ECU before (part 1) and after the introduction of full transparency (part 2). Egalitarian profiles are displayed as a separate category in the figure.

As can be seen from the figure, introducing wage transparency does not seem to shift the entire distribution of wage differences in treatment *TR* towards more egalitarian offers. Instead, the observed increase in the share of equal offer profiles in part 2 is accompanied by a shift away from profiles with a low degree of differentiation (of less than 15 ECU). This indicates that the exogenously induced full wage transparency affects predominantly

the cases with a relatively low degree of ex-ante differentiation when wage offers are private information.<sup>16</sup>

Figure 1. Share of differences in offers (*Diff*) per ECU interval in %, Treatment *TR*



The figure displays the percentages of offers implementing a given wage difference in ECU (*Diff*) between the two employees in treatment *TR* before (part 1) and after the introduction of full transparency (part 2). The figure includes only offers profiles that were accepted by both employees. Dashed (solid) bars indicate the percentage shares of offer profiles within the respective ECU interval in part 1 (part 2) of the experiment.

To test Hypothesis 2 in the next step, I compare the sizes of the offers to the workers across treatments. Table 3 lists average accepted wage offers for each of the three treatments, separately for the first and the second half of the experiment.

Table 3. Average accepted wage offers in ECU

Treatment	Part 1	Part 2
<i>TR</i>	88.80	105.96
<i>TR_EMP</i>	81.83	84.89
<i>TR_COMP</i>	83.57	99.67

As Table 3 shows, the level of wage offers accepted by the employees are similar across treatments for part 1 and range roughly between 80 and 90 ECU.<sup>17</sup> Hence, employers

<sup>16</sup> Figure A1 in the Appendix shows the corresponding shares of offer profiles with a given level of differentiation in the treatments *TR\_EMP* and *TR\_COMP*. In both treatments, I observe a tendency away from equal offer profiles towards more differentiation in part 2.

offer on average substantially more than the minimum extra wage. For the second part, I observe a significant further increase in wage offers for treatment *TR* which corroborates Hypothesis 2: When all workers are informed about the co-workers' offers, average accepted wage offers increase significantly by more than 19% to 105.59 ECU ( $p = 0.012$ , two-sided WMPSR test). On the contrary, wage offers in *TR\_EMP* increase only slightly and insignificantly (+4%,  $p = 0.401$ , two-sided WMPSR test). Finally, average offers in *TR\_COMP* also show a significant upwards trend in part 2 and are on average more than 19% higher than in the first part ( $p = 0.018$ , two-sided WMPSR test).<sup>18</sup>

These results are confirmed in parametric analyses: Table 4 reports linear regression models with random effects on the level of an employer and the average offer per period and employer as the dependent variable. Similar to the analyses in Table 2, Model 1 is calculated for the cases in which both offers of an employer were accepted by the employees whereas Model 2 includes all offers.

Both models lead to the same conclusions: As shown by the significant and positive coefficients of the treatment dummies *TR* and *TR\_COMP*, average offers increase significantly during part 2 in these treatments. At the same time, wage offers stay constant in *TR\_EMP*.

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<sup>17</sup> I do not find significant differences between treatments for part 1 in non-parametric MWU tests comparing matching group averages (p-values for all pairwise treatments exceed  $p = 0.1$ ).

<sup>18</sup> In part 2, wage offers are significantly lower in *TR\_EMP* than in the other treatments ( $p = 0.002$ , two-sided MWU test, for the comparison with *TR*, and  $p = 0.011$ , two-sided MWU test, for the comparison with *TR\_COMP*). Wage offers do not differ between *TR* and *TR\_COMP* ( $p = 0.203$ ).

