Online Appendices to "Do Legal Standards Affect Ethical Concerns of Consumers?"

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Summary

This document contains supplemental analyses (Appendix A) and the experimental instructions (Appendix B). Appendix A consists of an overview of market outcomes for selfish and non-selfish consumer types, an analysis of consumer choices to buy fewer than 10 units, kernel density estimates of non-selfish consumer choices for all wage levels, alternative estimates of Charness and Rabin's (2002) reciprocal fairness model, and details on consumer decision times.

A Additional Analyses
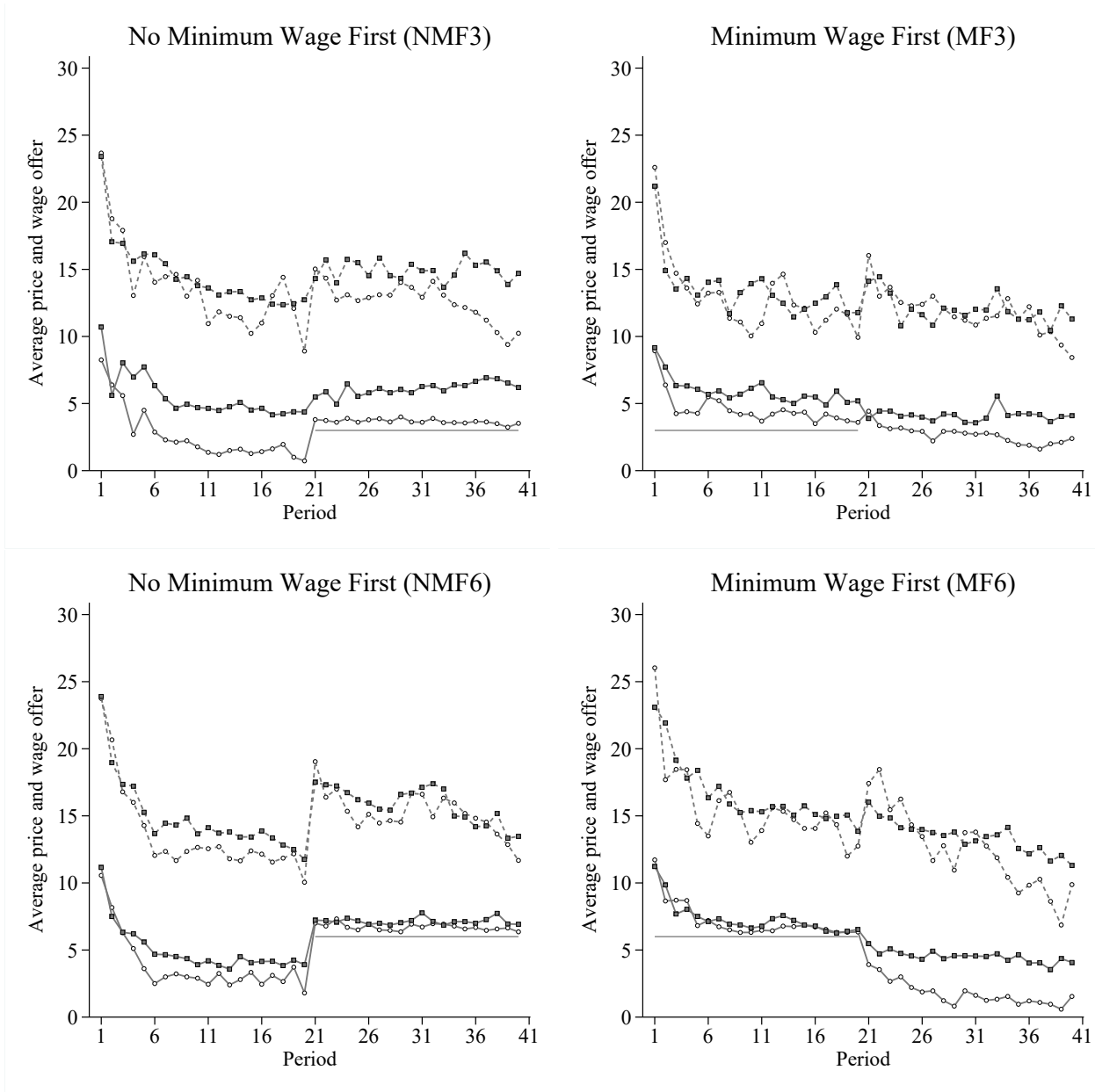
A.1 Firm behavior by consumer type

Figure A1: Market outcomes by consumer types. Circle markers represent markets with consumers who always act in line with self-interest. Square markers represent markets with consumers who deviate at least once from self-interest. Dashed and solid lines represent average price and wage offers, respectively. Horizontal lines indicate the minimum wage.

