Abstract

Many people are concerned about negative externalities of globalized markets. Yet, the share of ethical products in retail sales remains surprisingly low. It seems that in contrast to their stated preferences only few consumers make their purchase decisions dependent on firms' compliance with ethical norms - they do not "walk their talk." I argue that two main reasons may pose an obstacle to ethical consumption. First, a lack of transparency which diminishes consumers' willingness to pay higher prices for more ethical products. Second, consumers do not sacrifice money for ethical consumption, because they fear that other consumers do not do so either. In this thesis, I analyze how corporate responsibility is affected by transparency, collective buying decisions and their interplay in an economic experiment. In line with previous studies, I find that transparency about negative externalities of production processes increases consumers' tendency to buy expensive and ethically produced goods and thus, to force firms to produce more compliantly. On the other hand, collective buying decisions do not have a similar effect. Rather, consumers do not use market power to foster ethical production, because they are reluctant to impose their ethical values upon other consumers.

1 Introduction

Traditionally, competition between firms is assumed to lead to efficient usage of resources, low consumer prices and high rates of innovation. On the downside, competition decreases the intrinsic motivation of firms to avoid negative externalities. Thereby reduced corporate responsibility results in adverse consequences such as environmental pollution or detrimental working conditions. This would not necessarily be the case if consumers considered negative externalities in their buying decisions. If they did not buy products they consider unethically produced and instead refrained from consumption or chose more expensive but ethically produced goods, firms would be forced into reducing negative externalities to the level consumers approve of.

Yet, this dynamic seems to not fully work in today's markets. Although a substantial share of consumers state favorable attitudes towards ethical consumption even if it includes paying higher prices (Öberseder et al., 2011; Devinney, 2011), the actual market for ethical products remains relatively small (Young et al., 2010). There is a substantial inconsistency between consumers' stated values and their actual purchase decisions (Carrington et al., 2014; Carrington et al., 2010; Eckhardt et al., 2010; Grunert et al., 2014; Hassan et al., 2016; Vermeir and Verbeke, 2006). A main reason why consumers refrain from buying ethical products is a lack of transparency about the products' actual ethical attributes (Papaoikonomou et al., 2011; Balineau and Dufeu, 2010). These attributes typically are credence attributes, meaning that they are not apparent in the products themselves and cannot be easily evaluated even after consumption. Therefore, consumers are left with uncertainty whether their perception of which goods are produced ethically is accurate,

which decreases their motivation for ethical consumption (Enste et al., 2012).

Another effect that influences consumers' tendency to buy ethical products are doubts about the effectiveness of individual ethical consumption to promote ethical production due to the low market power a single consumer exerts (Schlaile et al., 2018; Ellen et al., 1991). Thus, if consumers do not expect others to join in buying ethical products they are less willing to do so themselves which leads to a social dilemma (Gupta and Ogden, 2009). This has also been recognized in research on consumer boycotts (John and Klein, 2003; Sen et al., 2001). Consumers hesitate to participate because they know that only if a sufficient share of consumers will refrain from buying from an egregiously behaving firm a boycott can eventually succeed. Successful boycotts overcome this social dilemma by convincing consumers to take a leap of faith and make their buying decisions as if enough fellow consumers would act accordingly. Thus it can happen that consumers collectively use their market power to achieve their goal of influencing the supply side of the market (Braunsberger and Buckler, 2011; Klein et al., 2004). In contrast to boycotting campaigns, a normal market environment does not offer a clear identification of what ethical consumption behavior actually is. What happens then if consumers are provided increased market power? Will they use it to promote ethical production according to their own judgement? This question has not been investigated empirically so far. The value of exploring how consumers decide when they yield market power lies in using the results as a benchmark that reveals consumers' actual ethical preferences.

The aim of this study is to analyze the effect of both transparency and increased consumer market power on ethical consumption and corporate social responsibility in a competitive market. It presents results from a market experiment in which producers decide on a product price and their production costs. The height of the production costs, in turn, defines the degree of a negative externality such that low production costs entail a large negative externality, and high production costs entail a small negative externality. The produced goods are then offered to consumers who make a purchase decision. Varying transparency about production costs allows for first, analyzing how producers and consumers behave when consumers are aware of the potential of negative externalities, the level of which is only known to producers and second, how production and consumption change when consumers know how the goods they buy have been produced. Introducing collective buying decisions as a tool to exert market power allows for analyzing whether consumers increase their level of ethical consumption if they are reassured of equally ethical consumption of other consumers. Moreover, the interplay of transparency and collective buying decisions reveals whether transparency alone is sufficient to achieve an acceptably low level of negative externalities or whether this goal is only attainable when transparency and increased market power are combined.