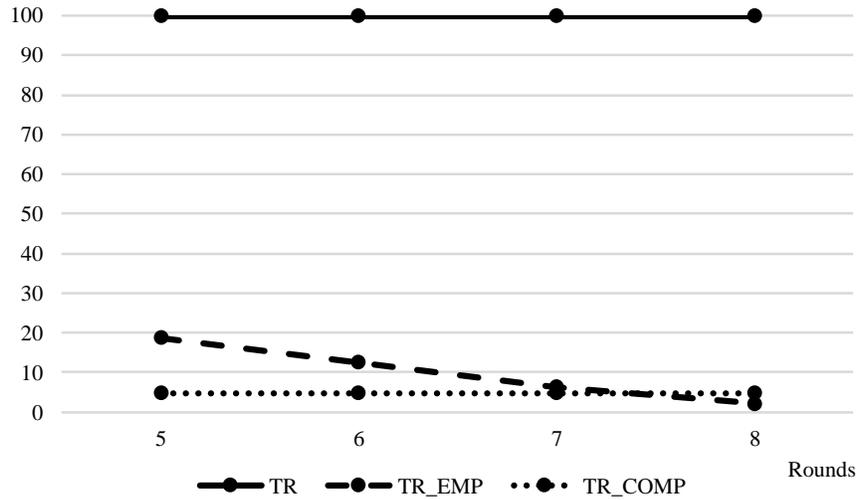
Table 4. Average wage offers by employers in ECU – Random effects models

Model No.	1	2
Dependent Variable	Average wage offer	Average wage offer
<i>TR</i>	17.082*** [2.546]	17.296*** [3.025]
<i>TR_EMP</i>	2.942 [2.664]	2.497 [3.031]
<i>TR_COMP</i>	14.168*** [2.725]	15.036*** [3.308]
Female	-0.380 [4.254]	-1.663 [5.220]
Age (years)	1.395 [1.123]	2.247 [1.380]
Constant	43.260* [24.547]	20.173 [30.063]
Observations	466	544
Sample	Both offers accepted	All offers
Controls for sessions	Yes	Yes

The models are random effects specifications with the average offer of an employer in ECU in a given round as the dependent variable. Controls include dummy variables for experimental sessions. \* and \*\*\* denote significance on the 10%- and 1%-level, respectively. The treatment dummies *TR*, *TR\_EMP* and *TR\_COMP* refer to the second part of the experiment (rounds 5 to 8). The reference category in the models consists of observations from rounds 1 to 4 in which the decision situation is identical in all treatments.

Next, I turn to the strategic responses of employers and workers concerning the possibility to inform or become informed about offers to co-workers. Figure 2 plots the average transparency rates for each of the treatments in part 2 (rounds 5 to 8). The transparency rate refers to the percentage share of the negotiations in which a worker was informed about the offer to her co-worker prior to accepting his/her offer at all negotiations in part 2.

Figure 2. Transparency rates in part 2 (in %)



The solid line in Figure 2 refers to treatment *TR* in which the transparency rate is by definition 100%; the dashed line shows the share of transparent offer profiles in treatment *TR\_EMP* in which employees can initiate transparency. As the figure shows, the achieved transparency rate is very low in this treatment. Calculated over all rounds of part 2, workers choose to be informed about the offers to their co-workers only in 9.9% of all cases. The corresponding transparency rate in *TR\_COMP* is with only 4.8% even smaller.<sup>19</sup> Hence, in both conditions with endogenous wage transparency the large majority of wage offers remain private information. Overall, the evidence thus supports Hypothesis 4 that wage transparency remains low when companies can provide wage information. Yet the results clearly contradict Hypothesis 3 that high wage transparency will emerge when workers are enabled to obtain information about their relative wage positions.

Concerning effort choices of the experimental employees, the dynamic patterns roughly mirror the development of absolute wage offers in parts 1 and 2. Table 5 lists the average output per experimental worker and round separately for the two parts of the experiment.

<sup>19</sup> In line with the lower incentives to make offers transparent in *TR\_COMP*, the average shares of transparent offers (calculated over independent matching groups) are weakly significantly smaller here than in *TR\_EMP* ( $p = 0.094$ , two-sided MWU).

