

Online Appendix

Appendix B Control Treatments

WasRP

Table B1: Panel Regressions on Effort - WasRP

	(1)	(2)	(3)	(4)
	FE	FE	FE	FE
Wage	0.104** (0.0274)	0.113*** (0.0267)	0.113*** (0.0243)	
Recession-dummy		0.454** (0.176)	0.739** (0.189)	0.702** (0.182)
Rec $\times$ Wage cut			-0.608*** (0.139)	-0.495*** (0.113)
Wage ²	✓	✓	✓	
Wage-dummies				✓
Period & Period ²	✓	✓	✓	✓
Constant	-1.659 (0.881)	-2.117* (0.885)	-2.000* (0.826)	7.366*** (0.644)
Observations	643	643	643	643
R ²	0.562	0.571	0.576	0.588

Notes: Panel fixed effects (FE) regressions on effort, only for the WasRP treatment. Standard errors are reported in parentheses, adjusted for clustering at the session level since observations may be dependent within session. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Is an explicit conclusion of a contract between firms and workers necessary to create resistance against wage cuts? As already outlined in the main text, Table 6 shows that whether an no explicit contract conclusion is implemented (CasRP) or not (WasRP), does not make much of a difference with respect to wage cuts. Table B1 provides additional analysis. It provides the same regressions for WasRP that Table 5 provides for CasRP and shows that there is a similar *reference-point effect* in WasRP: wage cuts lead to significantly less effort than stable (or increased) wages. Interestingly, if anything, the intensity of the punishment-reward pattern of workers' behavior seems to be higher in WasRP compared to CasRP. One potential explanation might be that without an explicit contract conclusion, workers might perceive stable (or increased) wages as a kinder act than without such an explicit agreement.

Result 3a: In contrast to conjecture 1, an explicit violation of an agreed upon contract is surprisingly not necessary to generate resistance against wage cuts. Contracts seem to serve as reference points just because they determine the out-of-recession wage and convey this information to workers.

Table B2: Panel Regressions on Effort - CasRP-F

	(1)	(2)	(3)	(4)
	FE	FE	FE	FE
Wage	0.131*** (0.0162)	0.131*** (0.0179)	0.131*** (0.0182)	
Recession-dummy		0.0215 (0.205)	0.0828 (0.248)	0.0993 (0.245)
Rec $\times$ Wage cut			-0.160 (0.218)	-0.170 (0.233)
Wage ²	✓	✓	✓	
Wage-dummies				✓
Period & Period ²	✓	✓	✓	✓
Constant	-2.742*** (0.579)	-2.764*** (0.677)	-2.732*** (0.676)	8.196*** (0.511)
Observations	796	796	796	796
R ²	0.669	0.669	0.670	0.680

Notes: Panel fixed effects (FE) regressions on effort, only for the CasRP-F treatment. Standard errors are reported in parentheses, adjusted for clustering at the session level since observations may be dependent within session. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

CasRP-F

Does more information lead to more rigid wages? As already outlined in the main text, Table 6 shows that the average wage cut in CasRP-F is roughly of the same size as in CasRP. Hence, at least on average, additional feedback for firms seems not to alter the results and does not lead to completely rigid wages. However, it was also outlined in the main text that more information actually leads to a higher frequency of rigid wages but at the same increases the frequency very large wage cuts, leading to an average result comparable to CasRP.

Table A2 provides additional analysis and may illuminate firms' behavior. It shows that workers – as in CasRP – punish wage cuts compared to BASE. Since firms additionally have better information in observing this, more firms seem to pay more rigid wages. Interestingly, however, Table B2 reveals that – unlike in CasRP – workers do not significantly increase their effort for stable wages. Some firms seem to react by cutting even high wages to the minimum wage, punishing the session's pool of not sufficiently reciprocal workers. Importantly, there may still be a reference-point effect; it is, however, insignificant.

Result 3b: In contrast to conjecture 2, more information does not lead to more rigid wages on average.

Nonetheless, the intuition of CasRP-F may still be right: Firms have a tendency to pay more rigid wages. But also workers change their behavior. One suggestion why workers change their behavior might be that with better information workers realize that they a

have powerful punishment device available. With this knowledge, workers seem to forget that they also have to reward stable wages.