2

A.2 Consumer behavior

A.2.1 Buying fewer than 10 units

Buying fewer than 10 units in total may be motivated by either self-interest if consumers try to break collusive behavior of the firms or by social concerns for the workers when consumers regard the overall wage level as too low. Although such demand withholding is the most powerful tool for changing the behavior of firms, it is costly for consumers since the loss of buying fewer than 10 units is much higher than buying from a firm with a relatively high price.[1]

If buying fewer than 10 units is driven by social concerns for the workers, we should observe this behavior more often when wage offers are low. By contrast, if the consumers buy fewer than 10 units in order to obtain lower prices in the future, we would expect to observe it more often when the lower of both price offers p_l is high. Table A1 reports regressions where we estimated the effect of the wage and price structure in the market on consumers' propensity to reduce consumption below 10 units. The regressions show that the consumers' propensity to buy fewer than 10 units is not significantly affected by wages but is significantly increasing in the lower of both prices in all treatments, except in MF3 with only marginal significance. Thus, buying fewer than 10 units does not appear to be the result of confusion by the consumers.

Observation 1. *The propensity of consumers to buy fewer than 10 units appears to be driven by attempts to obtain lower prices, since this strategy is chosen more often when prices are higher.*

We add that the consumers' propensity to buy fewer than 10 unit is unrelated to the consumers' propensity to buy from the firm with the strictly higher price. Both actions together occur in only 1.3% of the cases, and they

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[1]Nevertheless, we observe that demand withholding is sometimes quite extreme. In 19.8% of the cases where the consumers bought fewer than 10 units in total (and at least one price offer is below 25), they buy nothing at all.

Table A1: Effect of wages, prices, and minimum wage on consumers' tendency to buy fewer than 10 units in total.

| | Consumer buys fewer than 10 units in total | | | |
| | No minimum wage first (NMF) | | Minimum wage first (MF) | |
	NMF3	NMF6	MF3	MF6
Lower wage offer	−0.036	−0.040	−0.055	0.036
	(0.044)	(0.061)	(0.047)	(0.050)
Wage difference	0.047	−0.038	−0.040	−0.009
(Higher−lower)	(0.036)	(0.046)	(0.037)	(0.032)
Lower price offer	0.068***	0.094***	0.065*	0.156***
	(0.026)	(0.027)	(0.035)	(0.042)
Price difference	0.003	−0.005	0.007	0.000
(Higher−lower)	(0.013)	(0.019)	(0.013)	(0.016)
With minimum	−0.016	−0.413	0.187	−0.123
wage	(0.133)	(0.298)	(0.230)	(0.342)
Constant	−1.994***	−1.975***	−2.364***	−4.587***
	(0.285)	(0.548)	(0.542)	(0.829)
N	875	876	864	863
$\log L$	−295.711	−300.470	−134.051	−55.980

Note: The table shows estimated coefficients of probit regressions. The dependent variable is a dummy for observations where the consumer bought fewer than 10 units in total from both firms. The data from the first six periods in each half are excluded. Standard errors (in parentheses) corrected for clustering at the market level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

are statistically independent.[2] This result is not surprising given that the two choices have different aims, i.e., social concerns motivate purchases from the firm with the higher price, while self-interest motivates buying fewer than 10 units.