Table 5. Average output in number of blocks per round

Treatments	Part 1	Part 2
<i>TR</i>	4.81	5.53
<i>TR_EMP</i>	4.74	4.80
<i>TR_COMP</i>	5.07	5.62

Whereas average output levels are comparable in the first part of the experiment,<sup>20</sup> effort dynamics differ substantially between the treatments: In *TR*, average output increases significantly by some 15% ( $p = 0.025$ , WMPSR test), and a similar pattern is observed in *TR\_COMP* (+11%,  $p = 0.018$ , WMPSR test). At the same time, output stays roughly constant in *TR\_EMP* (+1%,  $p = 0.674$ , WMPSR test). As the result of these patterns, output levels are significantly lower in *TR\_EMP* than in the other two treatments ( $p = 0.027$  and  $p = 0.037$ , two-sided MWU tests for the comparisons to *TR* and *TR\_COMP*). At the same time, the output levels do not differ between *TR* and *TR\_COMP* ( $p = 0.728$ , two-sided MWU test).

Linear models with random effects on the level of the workers are calculated to analyze the determinants of performance, accounting for individual heterogeneity. The dependent variable is the output in number of correctly solved blocks by the worker in a given round. As independent variables I include a measure for the worker’s general ability in the task (measured as the seconds required to complete the five trial blocks, with a maximum of 150 seconds if the employee did not finish all blocks), treatment dummies for *TR\_EMP* and *TR\_COMP* (in these models, *TR* serves as the reference category), the extra wage offered to the worker and, finally, the controls for demographics and experimental sessions that were also used in the previous analyses. Specifications 1 and 2 use the data from part 1 and part 2 of the experiment, respectively.

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<sup>20</sup> Comparing average output levels of the matching groups between the treatments does not yield significant differences in part 1 ( $p = 0.674$  for *TR* versus *TR\_EMP*,  $p = 0.772$  for *TR* versus *TR\_COMP*, and  $p = 0.488$  for *TR\_EMP* versus *TR\_COMP*).

Table 6. Determinants of individual output – Random effects models

Model No.	1	2
Dependent Variable	Output	Output
<i>TR_EMP</i>	0.106 [0.327]	0.243 [0.418]
<i>TR_COMP</i>	0.331 [0.342]	0.243 [0.430]
Wage offer	0.034*** [0.003]	0.045*** [0.004]
Task ability	-0.026*** [0.008]	-0.050*** [0.011]
Female	-0.024 [0.283]	0.572 [0.355]
Age (years)	0.057 [0.054]	-0.125* [0.071]
Constant	4.211** [1.765]	9.721*** [2.265]
Observations	505	509
Sample	Part 1	Part 2
Controls for sessions	Yes	Yes

The models are random effects specifications with the individual output in number of correct blocks in a given round as the dependent variable. Controls include dummy variables for experimental sessions. In both models, the reference category consists of workers in the *TR* treatment. Control variables include dummy variables for experimental sessions. \*, \*\* and \*\*\* denominate significance on the 10%-, 5%- and 1%-level, respectively. In periods 1 to 4 of the experiment (part 1), the decision situation is identical in all treatments.

In both specifications, the task ability variable has a significant negative effect, indicating that subjects who need less time to complete the trial task produce higher output in the main experiment. Furthermore, I find a highly significant positive effect of the wage offer on effort in both models, in line with the well-documented evidence from laboratory studies that workers reciprocate higher wages with higher effort in gift exchange settings. Importantly, controlling for the wage offered to a worker, there is no significant additional effect of the treatments. This seems to suggest that the significant performance

differences between the treatments in the second part can be mainly explained by the differences in wage offers by the employers.<sup>21</sup>

The hypotheses related to the responses of wage profiles to the introduction of transparency build on the idea that workers have social preferences and care about wages paid to co-workers. Therefore, in the final step of the analysis, I check whether wage comparisons per se play a role for worker's effort choices for the cases in which relative wage information is available. To do so, I calculate random effects regression models similar to those reported in Table 6 with the period output of an employee in part 2 as the dependent variable. The analysis is restricted to the cases where relative wage information was provided to employees. Besides the independent variables from the previous models, the wage offer to the co-worker is added to the model. Table 7 lists the results of the specifications.