Appendix C Additional Analysis: Payoffs

As outlined in the main text, average effort differences between wage cuts and stable (or increased) wages are fairly small (e.g. CasRP: 0.18 - 0.26 effort units in Table 5). This appendix addresses the question whether these small differences can really explain the fairly substantial treatment differences in firms' wage-setting behavior. Reassuringly, differences in workers' behavior lead to payoff differences between firms cutting wages and firms paying stable (or increased) wages. Table C1 provides average profits of firms for different treatments and, for completeness, Table C2 provides similar data for workers' payoffs. For the recession case, profits are also separated for wage cuts versus stable (or increased) wages for those treatments in which this is possible. Profits are in general lower when wages are cut than when they are not cut and this difference is (at least marginally) significant in 4 out of 6 cases. Importantly, Table C1 does not control for the wage level and wages are much smaller

Table C1: Average Firm Profits: All Treatments

	No-Recession		Recession		Wage cut vs. no wage cut	
		All	Wage cut	No wage cut	<i>p</i> -values (Wilcoxon)	
					Individual level	Session level
BASE	31.6	17.8				
CasRP	33.8	17.5	16.6	18.4	0.058	0.463
CasRP-F	33.5	18.6	11.7	19.5	0.239	0.028
WasRP	32.4	16.4	15.4	21.6	0.055	0.035
BASE vs. CasRP	0.018 (0.200)	0.962 (0.748)	<i>p</i> -values: Individual (Session) level (Wilcoxon)			
BASE vs. CasRP-F	0.347 (0.873)	0.593 (0.631)				
BASE vs. WasRP	0.150 (0.873)	0.374 (0.873)				

Notes: The last two columns report two-sided *p*-values of a Wilcoxon signed rank test that evaluates whether the profit distribution is different between wage cuts and stable (or increased) wages. The last three rows report two-sided *p*-values of Wilcoxon rank sum test that evaluate wages in and out of recession are different between treatments.

Table C2: Average Worker Payoffs: All Treatments

	No-Recession		Recession		Wage cut vs. now wage cut	
		All	Wage cut	No wage cut	<i>p</i> -values (Wilcoxon)	
					Individual level	Session level
BASE	55.1	43.3				
CasRP	52.8	47.5	44.9	50.0	0.099	0.463
CasRP-F	53.8	48.9	43.8	53.0	0.001	0.028
WasRP	55.8	49.0	43.8	53.9	0.001	0.028
BASE vs. CasRP	0.140 (0.200)	0.041 (0.263)	<i>p</i> -values: Individual (Session) level (Wilcoxon)			
BASE vs. CasRP-F	0.764 (0.873)	0.008 (0.150)				
BASE vs. WasRP	0.257 (0.873)	0.001 (0.200)				

Notes: The last two columns report two-sided *p*-values of a Wilcoxon signed rank test that evaluates whether the payoff distribution is different between wage cuts and stable (or increased) wages. The last three rows report two-sided *p*-values of Wilcoxon rank sum test that evaluate wages in and out of recession are different between treatment.

Table C3: Panel Regression on Firms' Profits

	(1)	(2)	(3)	(4)	(5)	(6)
	CasRP	CasRP	CasRP-F	CasRP-F	WasRP	WasRP
Wage	0.114 (0.535)		-0.171 (0.433)		0.408 (0.214)	
Wage cut	-4.497* (2.139)	-6.698** (2.506)	-2.586 (2.998)	-2.400 (3.317)	-4.925* (1.892)	-3.321 (2.215)
Wage ²	✓		✓		✓	
Wage-dummies		✓		✓		✓
Period & Period ²	✓	✓	✓	✓	✓	✓
Constant	9.910 (14.95)	18.97 (11.09)	21.50* (9.996)	24.69** (8.873)	8.619 (6.301)	22.30** (6.655)
Observations	207	207	199	199	216	216
R ²	0.053	0.106	0.128	0.187	0.112	0.136

Notes: Panel fixed effects (FE) regressions on firms' profits for the CasRP, the CasRP-F, and the WasRP treatment (only for recession data). Standard errors are reported in parentheses, adjusted for clustering at the session level. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

for wage cuts than for stable (or increased) wages.³⁰

To control for the wage level, Table C3 provides panel (fixed effects) regressions on firms' payoffs. In these regressions, I focus on recession data separately for every treatment in order to control for the treatment-individual wage-effort relationship in recession to the best extent.³¹ For each treatment, two different regressions are provided. First, one regression just controls for the wage and a quadratic wage term. Second, one regression uses the wage dummies already used in Table 5. In all regressions, wage cuts lead to lower profits in recession than stable (or increased) wages. These differences are, however, only (at least marginally) significant for regressions (1),(2) (CasRP), and (5) (WasRP). Hence, when carefully controlling for the wage-level, only in those treatments, in which a significant reference-point effect is observed, profits appear to be lower for firms cutting wages.

Overall, although profit differences are not overwhelming large and by far not always significant, they are in line with the idea that firms pay more rigid wages because workers punish wage cuts. Moreover, Table C2 also provides an indication that the existence of reference points lead to more unequal payoff differences in recession insofar as workers' recession payoffs seem to be higher in those treatments with reference points whereas no difference seems to be observed for the out-of-recession case.