2 Related literature

The substantial gap between stated preferences and actual purchase behavior of consumers limits the explanatory power of survey based research on the issue of ethical consumerism. To overcome this problem, field experiments have been employed to study consumers' preferences concerning the ethical characteristics of products they buy. In general, consumers seem to be willing to pay higher prices for ethically produced goods (Hiscox et al., 2011; Arnot et al., 2006). This seems to be a robust result throughout cultures (Yang et al., 2012; Auger et al., 2008) and also throughout different income levels of consumers (Kempen et al., 2009). Also, the price elasticity of demand seems to be smaller for ethical products than for other products. Arnot et al. (2006) introduced price shocks for both fair trade coffee and normal coffee and found that the demand for fair trade coffee was much less responsive to price shocks than demand for other coffee. Hainmueller et al. (2015) discovered that preference for quality and ethical aspects interact such that purchasers of a more expensive fair trade coffee brand react less sensitively to price increases than purchasers of a cheaper fair trade coffee brand. Moreover, Auger et al. (2010) found that preferences for social attributes of products are not crowded out buy other intangible characteristics. However, in a laboratory experiment Kraft et al. (2014) have shown that consumers' willingness to pay as well as their tendency to reward/punish producers for social/unsocial production decreases with a decreasing level of transparency. Therefore, the experiment presented here features both a no transparency and a full transparency scenario.

In experimental economics, analysis of human behavior in markets has been a key topic for many years. Early studies employ experimental markets with induced supply and demand curves, i.e. producers and consumers are attributed different costs of production and product values respectively. In general, these studies confirm convergence towards theoretically predicted price equilibria (Smith and Williams, 1982; Smith, 1962; Plott and Smith, 1978). This is also true when market transactions exert fixed negative externalities on other market participants and thus incur social costs (Plott, 1983). Also, market participants' perceptions of fairness derived from previous transactions do not persistently alter market outcomes (Franciosi et al., 1995). The baseline treatment of the experiment presented here relates to these experiments because it allows for analyzing a simple market in which only the price of a product is observable for consumers. The special feature compared to these early studies is a negative externality unrelated to market participants the level of which is subject to producers' decisions and not revealed to consumers.

Evidence from other experimental studies shows that ethical considerations have a substantial influence on human behavior (e.g. Roth, 1995; Forsythe et al., 1994). Market exchange though has been accused of crowding out such considerations (e.g. Sandel, 2012). The interaction of market exchange with the moral perception of market participants has therefore drawn further attention. By introducing additional proposers and responders in ultimatum games, Fischbacher et al. (2009) showed that competition can crowd out

fairness concerns amongst bargaining parties. Falk and Szech (2013) demonstrated that a bargaining setting can lower moral concerns about negative externalities on third parties. However, even under competition and with bargaining, participants tend not to completely ignore negative externalities and show some willingness to forgo profit in order to mitigate them.

Two recent studies have explored the effect of negative externalities on third parties in competitive markets under varying degrees of transparency (Bartling et al., 2015; Pigors and Rockenbach, 2016). In the market design in Bartling et al. (2015) producers can either offer a "fair" good which is produced without negative externalities or an "unfair" good, the production of which inflicts a payoff reduction for a third party. In several treatments Bartling et al. (2015) vary the level of transparency and producer competition. They find that there is a substantial share of fair goods in supply and demand. This social responsibility is robust throughout varying market conditions. The negative externality in this experiment only occurs when a good is sold. This 'production on demand" feature does not resemble the typical situation of a consumer in a retail market where products are ready for sale. Pigors and Rockenbach (2016) model the externality as a wage that is paid to a third participant. The producer decides upon the wage before goods are offered and the third participant receives the wage regardless of whether the produced good is sold or not. They also vary transparency and show that more transparency leads to lower negative externalities and equilibria in which consumers and producers share the cost of mitigating them.

No experimental market study so far equips consumers with market power to analyze whether they make use of it to promote ethical production more consistently than they do if consumers' decisions are independent from each other. Consumer market power could thus force firms to reduce negative externalities to levels that are lower than in conventional scenarios with independent consumers. Measuring such a level and thus creating a benchmark against which to compare market outcomes without consumer market power is the main contribution of the experiment proposed here.