Model 1 is restricted to observations from the *TR* treatment that induces full wage transparency. In addition to the effects of one's own wage offer and task ability that are similar to the previous analyses, the coefficient for the co-worker's offer is negative and marginally significant ( $p = 0.063$ ). This confirms that relative wage comparisons matter for work motivation in the present experimental setting: Controlling for one's own wage offer, performance drops with increasing offers to the co-worker, in line with aversion against disadvantageous inequality. I arrive at the same conclusion in Model 2 in which I additionally include the small number of observations from treatments *TR\_EMP* and *TR\_COMP* in which workers were informed about the offer to the co-worker prior to the working task. The coefficient is negative and marginally significant also in this specification ( $p = 0.064$ ). All in all, this analysis suggest that, once relative wage information is provided, it influences performance in the direction of previous evidence on the importance of relative comparisons at the workplace. At the same time, comparing sizes and significance levels between the coefficients for one's own offer and the co-

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<sup>21</sup> Concerning demographics, the coefficient of a subject's age in years is weakly significantly negative in Model 2, indicating a somewhat lower performance by older participants in the second part.

worker's offer in the models of Table 7, it seems that the impact of one's own offer is substantially larger for the employee's decision to exert effort in the present setting.

Table 7. Determinants of individual output in part 2 – Random effects models

Model No.	1	2
Dependent Variable	Output	Output
Wage offer	0.057*** [0.008]	0.056*** [0.007]
Co-worker's wage offer	-0.010* [0.005]	-0.010* [0.005]
Task ability	-0.057*** [0.019]	-0.052*** [0.016]
<i>TR_EMP</i>		0.457 [0.728]
<i>TR_COMP</i>		-0.407 [0.989]
Female	0.499 [0.594]	0.215 [0.484]
Age (years)	-0.303** [0.138]	-0.214* [0.111]
Constant	14.256*** [4.107]	12.254*** [3.290]
Observations	178	203
Sample	<i>TR</i> , part 2	All treatments, part 2
Controls for sessions	Yes	Yes

The models are random effects specifications with the individual output in number of correct blocks in a given round as the dependent variable. Controls include dummy variables for experimental sessions. In Model 2, the reference category consists of workers in the *TR* treatment. Control variables include dummy variables for experimental sessions. \*, \*\* and \*\*\* denominate significance on the 10%-, 5%- and 1%-level, respectively.

#### 4. Discussion and Conclusion

I have conducted an experimental study to investigate the role of exogenous and endogenous transparency on wage negotiations and performance. In line with the hypotheses, introducing full transparency leads to an upwards shift in wages and a higher share of equal wage offers. At the same time, behavior under endogenous transparency

differs from ex-ante expectations in several ways: First, workers in the experiment are very reluctant to enforce transparency about their co-workers' offers when they have the possibility to become informed. Yet, by staying ignorant, they forego potential wage increases: In the treatment with exogenous transparency, offers are on average more than 20 ECU higher. Hence, workers under endogenous transparency would still benefit from bearing the costs of transparency (10 ECU) in the experiment.

An open question is what the underlying mechanism is that drives the employees' tendency to stay ignorant, in particular because workers in principle seem to care about relative wages. One potential reason is that workers underestimate the benefits of wage transparency. If an employee does not anticipate the upwards shift in offers resulting from the fact that offers will later be communicated to both employees, she might be reluctant to pay the costs associated with obtaining this information. An alternative explanation could be related to information avoidance among employees. As Golman et al. (2017) describe in their survey, decision-makers may have the tendency to actively avoid information, even if the information is strategically relevant, as it is the case in the present setting for wage negotiations between employer and employee. In a recent study, Huck et al. (2018) provide evidence that information avoidance is relevant in labor settings. The authors let participants work under a piece rate that is randomly determined to be either high or low. In a treatment where subjects can decide whether or not to learn the realized piece rate immediately before or after the task, about a third of them choose to remain ex-ante ignorant. Some participants state that they avoid the information to remain motivated during the task when the piece rate is in fact low. A similar mechanism might also be at work in the present setting: Participants may choose not to be informed about the co-worker's offer because they want to avoid the demotivating effect of learning that they earn relatively less. The present setting cannot distinguish between the two potential mechanisms that may make experimental employees reluctant to acquire relative wage information. Yet, it would be interesting for both further research and for the design of policy measures aim at inducing higher wage transparency to disentangle the relative importance of these mechanisms for employee behavior.