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[2]A probit regression of a dummy for consumers buying fewer than 10 units on a dummy for consumers buying at the firm with the strictly higher price yields $p = 0.860$ (standard errors clustered at the market level).
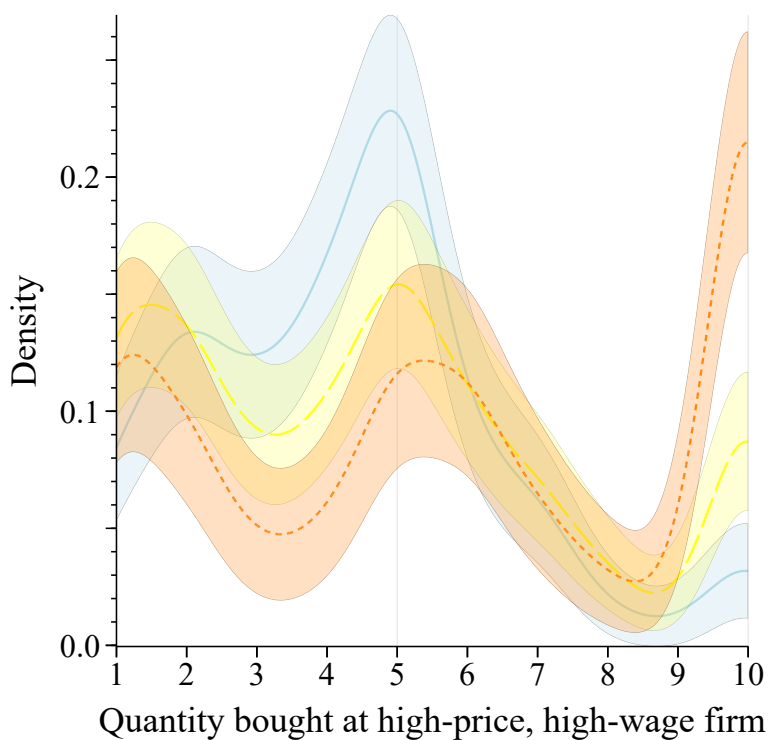
A.2.2 Non-selfish consumer choices

Figure A2: Kernel density estimates of units the consumers bought from the firm with the higher price and the higher wage, conditional on buying at least one unit at that firm: Cases where the lower of the two wage offers is below 2 (dotted line), between 2 and 5, inclusive (dashed line), and above 5 (solid line). Shaded areas represent 95% confidence intervals.

A.2.3 Reciprocal fairness estimation results

Table A2: Estimates of consumers' CR-utility. Same specifications as in Table 4 in the paper, but reciprocity toward firms includes wages and prices.

	Parameter	No minimum wage first		Minimum wage first	
		NMF3	NMF6	MF3	MF6
(1)	$\lambda^{\mu}_{\text{(w/o min wage)}}$	0.336***	0.372***	0.339***	0.424***
		(0.059)	(0.080)	(0.067)	(0.062)
(2)	$\lambda^{\mu}_{\text{(w/ min wage)}}$	0.306***	0.214***	0.140***	0.283***
		(0.075)	(0.065)	(0.054)	(0.085)
(3)	$\Delta\lambda^{\mu}$	−0.030	−0.157***	−0.199***	−0.140
		(0.053)	(0.050)	(0.066)	(0.087)
(4)	$\phi^{\mu}_{\text{(w/o min wage)}}$	0.219***	0.330***	0.445***	0.343***
		(0.066)	(0.077)	(0.123)	(0.073)
(5)	$\phi^{\mu}_{\text{(w/ min wage)}}$	0.336***	0.460***	0.347**	0.233**
		(0.098)	(0.161)	(0.165)	(0.112)
(6)	$\Delta\phi^{\mu}$	0.116	0.130	−0.097	−0.109
		(0.099)	(0.133)	(0.154)	(0.118)
	N	773	765	830	848
	$\log L$	7859.148	7480.324	8480.684	8564.735

Note: The firm's demerit is defined as $d_{f_i} = (\max\{w^* - w_i, 0\}/w^* + \max\{p_i - p^*, 0\}/(50 - p^*))/2$, with $w^* = 10$ and $p^* = 20$. The table shows the mean of the estimated distribution of each parameter in the CR-model with random parameters; estimated precision parameters are $\lambda^{\eta} = \{0.166, 0.340, 0.334, 1.016\}$ and $\phi^{\eta} = \{0.612, 0.652, 1.176, 0.625\}$ for NMF3, NMF6, MF3, and MF6, respectively. Regressions are based on observations where the consumers bought ten units in total; the data from the first six periods in each half are omitted. Standard errors (in parentheses) corrected for clustering at the market level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A3: Estimates of consumers' CR-utility. Same specifications as in Table 4 in the paper, but without additional correction of standard errors for clustering on the market level.