³⁰CasRP-F - wage cuts: $w^{Rec} = 44.7$, stable or increased wages: $w^{Rec} = 59.1$; CasRP - wage cuts: $w^{Rec} = 48.4$, stable or increased wages: $w^{Rec} = 55.3$; WasRP - wage cuts: $w^{Rec} = 46.9$, stable or increased wages: $w^{Rec} = 60.6$. This is also the reason why workers earn less when wages are cut compared when this is not the case although they punish these wage cuts.

³¹Using not only recession but also out-of-recession data leads to slightly different results. In this case, wage-cut dummies for the CasRP-F and the WasRP treatment are significant but not for the CasRP treatment. Nonetheless, I believe that using only recession data is most appropriate in this case because only then the actual wage-effort relationship is captured in the best way.

Appendix D Other Reference Points

In the main text, I analyze whether the initial out-of-recession wage (stage 1) provides a reference point for the recession wage (stage 2). In principle, previous-period wages could also serve as reference points and I analyze whether this is the case in this section. Because stranger matching is implemented, one might not expect that these wages have a huge effect.

Table D1 shows fixed effect (FE) regressions for BASE and CasRP (on which I will focus in this section). Specifications (1) and (2) of this table are structurally similar to specifications (3) and (4) of Table 5. Besides analyzing both treatments at the same time for the ease of exposition, the main difference of Table D1 is that it additionally includes (*pseudo*) “wage cut” dummies that measure whether wages have been cut with respect to the previous period, either for the case the current period is a recession or not. Moreover, specifications (3) and (4) additionally include an interaction dummy between wage cuts and (*pseudo*) “wage cuts”.

A central finding of Table D1 is that the wage cut with respect to the out-of-recession wage ($Rec \times CasRP \times Wage\ cut$) remains significant across all specifications. Including controls for potential other reference points does not undermine the reference-point effect described in the main text. Additionally, in CasRP, the previous wage seems to serve as a reference point in case there is no recession in the current period, which seems not to be the case in the BASE treatment. It seems possible that relying on the out-of-recession wage as a reference point for the recession wage in the CasRP treatment increases the affinity to use also the previous-period wage as a reference point. Notably, this finding is not very robust to performing additional robustness checks.³² Moreover, the previous-period wage seems not to serve as a reference point when a recession occurs in CasRP, and subjects seem to refer to the more relevant out-of-recession wage.

For the BASE treatment, the (*pseudo*) “wage cuts” are nearly always insignificant and suggest that previous-period wages seem not to serve as reference-points in the BASE treatment, as expected. Only for one recession case, one coefficient counter-intuitively is even positive with marginal significance. In specifications (3) and (4), the interaction dummy for which only very few observations exist seems to be positive but clearly insignificant whereas the negative effect of the real wage cuts is even a bit higher than in the regressions before.

In Table D2, I check whether I am also able to detect a pseudo reference-point effect by looking at non-recession and recession data separately. Again, there seems to be an effect for CasRP in (1) and (2), supporting the result of Table D1. When considering, however, only

³²In the analysis so far, the previous period could either be a recession or a non-recession period whereas a real wage cut always occurs with respect to a non-recession wage. When only including non-recession periods as previous wages, only two out of the four $No\ Rec \times CasRP \times “Wage\ cut”$ -coefficients remain significant.

Table D1: Panel Regressions on Effort

	(1) All	(2) All	(3) All	(4) All
Wage	0.135*** (0.0300)		0.135*** (0.0289)	
No Rec $\times$ BASE $\times$ “Wage cut”	-0.0166 (0.241)	0.0191 (0.235)	0.0203 (0.245)	0.0542 (0.238)
No Rec $\times$ CasRP $\times$ “Wage cut”	-0.511** (0.191)	-0.478** (0.160)	-0.528** (0.197)	-0.495** (0.165)
Recession-dummy	0.334* (0.174)	0.313 (0.181)	0.448** (0.192)	0.422** (0.191)
Rec $\times$ BASE $\times$ “Wage cut”	0.411 (0.259)	0.388* (0.201)	0.338 (0.261)	0.316 (0.207)
Rec $\times$ CasRP $\times$ “Wage cut”	0.000228 (0.238)	0.0339 (0.186)	-0.420 (0.315)	-0.375 (0.281)
Rec $\times$ CasRP $\times$ Wage cut	-0.448*** (0.104)	-0.378** (0.126)	-0.899** (0.321)	-0.819** (0.308)
Rec $\times$ CasRP $\times$ Wage cut $\times$ “wage cut”			1.033 (0.731)	1.005 (0.661)
Wage ²	✓		✓	
Wage dummies		✓		✓
Period & Period ²	✓	✓	✓	✓
Constant	-3.232*** (0.734)	6.956*** (0.651)	-3.317*** (0.707)	6.933*** (0.645)
Observations	1338	1338	1338	1338
R ²	0.522	0.532	0.511	0.530