Second, the very low level of wage transparency in the treatment where employers decide about the provision of relative wage information is in line with their incentives to keep wage profiles secret (which corresponds to the hypotheses). Yet, somewhat surprisingly, the lack of transparency in this treatment does not lead to inferior results for the workers: Despite the fact that almost all wage negotiations are conducted under private information also in *TR\_COMP*, average wage offers are significantly higher than in *TR\_EMP*. One potential explanation for the high average offers in *TR\_COMP* is that after learning that the employer has chosen not to inform about the offers to co-workers, some employees might become suspicious about being treated unfairly and bargain harder during the wage negotiation. Figure A2 in the Appendix provides some suggestive evidence for this conjecture. The figure displays the percentage shares of wage offers in different ECU intervals separately for each of the treatments. For the *TR\_EMP* treatment, the shares of offers in the different intervals do not change strongly from the first to the second part. In case of *TR\_COMP*, however, the percentage share of very high offers (> 120 ECU) increases strongly (from about 5% in part 1 to more than 20% in part 2) while the shares of small and medium offers decline. This observation is in line with the interpretation that some workers bargain more aggressively when the employer could have provided information about co-workers' offers but opted against it. At the same time, employers are not additionally punished for their unwillingness to share wage information as indicated by the performance levels that significantly exceed those in the *TR\_EMP* treatment.

In the present setting, exogenously introduced transparency affects wage profiles and performance despite the fact that employees get to know wage offers to co-employees only prior to accepting or rejecting their own offers and thus cannot use this specific information in the current negotiation. Hence, the anticipation that wage profiles will be communicated to employees is already sufficient to shift behavior. In this sense, the strategic reactions to wage transparency might be interpreted as a lower bound to what could be expected in field settings where the knowledge about the exact level of co-workers' wages might be directly utilized in wage negotiations.

A possible policy implication from the results is that providing employees the right to become informed about their relative wage position but at the same time leave it to their own initiative if they really obtain this information (as in the new German wage transparency act) might not lead to fundamental changes in wage negotiations and wage profiles relative to the status quo, at least as long as receiving information is associated with costs. Employees rarely obtain relative wage information, although the experimental design abstracts away indirect detrimental effects to wage inquiries such as reputational costs or negative career consequences which are often seen as important barriers that keep employees away from requesting relative wage information in practice. In fact, as a recent evaluation of the impact of the new transparency law in Germany suggests, only a very small share of the employees have actively contacted their company in order to seek relative wage information (Hagelüken and Öchsner 2018).

The tendency to remain ignorant in the present experiment and the recent experience from the German labor market stands in contrast to other findings from the field that many employees in principle want to know about their relative standing: Card et al. (2012) show in a large field experiment that, when being informed about the existence of a website with readily available relative wage information for university employees, a substantial part of the employees make use of the possibility to become informed. Cullen and Perez-Truglia (2018) find strong heterogeneity among the employees from a large bank in their willingness to pay in order to receive information about peer and manager salaries. Taken together, one implication of these results and my study would be that in order to increase wage transparency, policy-makers should aim at reducing the required transaction costs for employees to gather relative wage information as much as possible.

Another question that has to be evaluated from a policy perspective is about the potential indirect costs of increased wage transparency. In the present experimental setting, full wage transparency leads to a significant increase in average wage offers. This wage increase shifts resources away from the employer to the employee. Importantly, due to the strangers matching in the present experiment, employees are homogenous from the perspective of the firm, as productivities are not observable. Therefore, wage offers (and the observed wage increases under full transparency) can result only from the bargaining

strategies applied by the interaction partners. Transferred to company environments, this would suggest that the introduction of wage transparency may not only reduce discriminatory differences in wages but may also affect the negotiation process that determines wages. Therefore, to assess the overall effects of more transparent wage structures, the impact of transparency on wage negotiations per se and the resulting wage structures from a dynamic perspective should be taken into account.