	Parameter	No minimum wage first		Minimum wage first	
		NMF3	NMF6	MF3	MF6
(1)	$\lambda^{\mu}_{\text{(w/o min wage)}}$	0.352***	0.361***	0.338***	0.399***
		(0.037)	(0.033)	(0.031)	(0.031)
(2)	$\lambda^{\mu}_{\text{(w/ min wage)}}$	0.331***	0.230***	0.160***	0.277***
		(0.039)	(0.031)	(0.033)	(0.038)
(3)	$\Delta\lambda^{\mu}$	−0.021	−0.131***	−0.178***	−0.122**
		(0.054)	(0.045)	(0.045)	(0.049)
(4)	$\phi^{\mu}_{\text{(w/o min wage)}}$	0.263***	0.407***	0.507***	0.415***
		(0.046)	(0.048)	(0.061)	(0.048)
(5)	$\phi^{\mu}_{\text{(w/ min wage)}}$	0.331***	0.391***	0.346***	0.248***
		(0.054)	(0.076)	(0.093)	(0.054)
(6)	$\Delta\phi^{\mu}$	0.068	−0.016	−0.161	−0.167**
		(0.071)	(0.088)	(0.114)	(0.071)
	N	773	765	830	848
	$\log L$	7855.012	7583.980	8488.831	8547.427

Note: The table shows the mean of the estimated distribution of each parameter in the CR-model with random parameters; estimated precision parameters are $\lambda^{\eta} = \{0.228, 0.354, 0.377, 1.140\}$ and $\phi^{\eta} = \{0.896, 1.226, 0.935, 1.137\}$ for NMF3, NMF6, MF3, and MF6, respectively. Regressions are based on observations where the consumers bought ten units in total; the data from the first six periods in each half are omitted. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

A.2.4 Consumer decision times

Table A4: Effect of minimum wage on consumer decision times, by selfish and non-selfish consumers, with non-selfish [selfish] defined as consumers who bought at least once [never] from the firm with the striclty higher price.

	Consumer decision time [sec]					
	Minimum wage = 3			Minimum wage = 6		
	All	Selfish	Non-selfish	All	Selfish	Non-selfish
	(1)	(2)	(3)	(4)	(5)	(6)
Minimum	0.335	0.290	0.333	−0.978**	0.360	−1.486**
wage	(0.592)	(0.480)	(0.907)	(0.465)	(0.524)	(0.579)
Period	−0.178***	−0.172***	−0.182***	−0.190***	−0.138***	−0.212***
	(0.035)	(0.023)	(0.054)	(0.024)	(0.024)	(0.031)
Constant	15.230***	12.481***	16.803***	15.433***	11.070***	17.151***
	(1.092)	(1.073)	(1.589)	(1.036)	(1.077)	(1.263)
N	1592	575	1017	1577	432	1145
R^2	0.031	0.086	0.024	0.057	0.078	0.062

Note: OLS regressions of comsumer decision time (in seconds) on minimum wage dummy (1 if minimum wage in place, 0 else) and time trend. The data from the first six periods in each half are excluded. The analysis also excludes cases in which the consumer bougth fewer than ten units in total; the results are qualitatively the same when including these observations, except for the aggregate effect of the minimum wage under a minimum wage of 6 (only marginally significant). Standard errors (in parentheses) corrected for clustering at the market level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A5: Effect of minimum wage on consumer decision times, by maximin and non-maximin consumers, with maximin [non-maximin] defined as consumers who acted at least [less than] three times according to the maximin prediction.

	Consumer decision time [sec]					
	Minimum wage = 3			Minimum wage = 6		
	All	Non-Maximin	Maximin	All	Non-Maximin	Maximin
	(1)	(2)	(3)	(4)	(5)	(6)
Minimum	0.335	0.267	0.443	−0.978**	0.176	−2.053***
wage	(0.592)	(0.570)	(1.394)	(0.465)	(0.461)	(0.748)
Period	−0.178***	−0.178***	−0.179**	−0.190***	−0.183***	−0.198***
	(0.035)	(0.032)	(0.084)	(0.024)	(0.026)	(0.039)
Constant	15.230***	14.705***	16.229***	15.433***	14.301***	16.539***
	(1.092)	(1.139)	(2.344)	(1.036)	(1.149)	(1.662)
N	1592	1035	557	1577	753	824
R^2	0.031	0.035	0.026	0.057	0.051	0.071