Notes: Panel random effects (FE) regressions for the two main treatments: BASE and CasRP. Standard errors are reported in parentheses, adjusted for clustering at the session level. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table D2: Panel Regressions on Effort

	(1) No Recession	(2) No Recession	(3) Recession	(4) Recession
Wage	0.121*** (0.0245)		0.150** (0.0584)	
BASE $\times$ No Rec $\times$ “Wage cut”	0.0601 (0.207)	0.0482 (0.219)		
CasRP $\times$ No Rec $\times$ “Wage cut”	-0.453** (0.185)	-0.430** (0.150)		
Rec $\times$ BASE $\times$ “Wage cut”			0.248 (0.236)	0.291 (0.168)
Rec $\times$ CasRP $\times$ “Wage cut”			0.0202 (0.337)	0.0496 (0.299)
Wage ²	✓		✓	
Wage dummies		✓		✓
Period & Period ²	✓	✓	✓	✓
Constant	-3.018*** (0.764)	7.318*** (0.557)	-3.140** (1.355)	6.746*** (1.525)
Observations	950	950	388	388
R ²	0.522	0.532	0.521	0.531

Notes: Panel random effects (FE) regressions for the two main treatments: BASE and CasRP. Standard errors are reported in parentheses, adjusted for clustering at the session level. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

previous-period wages from non-recession periods, both coefficients become insignificant. For the recession case (3-4), I only include the pseudo “wage cut” measures to analyze whether there is an effect even when abstracting from the real wage cut and find no significant effect

Overall, there is some but very limited evidence that previous-period wages serve as reference points (in CasRP treatment). Crucially, this evidence seems not to be very robust for different specifications. Most importantly, when controlling for these other potential

reference points, out-of-recession wages still seem to serve as reference points.

Appendix E Instructions

This section provides the translated instructions for all treatments. The instructions are based on Charness et al. (2012) (and partially also on Gerhards and Heinz 2017). After subject read the instructions, an oral summary of the instructions was provided that is presented below. Afterwards, subjects answered test questions displayed on the computer screen and played three trial rounds.

[All treatments: Instructions]

Welcome to our experiment! Please read the following instructions carefully. Your final payoffs will also depend on how good you have understood these instructions. You can ask questions anytime, just raise your hand. But please do not speak with other participants of the experiment any longer.

Overview

You participate in a study about the labor market. One half of all participants will be in the role of an **employer**, and one half of all participants will be in the role of an **employee**. Which role you take, will be decided randomly and you are informed about your role at the beginning of the actual experiment. You will keep your role until the end of the experiment. The **general structure** of the experiment is the following: The employer offers a **wage** to her employee. The employee then decides whether he would like to accept this offer. If he accepts, he then has to decide how much **effort** he would like to exert. The higher his effort, the more his company benefits.

Another important aspect is that the employers' earnings are not constant throughout the experiment. Every period, a **bad market situation** can occur for an **employer** with a probability of $1/3$. Then, the employer's earnings are lower than before.

The Details

The experiment consists out of **18** periods. In every period, you will be randomly matched with another participant of the experiment. The matching works such that you will never meet the same participant in two consecutive periods. Additionally, **one employer is always exactly matched with one employee** and no participant will ever learn the identity of his or her counterpart.

All of the 18 periods proceed in the following way:]

[*BASE only*:

Stage 1: (Contract Offer)

At the beginning of the first stage, the computer **randomly** chooses two out of six employers. Only for these two employers a **bad market situation** occurs, e.g. the earnings of these employers are reduced by **20** points. For all other employers **no** bad market situation occurs. Independent of whether a bad market situation has occurred or not, every **employer** then has to make a **contract offer** to her matched employee by choosing as a **wage** an integer between **30** and **100**.

Stage 2: (Contract Conclusion and Effort)

First of all, the offered wage of his employer is now communicated to the employee. Afterwards, two cases have to be distinguished:

1. **No** bad market situation (for the employer): In this case, the **employee** initially has to decide whether he wants to accept the contract offered by his employer. If he declines the offer, both employer and employee learn their earnings in *Stage 3*, and for them this period is over. If he on the contrary accepts the offer, a **contract** is concluded, and the employee has to choose how much effort he would like to exert. Here, **effort** is a number between **1** and **10**. The higher the effort is, the higher the employee's costs are (compare the Table):

Effort	1	2	3	4	5	6	7	8	9	10
Costs	0	1	2	4	6	8	10	12	15	18

2. **Bad market situation** (for the employer): In this case, the **employee** has to **accept** the contract offered by the employer and hence a contract is always concluded. The employee only has to choose how much effort he would like to exert. Just like in 1., **effort** is a number between **1** and **10**, and the costs of effort are the same as in the Table of 1.