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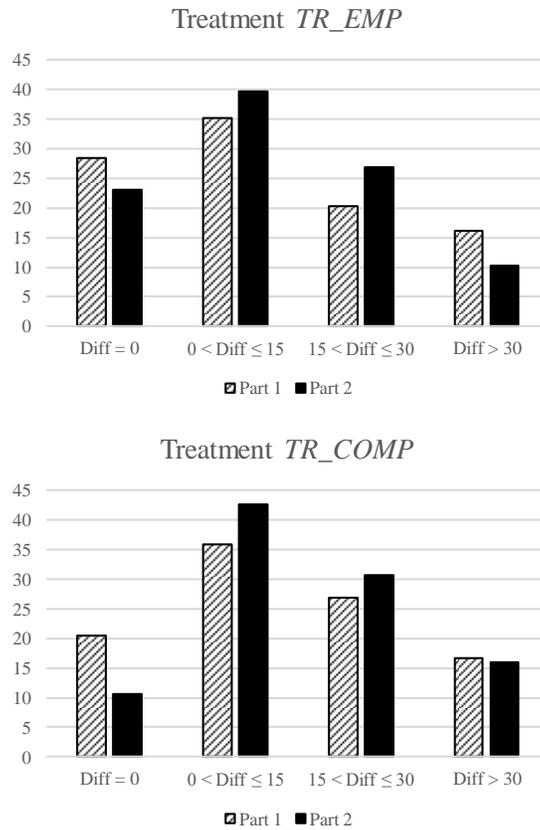
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*Appendix for online publication only.*