I build upon the competitive market experiment in Pigors and Rockenbach (2016) but choose to use a different externality. The distribution of payoffs between producer, consumer and third participant is a question of fairness amongst otherwise equal individuals. In reality though, negative externalities such as "production with detrimental working conditions," "environment pollution" or "abuse of power" that consumers attribute to products they are offered are much more vague. Buying products of firms accused of such wrongdoings is not so much a question of fairness but of violating social norms. I take that into account and use a decrease in the amount of money donated to a charity as a negative externality. This is a standard approach in the literature to model outside effects in experiments (e.g. Eckel and Grossman, 1996; Fong, 2007; Lambsdorff and Frank, 2010; Etilé and Teyssier, 2016; Feicht et al., 2016).

3 Experimental design

My experiment allows for studying the effects of transparency and consumer market power in a simple market environment. Participants play in groups of four. Each group k resembles a Bertrand duopoly consisting of two producers s and two consumers x where each producer can serve both consumers.

Producers receive an initial endowment of 10 Taler and decide on the price $p \in [0, 1, ..., 30]$ Taler and the total production cost $c \in [0, 1, ..., 10]$ Taler of two units of a homogeneous good. The production costs are sunk costs (i.e. independent of the amount of goods sold subsequently) and determine the size of the external effect of production. The externality is modeled by decreasing an initial amount of 20 Taler for every group intended for donation to Médecins sans Frontières.[1] Production costs of 10 Taler do not cause externalities and thus do not decrease the donation. Every Taler of production cost saved reduces the donation by one Taler. Production costs of 0 Taler thus decrease the value of the donation by 10 Taler. The donation of a group D_k in Taler remaining at the end of a period is thus calculated as

$$D_k = 20 - \sum_{s_k=1}^{2} 10 - c_s,$$

where s_k is the index for the producers of a group. If both producers of a group choose production costs of 0 Taler the donation will be 0 Taler.

After the producers have made their decisions, the offers of both producers of each group are presented randomly ranked as offer 1 and offer 2 to the consumers of their group. Then, consumers decide whether to buy a good and if so of which producer. In the baseline treatment, consumers know the price of the goods but not the production costs. The value of all goods for the consumer is 30 Taler. A consumer can only buy one good, thus his buying decision $b \in \{0, 1\}$. Consequently, the number of goods sold by a single producer $n \in \{0, 1, 2\}$. The payoff in Taler is calculated as follows:

$$\pi_s = 10 - c + n * p \qquad \text{... payoff for producers}$$

$$\pi_x = \begin{cases} 0 & \text{if } b = 0 \\ 30 - p & \text{if } b = 1 \end{cases} \qquad \text{... payoff for consumers}$$

A producer's payoff π_s is the initial endowment of 10 Taler minus production cost c plus number of goods sold n times the price p. The payoff for a consumer π_x is 0 when she does not buy a good ($b = 0$) and the value of the good of 30 Taler minus price p when she buys a good ($b = 1$).

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[1]In order to achieve a more intuitive understanding low production costs were illustrated as detrimental working conditions and the reduction of the donation amount was referred to as health damage.

Three additional treatments alter the baseline treatment in two dimensions. Firstly, transparency is added, which means that consumers know about the production costs of the goods on offer. This is similar to the full information treatment in Pigors and Rockenbach (2016). Consumers in the transparency treatments are thus informed about the ethical impact of the goods when they make their buying decision. Secondly, collective buying decisions is added. This means both consumers of a group simultaneously make a suggestion for a collective buying decision. The suggestion process in the collective buying decision treatments just doubles the choosing interface from the individual decision treatments to hold the choosing of goods as similar as possible in all treatments. A buying suggestion in the collective decision treatments therefore consists of choosing one good for oneself and one good for the other consumer. Both choices together result in a suggestion whether to collectively buy zero, one or two goods and from which producer to buy goods. The suggestion can also be to buy one good from each producer. After both consumers have made their suggestions one of their suggestions is randomly picked and put into practice as their collective buying decision. Both consumers share the payoff from the collective decision equally. Instructions for producers did not differ between individual and collective buying decision treatments but were carefully written to avoid deception (see Instructions in the Appendix). Therefore, producers do not know about the process of consumer decision making. All possible combinations of transparency type and decision making process result in four treatments, shown in Table 1: the No Transparency and Individual decision treatment (NTI), the Transparency and Individual decision treatment (TI), the No Transparency and Collective decision treatment (NTC) and the Transparency and Collective decision treatment (TC).