Stage 3: (Earnings)

Now, employees and employers are informed about their (period) earnings. If a contract has been concluded (*Stage 2*), the employer also learns her employee's effort level.

Payoffs

If a contract has not been concluded, the **employer** gets no earnings (= 0 points) in this period.

If a contract has been concluded, the following holds: Wage and effort determine the **employer's** earnings. In the case that a **bad market situation** has occurred, the employer's earnings are moreover **20 points** lower than in the case that no bad market situation has occurred:

$$\text{Employer (no bad market situation)} = (10 * \text{effort}) - \text{wage} + 50$$

$$\text{Employer (bad market situation)} = (10 * \text{effort}) - \text{wage} + 30$$

In both cases we have: The higher the employee's effort level and the lower the wage, the higher the employer's earnings are. Additionally, in both cases it holds that, if the formula leads to negative earnings, the employer gets **0** points. Hence, she can not make losses.

If a contract has not been concluded, the **employee**, contrary to the employer, gets positive earnings of 20 points.

If a contract has been concluded, the following holds: Wage and the costs of effort determine the **employee's** earnings. These earnings are not different between both market situations:

$$\text{Employee (no bad market situation)} = \text{Wage} - \text{costs of effort}$$

$$\text{Employee (bad market situation)} = \text{Wage} - \text{costs of effort}$$

In both case we have: The higher the wage and the lower the effort (or rather the lower the costs of effort), the higher the employee's earnings are.

At the end of the experiment, you will be be paid individually and confidentially. Your payoff will be the sum of all earnings gained in all periods. All points earned in the different periods will be converted in the following way: **35 points = 100 Eurocent**.

Four Examples

1. Situation: A bad market situation does **not** occur! Employer's contract offer: Wage = 50; Employee declines offer!

Employer's earnings = 0 points

Employee's earnings = 20 points

2. Situation: A bad market situation does **not** occur! Employer's contract offer: Wage = **30**; Employee accepts offer and exerts effort = **1**

Employer's earnings = $10 * 1 - 30 + 50 = 30$

Employee's earnings = $30 - 0 = 30$

3. Situation: A bad market situation does **not** occur! Employer's contract offer: Wage = **50**; Employee accepts offer and exerts effort = **5**

Employer's earnings = $10 * 5 - 50 + 50 = 50$

Employee's earnings = $50 - 6 = 44$

4. Situation: A bad market situation does occur! Employer: Wage = **60**; Employee: Effort = **7**

Employer's earnings = $10 * 7 - 60 + 30 = 40$

Employee's earnings = $60 - 10 = 50$

[*CasRP/CasRP-F only:*

Stage 1: (Contract Conclusion)

1. The **employer** makes a **contract offer** to her matched employee by choosing as a **wage1** an integer between **30** and **100**.
2. The **employee** initially has to decide whether he wants to accept this contract offer. If he declines the offer, both employer and employee learn their earnings in *Stage 3* and for them this period is over. If he on the contrary accepts the offer, a **contract** is concluded, and the employee has to choose how much effort he would like to exert (whereof the employer is initially not informed about). Here, **effort1** is a number between **1** and **10**. The higher the effort is, the higher the employee's costs are (compare the Table):

Effort	1	2	3	4	5	6	7	8	9	10
Costs	0	1	2	4	6	8	10	12	15	18

Importantly, a concluded contract is binding for the employee to the extent that he cannot withdraw from the contract in *Stage 2*, even if the employer changes the wage

in *Stage 2*

Stage 2: (Potential contract changes)

At the beginning of the second stage, the computer **randomly** chooses two out of six employers. Only for these two employers a **bad market situation** occurs, e.g. the earnings of these employers are reduced by **20** points. For all other employers **no** bad market situation occurs.

1. If a bad market situation occurs for the **employer**, she has the opportunity to change the existing contract, e.g. she can change her employee's wage in any way. For this purpose, she chooses as a **wage2** again an integer between **30** and **100**. Wage2 and wage1 can be totally different, but also the same values can be chosen for wage1 and wage2.
2. Because an existing contract is binding for him, the employee cannot withdraw from this contract and has to accept any wage change. But also the employee can change his effort in any way. For this purpose, he chooses as **effort2** a number between **1** and **10** (costs are the same as in *Stage 1*). Effort2 and effort1 can be totally different, but also the same values can be chosen for effort1 and effort2.

Employers, for which no bad market situation occurs (and their matched employees) cannot change the contract concluded in *Stage 1* and do not have to provide any input in *Stage 2* and learn their earnings in *Stage 3*.

[*CasRP only: Stage 3:* (Earnings)]

Now, employees and employers are informed about their (period) earnings. If a contract has been concluded (*Stage 1*), the employer also learns her employee's **relevant** effort level: Either effort2 in the case of a bad market situation or else effort1.]