Note: Maximin prediction is any quantity that, given price and wage offers, maximizes the minimum payoff of all market participants. The threshold was chosen to achieve the most uniform distribution (56.2% of consumers non-maximin and 43.8% of consumers maximin). OLS regressions of comsumer decision time (in seconds) on minimum wage dummy (1 if minimum wage in place, 0 else) and time trend. The data from the first six periods in each half are excluded. The analysis also excludes cases in which the consumer bought fewer than ten units in total; the results are qualitatively the same when including these observations, except for the aggregate effect of the minimum wage under a minimum wage of 6 (only marginally significant). Standard errors (in parentheses) corrected for clustering at the market level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A6: Effect of minimum wage on consumer decision times, by reciprocal and non-reciprocal consumers, with reciprocal [non-reciprocal] defined as consumers who bought at least once [never] all units from a high-price, high-wage firm.

	Consumer decision time [sec]					
	Minimum wage = 3			Minimum wage = 6		
	All	Non-reciprocal	Reciprocal	All	Non-reciprocal	Reciprocal
	(1)	(2)	(3)	(4)	(5)	(6)
Minimum	0.335	0.516	−0.069	−0.978**	−0.505	−1.484*
wage	(0.592)	(0.458)	(1.440)	(0.465)	(0.566)	(0.760)
Period	−0.178***	−0.167***	−0.203**	−0.190***	−0.200***	−0.176***
	(0.035)	(0.023)	(0.086)	(0.024)	(0.031)	(0.037)
Constant	15.230***	12.984***	18.820***	15.433***	14.600***	16.370***
	(1.092)	(0.874)	(2.348)	(1.036)	(1.509)	(1.390)
N	1592	951	641	1577	853	724
R^2	0.031	0.060	0.024	0.057	0.070	0.047

Note: OLS regressions of comsumer decision time (in seconds) on minimum wage dummy (1 if minimum wage in place, 0 else) and time trend. The data from the first six periods in each half are excluded. The analysis also excludes cases in which the consumer bougth fewer than ten units in total; the results are qualitatively the same when including these observations, except for the aggregate effect of the minimum wage under a minimum wage of 6 (only marginally significant). Standard errors (in parentheses) corrected for clustering at the market level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

B   Instructions

B.1   Translated from German[3]

Welcome to this experiment. You can earn money during this experiment, and your earnings depend on your decisions and the decisions of other participants.

Please read the instructions carefully. If you have a question, please raise your hand. We will answer your questions in private. The instructions are the same for all participants.

The experiment consists of several periods. At the beginning of the experiment, each participant is randomly assigned to a role that remains the same throughout the experiment. You know your own role but not the roles of the other participants. Of course, your anonymity will be kept during the entire experiment. This means that your identity is not revealed to other participants. The same applies to all participants.

In the experiment, there are firms, workers, and consumers. There are two firms, and each firm is matched with a worker who can produce a maximum of ten units of a good. The number of units the worker produces is determined by the number of units the consumer buys from the firm. The firm sets the wage the worker receives per unit sold. Throughout the experiment, a worker is assigned to the same firm. Both firms produce the same good. Both firms offer the good to the same consumer. The consumer can buy a maximum of ten units of the good and can choose how many units to buy from each firm.

At the beginning of the experiment, two firms, two workers, and one consumer—that is, five participants—are grouped together. Throughout the experiment, this group assignment remains the same. This means that the firms, workers, and the consumer you deal with are the same in each period.

The payoffs of the participants are measured in points and depend on their role:

- The worker receives a wage that is paid by their firm. The wage is paid per unit; that is, the worker receives a fixed payment per unit sold,

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[3]The original instructions are available in Online Appendix B.2 below. Treatment differences and annotations are provided in square brackets.

which is set by the firm. [MF Treatments: The wage must be at least three [six] points.] The worker does not have a decision to make. If the consumer does not buy anything from the firm, the worker receives no wage, and thus has a payoff of zero.

- The firm receives the price multiplied by the number of units the consumer buys from this firm, minus the wage payment to the worker. If the consumer does not buy anything from the firm, the firm does not have to pay wages and hence gets a payoff of zero.