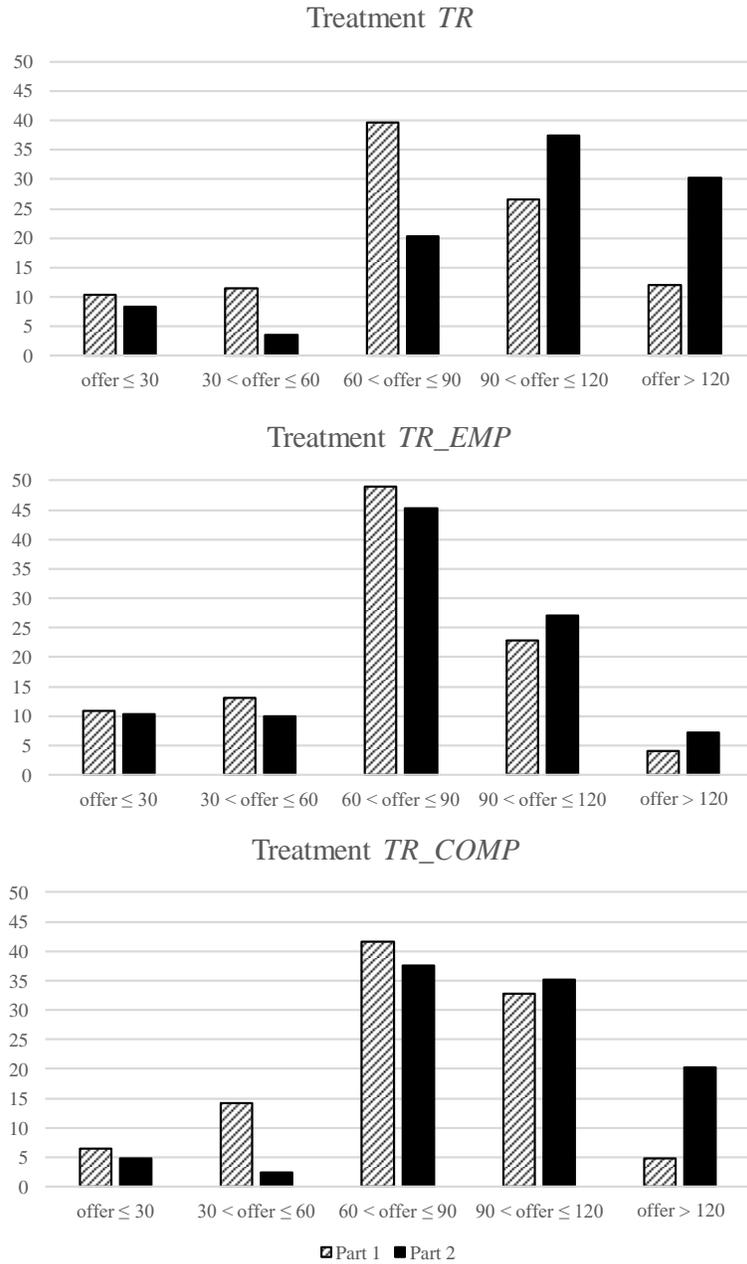
*A1. Additional Results*

Figure A1. Share of differences in offers (*Diff*) per ECU interval in %



The figure displays the percentages of offers implementing a given wage difference in ECU (*Diff*) between the two employees in the treatments *TR\_EMP* and *TR\_COMP*. Only offers profiles accepted by both employees are displayed. Dashed (solid) bars indicate the percentage share of offer profiles in the particular interval in part 1 (part 2) of the experiment.

Figure A2. Share of wage offers per ECU interval and treatment in %



The figures displays the percentage shares of wage offers in a given ECU range separately for each treatment. Dashed bars (solid bars) refer to part 1 (part 2) of the experiment.

## *A2. Experimental Instructions*

### **General information**

Welcome to the experiment. Please read the following instructions carefully. If you have any questions, please raise your hand, and an experimenter will come to you and answer your questions privately at your desk. It is not allowed to communicate with other participants before and during the experiment. If you do not follow these rules, we will have to exclude you from the experiment and all payoffs.

During the experiment, you can earn money depending on your decisions and the decisions of other participants.

In the experiment, we will use ECU (Experimental Currency Unit) as the currency. At the end of the experiment, final payoffs in ECU of all participants will be converted into Euro and paid out in cash. The exchange rate is  $125 \text{ ECU} = 1 \text{ Euro}$ .

None of the participants receives any information about the identity of other participants or about their payoffs during or after the experiment.

This experiment will consist of two parts. You find the instructions for the first part on the next pages. After you have finished the first part of the experiment, you will receive instructions for the second part.

### **Instructions first part**

In this experiment, there are two types of participants: employer and employee. These types are randomly assigned and remain the same during the entire first part. At the beginning of the experiment, you will be informed about your type.

The first part of the experiment consists of 4 rounds. Before every round, a new employer is matched to two new employees. It is ensured in the matching that the same participants will never interact in two consecutive rounds. Neither during nor after the session will any participant be informed about who was paired with whom.

In each round, employees have to work on a task for 3 minutes. The task of the employees is to count the number of 7-digits in a block of randomly generated digits. This means that employees have to count how often the digit “7” appears in the block of digits displayed on the screen. Figure 1 shows an example for such a block of digits. In this example, altogether 25 “7” digits can be found in the block, hence, the correct answer is “25”.

Figure 1. Example block

1864347027	5676820729
1365930706	3328791610
2557363075	7277203676
5767246798	6901771882
7950700623	7929794025
2532005643	9450490648
5259303888	7635404849
3301503061	9135172485
4089276932	6476883622

After counting the 7-digits in one block, the employees enter the number in the blue input box on the screen and confirm their inputs by clicking on the red button “Input/Proceed”. After confirming the input, a new block of randomly generated digits will be displayed on the screen.

The employees have the opportunity to interrupt the task during a round. By clicking on the grey button “Break”, an employee reaches the pause screen. During a break, time continues. As soon as the employee wants to end the break, he or she can return to the task by clicking on the “End break” button. Figure 2 below shows the screen for the working task.