[*CasRP-F only Stage 3:* (Earnings)]

Now, employees and employers are informed about their (period) earnings. If a contract has been concluded (*Stage 1*), the employer only now learns her employee's effort level: In case of a bad market situation, she learns **both** effort1 **and** effort2 such that the employer can see how her employee **has reacted** to a (potential) wage change. In case that no bad market condition has occurred, the employer only learns effort1.]

Payoffs

If a contract has not been concluded, the **employer** gets no earnings (= 0 points) in this period.

If a contract has been concluded, the following holds: In the case that no bad market situation has occurred wage1 and effort1 (initial contract conclusion) determine the **employer's** earnings. In the case that a bad market situation has occurred, wage2 and effort2 (potential contract change) determine her earnings and these earnings are moreover **20 points** lower:

$$\text{Employer (no bad market situation)} = (10 * \text{effort1}) - \text{wage1} + 50$$

$$\text{Employer (bad market situation)} = (10 * \text{effort2}) - \text{wage2} + 30$$

In both cases we have: The higher the employee's effort level and the lower the wage, the higher the employer's earnings are. Additionally, in both cases it holds that, if the formula leads to negative earnings, the employer gets **0** points. Hence, she can not make losses.

If a contract has not been concluded, the **employee**, contrary to the employer, gets positive earnings of 20 points.

If a contract has been concluded, the following holds: In the case that no bad market situation has occurred wage1 and the costs of effort1 (initial contract conclusion) determine the **employee's** earnings. In the case that a bad market situation has occurred, wage2 and the costs of effort2 (potential contract change) determine his earnings:

$$\text{Employee (no bad market situation)} = \text{Wage1} - \text{costs of effort1}$$

$$\text{Employee (bad market situation)} = \text{Wage2} - \text{costs of effort2}$$

In both case we have: The higher the wage and the lower the effort (or rather the lower the costs of effort), the higher the employee's earnings are.

At the end of the experiment, you will be be paid individually and confidentially. Your payoff will be the sum of all earnings gained in all periods. All points earned in the different periods will be converted in the following way: **35 points = 100 Eurocent**.

Four Examples

1. Situation: Employer's contract offer: Wage1 = 50; Employee declines offer!

Employer's earnings = 0 points

Employee's earnings = 20 points

2. Situation: Employer's contract offer: Wage1 = **30**; Employee accepts offer and exerts effort1 = **1**; A bad market situation does **not** occur (hence no contract changes)

$$\text{Employer's earnings} = 10 * 1 - 30 + 50 = 30$$

$$\text{Employee's earnings} = 30 - 0 = 30$$

3. Situation: Employer's contract offer: Wage1 = **50**; Employee accepts offer and exerts effort1 = **5**; A bad market situation does **not** occur (hence no contract changes)

$$\text{Employer's earnings} = 10 * 5 - 50 + 50 = 50$$

$$\text{Employee's earnings} = 50 - 6 = 44$$

4. Situation: Employer's contract offer: Wage1 = **50**; Employee accepts offer and exerts effort1 = **5**; A **bad market situation** occurs (Wage and effort are changed); Contract changes: Wage2 = **60**; Effort2=**7**

$$\text{Employer's earnings} = 10 * 7 - 60 + 30 = 40$$

$$\text{Employee's earnings} = 60 - 10 = 50]$$

[*WasRP only:*

Stage 1: (Contract Offer)

1. First of all, the **employer** makes a **contract offer** to her matched employee for the case that no bad market situation occurs by choosing as a **wage1** an integer between **30** and **100**.
2. Afterwards, the computer **randomly** chooses two out of six employers. Only for these two employers a **bad market situation** occurs, e.g. the earnings of these employers are reduced by **20 points**. For all other employers **no** bad market situation occurs.
3. If a bad market condition occurs for the **employer**, she has the opportunity to change the contract offer made in 1. in any way. For this purpose, she chooses as a **wage2** again an integer between **30** and **100**. Wage2 and wage1 can be totally different, but also the same values can be chosen for wage1 and wage2.

Employers, for which no bad market situation occurs cannot change the contract offer and do not have to provide any further input.

Stage 2: (Contract Conclusion and Effort)

For the **employee** two cases have to be distinguished:

1. **No bad market situation** (for the employer): In this case, the **employee** is informed about wage1 and has initially to decide whether he wants to accept the contract offered by his employer. If he declines the offer, both employer and employee learn their earnings in *Stage 3* and for them this period is over. If he on the contrary accepts the offer, a **contract** is concluded, and the employee has to choose how much effort he would like to exert. Here, **effort1** (no bad market condition) is a number between **1** and **10**. The higher the effort is, the higher the employee's costs are (compare the Table):

Effort	1	2	3	4	5	6	7	8	9	10
Costs	0	1	2	4	6	8	10	12	15	18

2. **Bad market situation** (for the employer): In this case, the **employee** is informed about both wage1 and wage2, where only wage2 is relevant for the payoff. Additionally, he has to **accept** the contract offered by the employer and hence a contract is always concluded. The employee only has to choose, how much effort he would like to exert. Just like in 1., **effort2** (bad market condition) is a number between **1** and **10** and the costs of effort are the same as in the Table of 1.