- The value the consumer attaches to each unit of the good is 25 points. They can buy a maximum of 10 units, but they can also buy fewer. This means that they get 250 points, minus the total price if they buy 10 units of the good. If the consumer buys fewer than 10 units, they receive the number of units multiplied by 25, minus the sum of the prices they must pay for the units. The consumer can distribute the number of purchased units between the two firms in an arbitrary way, and the consumer is not forced to buy from either of the two firms. If a consumer buys nothing, they receive a payoff of zero in this period.

The timeline of the experiment is as follows:

1. First, the two firms choose the wage for their worker and the price at which they want to sell each unit of the good. [NMF Treatments: The wage and the price must be between 0 and 50 points.] [MF Treatments: The wage must be between 3 [6] and 50 points and the price between 0 and 50 points.]

2. The consumer learns the price set by each firm, and the wage it pays its workers. The consumer then decides how many units to buy from each firm.

3. The purchases are completed.

4. The decisions and payoffs of all participants are displayed on the screen.

This situation is repeated 20 times. You will then be informed of a change in the rules, followed by another 20 periods. However, the roles of all participants in the second part remain the same as in the first part, and the group assignments also remain the same as before.

Your total payoff is the sum of the payoffs in all periods. The exchange rate for the points you can earn during the experiment is 200 points = 1 Euro.

At the beginning of the experiment, you receive a fixed payment of 5 Euro. If you make losses during the experiment, they will be covered by the fixed amount.

Please raise your hand if you have any questions. We will then answer your questions in private.

[Change after the 20th period announced on computer screen:]

There is now a change in the market rules. [NMF Treatments: The wage that a firm sets for its workers must be at least three [six] per unit.][MF Treatments: The wage that a firm sets for its workers, no longer must be at least three [six] per unit. However, it cannot be less than 0.] Everything else remains the same. In particular, the wages are still paid only if the firm is selling something.

B.2   Original German Instructions[4]

Herzlich Willkommen zu diesem Experiment! Sie können Geld verdienen, und die Höhe der Summe, die Sie am Ende erhalten, hängt davon ab, welche Entscheidungen Sie und andere Teilnehmer fällen.

Bitte lesen Sie diese Instruktionen sorgfältig durch. Falls Sie etwas nicht verstehen, zeigen Sie dies bitte per Handzeichen an. Wir werden Ihre Fragen einzeln beantworten. Die Instruktionen sind identisch für alle Teilnehmer.

Das Experiment besteht aus mehreren Perioden. Zu Anfang des Experiments wird jedem Teilnehmer zufällig eine Rolle zugeordnet, die bis zum Ende des Experiments die gleiche bleibt. Sie kennen Ihre eigene Rolle, wissen aber nicht, welche Rollen die anderen Teilnehmer einnehmen. Selbstverständlich bleibt Ihre Anonymität während des gesamten Experiments gewahrt. Das heißt, dass die anderen Experimentteilnehmer Ihre wirkliche Identität nicht erfahren. Das gleiche gilt für alle Teilnehmer.

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[4]Treatmentunterschiede und Kommentare in eckigen Klammern.

Das Experiment beschäftigt sich mit einer Situation, in der es Firmen, Arbeitnehmer und Konsumenten gibt. Es gibt zwei Firmen, und jeder dieser Firmen ist ein Arbeitnehmer zugeordnet, der maximal zehn Einheiten eines bestimmten Produkts herstellen kann. Wieviel er wirklich produziert, hängt davon ab, wie viele Einheiten der Konsument bei der Firma kaufen will. Die Firma legt den Lohn des Arbeiters fest, den er pro verkaufter Einheit erhält. Ein Arbeitnehmer bleibt während des gesamten Experiments der gleichen Firma zugeordnet. In beiden Firmen wird dasselbe Produkt hergestellt. Beide Firmen bieten das Produkt demselben Konsumenten an. Der Konsument kann maximal zehn Einheiten des Guts kaufen und kann sich aussuchen, bei welcher Firma er wie viele Einheiten kaufen möchte.

Zu Anfang des Experiments werden zwei Firmen, zwei Arbeitnehmer und ein Konsument, also fünf Teilnehmer, einander zugeordnet. Während des gesamten Experiments bleibt diese Zuordnung bestehen. Das heisst, dass die Firmen, die Arbeitnehmer und der Konsument, mit denen Sie es zu tun haben, in jeder Runde dieselben bleiben.