Figure 2. Screen for the working task

Remaining time [s]: 104

Please count the number of 7-digits in the block of digits below and insert the number in the blue field:

2915402915	2928777693
7839180688	6478496259
6513847028	2195540140
8055648081	8411143480
6151256536	813222504
1061731712	9748689880
6227157155	1665043537
1796632268	2518849054
2214385507	8844392774

Number of 7-digits:

With "Break" you can interrupt the task:

With "Input / Proceed" you enter your solution to the current task and proceed to the next task:

Before the first part of the experiment starts, both the employer and the employees participate in a short trial period to become familiar with the task.



After the experiment, the payoffs of the 4 rounds of part 1 will be summed up, converted into Euro and paid out to the participants.

This is the end of the instructions for the first part. If you have any questions, please raise your hand. If there are no further questions, the experiment will start soon.

### **Instructions second part**

In part 2 of the experiment, the decision situation is very similar to part 1. In part 2, all participants keep the same role (employer or employee) they had in part 1.

A new employer and two new employees are matched to each other in every round of part 2, and it is ensured in the matching that the same participants will never interact in two consecutive rounds.

The second part of the experiment also consists of 4 rounds. In each round, each employee automatically receives 150 ECU. Moreover, the employer again has an additional budget of 150 ECU for each employee that he can pay as an extra wage for working on the task.

The extra wages for both employees are subtracted from the employer's budget and paid out to the employee. The part of the additional budget that is not used to pay the employees is kept by the employer.

Before each round starts, the employer negotiates the extra wage separately with each employee via the same procedure as in the first part of the experiment.

After the negotiations have been finalized, the employer makes an offer for the extra wage to both employees.

*[TR: Contrary to the first part of the experiment, each employee is now informed about his or her own offer and about the offer to the other employee.]*

*[TR\_EMP: Contrary to the first part of the experiment, each employee can now ask the employer to communicate the two offers.]*

*If an employee asks the employer to communicate the two offers, this employee is informed about his or her own offer and about the offer to the other employee. Receiving the information about the two offers costs 10 ECU that the employee has to pay.*

*If an employee does not ask the employer to communicate the two offers, this employee is informed about his or her own offer but not about the offer to the other employee.]*

*[TR\_COMP: Contrary to the first part of the experiment, the employer can now choose to communicate the two offers to both employees.]*

*If the employer communicates the offers, each employee is informed about his or her own offer and about the offer to the other employee. The communication of the offers costs 10 ECU that the employer has to pay.*

*If the employer does not communicate the offers, each employee is informed only about his or her own offer but not about the offer to the other employee.]*

Then, each employee has to decide whether to accept the offer or to reject the offer. If the offer is rejected by an employee, this employee does not work on the task in this round and receives only the payoff of 150 ECU. The employer keeps the additional budget for this employee.

If the wage offer is accepted by an employee, the working task starts. For each correctly counted block of the employee, the employer receives a revenue of 25 ECU.

The payoffs for employer and employees in each round are calculated as follows:

Payoff for employees = If the offer was accepted: 150 ECU + extra wage in ECU (between 0 ECU and 150 ECU) [*TR\_EMP: - 10 ECU if the employee chose to be informed about both offers*],  
 If the offer was rejected: 150 ECU [*TR\_EMP: - 10 ECU if the employee chose to be informed about both offers*]

Payoff employer = Total budget for the two employees (300 ECU)  
 - Extra wage to employee 1 if employee 1 accepted the offer (between 0 ECU and 150 ECU)  
 - Extra wage to employee 2 if employee 2 accepted the offer (between 0 ECU and 150 ECU)  
 + (Number of correct entries of employee 1) \* 25 ECU if employee 1 accepted the offer  
 + (Number of correct entries of employee 2) \* 25 ECU if employee 2 accepted the offer  
 [*TR\_COMP: - 10 ECU if the employer chose to communicate the two offers to both employees*]

After each round, each employee is informed about his or her performance in the task. Also, the employer learns about the performance of the employees.

After the experiment, the payoffs of the 4 rounds of part 2 will be summed up, converted into Euro and paid out to the participants.

This is the end of the instructions for the second part. If you have any questions, please raise your hand. If there are no further questions, the second part will start soon.