Stage 3: (Earnings)

Now, employees and employers are informed about their (period) earnings. If a contract has been concluded (*Stage 2*), the employer also learns her employee's effort level.

Payoffs

If a contract has not been concluded, the **employer** gets no earnings (= 0 points) in this period.

If a contract has been concluded, the following holds: In case no bad market situation has occurred, wage1 and effort1 (no bad market situation) determine the **employer's** earnings. In the case that a **bad market situation** has occurred, wage2 and effort2 (bad market condition) determine her earnings and these earnings are moreover **20 points** lower:

$$\text{Employer (no bad market situation)} = (10 * \text{effort1}) - \text{wage1} + 50$$

$$\text{Employer (bad market situation)} = (10 * \text{effort2}) - \text{wage2} + 30$$

In both cases we have: The higher the employee's effort level and the lower the wage, the higher the employer's earnings are. Additionally, in both cases it holds that, if the formula leads to negative earnings, the employer gets **0** points. Hence, she can not make losses.

If a contract has not been concluded, the **employee**, contrary to the employer, gets positive earnings of 20 points.

If a contract has been concluded, the following holds: In the case that no bad market situation has occurred wage1 and the cost of effort1 (no bad market situation) determine the **employee's** earnings. In case that a bad market situation has occurred, wage2 and the costs of effort2 (bad market situation) determine the earnings:

Employee (no bad market situation) = Wage1 - costs of effort1

Employee (bad market situation) = Wage2 - costs of effort2

In both case we have: The higher the wage and the lower the effort (or rather the lower the costs of effort), the higher the employee's earnings are.

At the end of the experiment, you will be be paid individually and confidentially. Your payoff will be the sum of all earnings gained in all periods. All points earned in the different periods will be converted in the following way: **35 points = 100 Eurocent**.

Four Examples

1. Situation: Employer's contract offer: Wage1 = 50; A bad market situation does **not** occur!

Employee declines offer!

Employer's earnings = 0 points

Employee's earnings = 20 points

2. Situation: Employer's contract offer: Wage1 = **30**; A bad market situation does **not** occur!

Employee accepts offer and exerts effort1 = **1**

Employer's earnings = $10 * 1 - 30 + 50 = 30$

Employee's earnings = $30 - 0 = 30$

3. Situation: Employer's contract offer: Wage1 = **50**; A bad market situation does **not** occur!

Employee accepts offer and exerts effort1 = **5**

$$\text{Employer's earnings} = 10 * \mathbf{5} - \mathbf{50} + 50 = 50$$

$$\text{Employee's earnings} = \mathbf{50} - 6 = 44$$

4. Situation: Employer's contract offer: Wage1 = **50**; A **bad market situation** occurs

Contract offer is changed: Employer: Wage2 = **60**; Employee: Effort2 = **7**

$$\text{Employer's earnings} = 10 * \mathbf{7} - \mathbf{60} + 30 = 40$$

$$\text{Employee's earnings} = \mathbf{60} - 10 = 50]$$

[*All treatments:*

Further course of events

When you have finished reading the instructions, please first try to deal with the additional example situations provided at your computer screen. Of course, you can ask questions at any time. When all participants have solved these situations correctly, three **unpaid** trial rounds follow in order to make you familiar with the different computer screens. For reasons of simplicity, the probability of a bad market situation is set to zero in these trial rounds. Afterwards, the 18 periods of the actual experiment start.

A last hint: Because a bad market situation really occurs randomly for employers, a single employer can be hit by such a bad market situation also in consecutive periods and then he may not be hit by such a situation for a longer period of time. Because every employer is exactly matched with one employee, this reasoning also holds for employees. Neither employees nor employers however know how often their counter-part has been hit by a bad market situation in the past.]

Oral Summary of Instructions

The manuscripts for the oral summaries of all treatments are presented below. It is outlined how these manuscripts deviated for individual treatments:

- [*All treatments:* 12 participants participate in this experiment. 6 out of these 12 participants will be in the role of the employer and 6 will be in the role of an employee.
- The experiment consists of 18 periods and in every period a randomly chosen employer is matched with a randomly chosen employee.]