Die Auszahlungen der Teilnehmer werden in Punkten gemessen und sind abhängig von ihrer Rolle:

- Der Arbeitnehmer erhält den Lohn, den die Firma ihm bezahlt. Dieser Lohn ist ein Stücklohn, d.h. der Arbeitnehmer erhält pro verkaufte Einheit eine feste Zahlung, die die Firma festlegt. [MF Treatments: Dieser Stücklohn muss mindestens drei [sechs] Punkte betragen.] Der Arbeitnehmer selbst hat keine Entscheidung zu treffen. Wenn der Konsument nichts bei der Firma kauft, erhält der Arbeiter keinen Lohn und hat damit eine Auszahlung von null.

- Die Firma erhält den Preis multipliziert mit der Menge der Einheiten, die der Konsument bei ihr kauft, abzüglich der Lohnzahlung an den Arbeitnehmer. Wenn der Konsument nichts bei der Firma kauft, muss die Firma auch keinen Lohn bezahlen, so dass sie insgesamt null bekommt.

- Der Wert, den der Konsument einer Einheit des Guts zumisst, beträgt 25 Punkte. Er kann maximal 10 Einheiten kaufen, kann aber auch weniger kaufen. Das heißt, dass er 250 Punkte abzüglich des Gesamt-Preises erhält, wenn er 10 Einheiten des Guts kauft. Wenn er weniger als 10 Einheiten kauft, erhält er die Anzahl der Einheiten multipliziert

mit 25 abzüglich der Summe der Preise, die er dafür bezahlen muss. Der Konsument kann den Kauf der Einheiten auf die beiden Firmen verteilen wie er möchte, und er ist nicht gezwungen, bei einer der beiden Firmen zu kaufen. Kauft ein Konsument nichts, so erhält er in dieser Periode keine Auszahlung.

Der Verlauf des Experiments sieht wie folgt aus:

1. Zuerst wählt jede der beiden Firmen den Lohn für den Arbeitnehmer, der ihr zugeordnet ist, und den Preis, zu dem sie jede Einheit des Produkts verkaufen will. [NMF Treatments: Sowohl der Lohn pro Stück als auch der Preis müssen zwischen 0 und 50 Punkten liegen.] [MF Treatments: Dabei muss der Lohn pro Stück zwischen 3 [6] und 50 Punkten liegen und der Preis zwischen 0 und 50 Punkten.]

2. Der Konsument erfährt, zu welchem Preis jede der Firmen das Gut anbietet und welchen Stücklohn sie ihrem Arbeitnehmer bezahlt. Daraufhin entscheidet er, wie viele Einheiten er jeweils kaufen möchte

3. Die Käufe werden abgeschlossen.

4. Die Entscheidungen und Auszahlungen aller Teilnehmer werden auf dem Bildschirm angezeigt.

Diese Situation wird 20 Mal wiederholt. Dann folgen weitere 20 Perioden, vor denen wir Sie über eine Änderung der Regeln informieren werden. Die Rollen aller Teilnehmer bleiben jedoch im zweiten Teil dieselben wie im ersten Teil und auch die Gruppe bleibt die gleiche wie vorher.

Ihre Endauszahlung setzt sich aus der Summe der Auszahlungen in allen Perioden zusammen. Der Wechselkurs für die Punkte, die Sie im Lauf des Experiments verdienen können, beträgt 200 Punkte=1 Euro.

Sie bekommen am Anfang einen Festbetrag von 5 Euro. Falls Sie Verluste machen, werden diese mit dem Festbetrag verrechnet.

Wenn Sie etwas nicht verstanden haben, zeigen Sie dies bitte per Handzeichen an. Wir werden Ihre Fragen dann einzeln beantworten.

[Änderung nach der 20.Periode, angezeigt auf dem
Computer Bildschirm:]

Es gibt nun eine Änderung in den Marktregeln. [NMF Treatments: Der Lohn, den eine Firma ihrem Arbeitnehmer anbietet, muss mindestens drei [sechs] pro Stück betragen.][MF Treatments: Der Lohn, den eine Firma ihrem Arbeitnehmer anbietet, muss nun nicht mehr mindestens drei [sechs] pro Stück betragen. Allerdings kann er nicht kleiner als 0 sein.]Alles Andere bleibt gleich. Insbesondere muss der Lohn weiterhin nur bezahlt werden, wenn die Firma etwas verkauft.