	Individual buying decisions	collective buying decisions
No Transparency	Baseline treatment, NTI	NTC
Transparency	TI	TC

Table 1: Treatment matrix

After making their buying decision (henceforth the term buying decision means both buying decisions from the individual decision treatments and buying suggestions from the collective decision treatments) consumers are asked about their expectations of the other consumer's buying decision. In the collective decision treatments this means to asked about expectations of the other consumer's suggestion. To reduce complexity, stating the expectations about suggestions did not include distinguishing between the good chosen for oneself and the good chosen for the other consumer. At the end of each period consumers are informed about their the payoff resulting from their buying decision. In the collective decision treatments this includes learning whether their own or the other consumer's suggestion has been put into practice. Producers are informed about how many consumers

decided to buy from them and which payoff results from the number of sold goods. They did not learn about the other producer's price, production cost or number of sold goods.

4   Research hypothesis

Under standard assumptions of rational payoff maximization, producers are expected to maximize their profit with production costs of 0 Taler, thus decreasing the donation by 10 Taler in all periods in all treatments. Furthermore, in light of excess supply, competition between producers should drive prices down, leaving producers with (almost) no surplus and maximizing consumers' welfare. The two Nash equilibria are both producers offering the same price of 0 or 1. If both offer a price of 0 they have no incentive to deviate because consumers would always buy the remaining zero price offer. If both offer a price of 1 their expected revenue is 1, which is more than they would earn if they offered their goods for nothing. However, the existing evidence for social preferences alters the expectation of producer and consumer behavior. People are usually not completely indifferent to other people's welfare and tend to share a given amount of money, as results from dictator games show (Camerer, 2003, p. 57). Etilé and Teyssier (2016) have shown that this is also true if the second party is not another participant in an experiment but a charity organization. I thus expect the production costs to be larger than zero. Moreover, in alignment with Fischbacher et al. (2009), competition is not expected to drive prices down to 1 or zero but to remain on a higher level because of fairness aspects.

Again, under standard assumptions, rational consumer behavior should not be influenced by knowledge that producers face a trade-off between production costs and the amount of the donation. On the contrary, extensive research on ethical consumption behavior suggests that consumers are sensitive towards ethical issues (e.g. Vitell, 2003; Belk et al., 2005; Green and Peloza, 2011; Vitell, 2015). However, without information on production costs, they can only make a guess about the social impact of the goods on offer by using the price level as a signal for the height of production costs. Consumers might interpret a high price as a signal for ethical production, because they believe producers charge a more or less constant surplus on top of their production costs. This could reduce consumers' price sensitivity in NTI as compared to expectations under rational payoff maximization and thus lower the price pressure for producers. On the other hand, consumers risk getting tricked because producers know that they might think that way. If consumers are aware of that, they might simply buy the cheapest good despite their ethical concerns. This reasoning also applies to NTC. Collective buying decisions do not alter the expected outcome even if fairness preferences are taken into account because consumers do not know how ethically the goods on offer have been produced. Nevertheless, NTC is important to control whether adding collective buying decisions without transparency makes any difference.

When consumers know the production costs of offered goods, they can compare the offers not only by price but also by their ethical impact. Compared to NTI, this should

first of all lead to higher sensitivity to production cost differences between the goods offered. Under competition, the increased consumer sensitivity to production cost differences should force producers to take on higher production costs in the transparency treatments.

Hypothesis 1a *Consumers more often buy the good with higher production cost in TI and TC than in NTI and NTC.*

Hypothesis 1b *Production costs in TI and TC are, on average, higher than in NTI and NTC.*

Consumers' decisions do not have any direct impact on the donation amount. Nevertheless, consumers might feel responsible to reward or to punish producers' choice of production cost with their buying decision. This behavior is best illustrated by the notion of social reciprocity by Carpenter et al. (2004). They state that people are willing to demonstrate their disapproval, at personal cost, for the violation of widely-held norms. In other words, they might be willing to forgo some monetary profit and eventually buy the more expensive good (given that the more expensive good was produced with higher production cost) or even refrain from buying a good for the sake of punishing unethical production. This would also be in line with the findings of Fehr and Fischbacher (2004) on third-party punishment. Compared to the no transparency treatments, this should lead to an increased willingness to pay higher prices if production costs are higher. Therefore, because I expect higher production costs in the transparency treatments I also expect prices to be higher.