- [*BASE only*: Every period consists out of 3 stages and proceeds in the following way:
 - At the beginning of the first stage, the computer randomly determines for whom of the employers a bad market conditions occurs. Independent of whether a bad market conditions occurs or not, each employer makes a contract offer by choosing a wage, i.e. a number between 30 and 100.
 - In the second stage, the employee is informed about his employer's offer and two cases have to be distinguished:
 1. In case, there is no bad market condition, the employee initially has to decide whether he wants to accept the offered contract. If this is the case, he still has to decide how much effort he would like to exert, i.e. choose a number between 1 and 10.
 2. In case, there is a bad market condition, the employee cannot reject his employer's offer but has to decide immediately how much effort he would like to exert (again a number between 1 and 10).
 - In the third stage, employer and employee are informed about their earnings and the employer is also informed about her employee's effort level.]
- [*CasRP/CasRP-F only*: Every period consists out of 3 stages and proceeds in the following way:
 - At the beginning of the first stage, the employer makes a contract offer by choosing a wage, i.e. a number between 30 and 100. The employee is informed about this offer and has to decide whether he wants to accept it. If this is the case, he has to decide how much effort he would like to exert, i.e. choose a number between 1 and 10.
 - At the beginning of the second stage, the computer randomly determines for whom of the employers a bad market conditions occurs.
 - * An employer for whom a bad market condition occurs, has the opportunity to change the wage for her employee, or she can leave it the same as it is.
 - * The employee is informed about the new wage and cannot reject a potential wage change because an existing contract is binding for him. But also the employee has the opportunity to change his effort, or he leave it the same as it is.]
 - [*CasRP only*: In the third stage, employer and employee are informed about their earnings and the employer is also informed about her employee's relevant effort

level.]

- [*CasRP-F only*: In the third stage, employer and employee are informed about their earnings and the employer is also informed about her employee's effort level:
 - * In case there is a bad market condition, the employer learns both the initial and the potentially changed effort level. Hence, the employer can directly see how a her employee reacted to a potential wage change.
 - * In case there is no bad market condition, the employer naturally only learns the initial effort level.]
- [*WasRP only*: Every period consists out of 3 stages and proceeds in the following way:
 - At the beginning of the first stage, every employer makes a contract offer for the case that no bad market condition occurs, by choosing a wage, i.e. a number between 30 and 100. Then, the computer randomly determines for whom of the employers a bad market conditions occurs. Those employers for whom a bad market condition occurs can change the wage for her employee or leave it the same as it is.
 - In the second stage, two cases have to be distinguished
 1. In case, there is no bad market condition, the employee is informed about her employee's offer and he has initially to decide whether he wants to accept it. If this is the case, he still has to decide how much effort he would like to exert, i.e. choose a number between 1 and 10.
 2. In case, there is a bad market condition, the employee is informed about both contract offers (No bad market condition & bad market condition), but naturally only the employee's offer for the bad market condition is now relevant for payoffs. Additionally, the employer cannot reject his employer's offer but has to decide immediately how much effort he would like to exert (again a number between 1 and 10).
 - In the third stage, employer and employee are informed about their earnings and the employer is also informed about her employee's effort level.]
- [*All treatments*: This is how the periods will proceed. The payoffs of the employer and the employee are calculated in the following way:
 - If no contract is concluded, the employer gets 0 earnings, whereas the employee gets earnings of 20 points. Hence, there is a difference between the employer and the employee.

- The employer’s earnings are the following: $10 * \text{effort} - \text{wage} + 50$ or $10 * \text{effort} - \text{wage} + 30$ (in case of a bad market condition). Importantly, the lowest possible earnings for employers are 0 points.
- So it holds that the higher the employee’s effort level and the lower the wage, the higher the employer’s earnings are. To get a better understanding of the employer’s earnings, let us have a look at the third example: In this situation, the employer pays a wage of 50 and the employee exerts an effort level of 5 (namely the wage divided by 10). Hence, in case no bad market condition occurs, the employer will have earnings of 50 because the term $10 \times \text{effort}$ ($10 * 5$) - *wage* (50) is zero and then the employer just gets the 50 points he gets anyway. More generally, it holds that if the employee follows the strategy to always exert the wage divided by 10 as his effort level, then the employer will always get earnings of 50 (in case no bad market conditions occurs). In case, the employee wants his employer to get a higher earning than 50, he has to exert a higher effort level than 5 in third example (or more generally a higher effort level than the wage divided by 10). In case, the employee wants his employer to get a lower earning than 50, he has to exert a lower effort level than 5 in third example (or more generally a lower effort level than the wage divided by 10). This general structure also holds in case that a bad market condition occurs. The only difference is that the employer’s earnings are reduced by 20 points.
- The employee’s earnings are the following: $\text{Wage} - \text{cost of effort}$.
- It holds that the higher the wage and the lower the effort (or rather the lower the costs of effort), the higher the employee’s earnings are. Importantly, the cost of a specific effort level has to be looked up in the table given in the instructions.
- Finally it holds that your final payment is the sum of all earnings in the experiment and 50 points are converted to 1 Euro.]