Hypothesis 2a *Consumers more often refrain from buying a good and more often buy the expensive (and ethically produced) good in TI and TC than in NTI and NTC.*

Hypothesis 2b *Prices in TI and TC are, on average, higher than in NTI and NTC.*

The model of inequality aversion ERC (equity, reciprocity and competition) by Bolton and Ockenfels (2000) assumes that individuals' utility does not only depend on their absolute payoff but also on their relative payoff within the group. Applied to my experiment, the ERC model predicts a decreasing motivation for a consumer to refrain from consumption, if she expects the other consumer to buy any good.

Another prominent model, the inequity aversion model by Fehr and Schmidt (1999), calculates a disutility for individuals from their payoff being different from other people's payoff. It allows for a separate evaluation of positive and negative differences. If a consumer buys a good, she and the producer whose good she buys will have a positive payoff. This possibility increases the incentive for the second consumer to also buy a good because of inequality aversion. However, there is a chance that one producer makes two sales and the other producer makes no sale. Then, one producer might have a high payoff ($\pi_s = 10 - c + 2 * p$) and the other producer a very low payoff ($\pi_s = 10 - c$). This could theoretically decrease the incentive for a consumer to buy a good if she expects the other consumer to buy a good. Yet, this is very unlikely for two reasons. First, applying the

model of Fehr and Schmidt (1999) to results from ultimatum games suggests that negative differences (i.e. own payoff is lower than other people's payoff) loom much larger than positive differences. Therefore, the low payoff of one producer should not greatly affect a consumer's utility. Second, competition should result in low prices. The payoff of a producer will be moderate even if she makes two sales. Therefore, a producer making two sales will probably not earn much more than a consumer who buys a good. Hence, the willingness of a consumer to refrain from buying a good might be deteriorated by both inequality and inequity aversion.

In the ERC model (Bolton and Ockenfels, 2000), it does not make a difference for a consumer's utility whether one producer makes two sales or each producer makes one sale. Therefore, the model can also make a prediction of how inequality aversion might influence the decision of which good to buy. The prospect of the other consumer buying the cheap good and thus earning more will decrease the incentive of a consumer to buy the expensive good.

In the collective buying decision treatments, these effects are ruled out, because consumers know that the decision of one of them will be binding for both. In other words, consumers vote for a collective buying decision to be put in practice. Here, inequality in the payoffs of consumers is not possible and the payoffs of producers are under the control of the consumer. Inequality/inequity aversion thus cannot decrease the willingness to refrain from buying a good or to buy an expensive good instead of a cheap one. As the willingness to refrain from buying or to buy the expensive good originally stems from concerns about ethical production, I do not expect collective buying decisions to have any impact in the no transparency treatments, in which consumers do not know the production costs. Under transparency, on the other hand, collective buying decisions should increase the tendency to buy expensive and ethically produced goods and the tendency to buy no good at all if production costs of both goods offered are too low. This should lead to higher prices and higher production costs.

Hypothesis 3a *Consumers more often refrain from buying a good and more often buy the expensive (and ethically produced) good in TC than in TI.*

Hypothesis 3b *Prices and production costs in TC are, on average, higher than in TI.*

5 Experimental implementation

To account for learning effects the market game was repeated for 20 periods. Participants played in groups of four (two producers and two consumers) and were randomly rematched into groups in every period to have independent observations. Participants kept their role throughout the whole experiment.

For each of the four treatments I conducted two sessions with 16 participants each. Thus, in every treatment 32 participants (16 producers and 16 consumers) played over 20

periods resulting in 640 observations (320 of producers and 320 of consumers) for each treatment. In total, 128 participants took part in the experiment.

At the beginning of the experiment general instructions were read out loud. Participants could read the specific instructions of the experiment in print at their desk. Before the market game started participants had to answer comprehensive questions (see Appendix) correctly to be able to proceed. Answering correctly at the first try was rewarded with 0,2 Taler per correct answer. After playing the 20 periods of the experiment participants were asked to answer a questionnaire that allows for controlling for their attitude towards ethical production and ethical consumerism (see Appendix).

At the end of the experiment one out of the twenty periods was randomly selected to determine the real payoffs for participants. The final amount was calculated by a participant's payoff from the payoff period, her payoff from answering the comprehensive questions and an additional payoff of 1 Taler for consumers if their expectation of the other consumer's buying decision was correct in the payoff period. The resulting amount in Taler was transferred into real money at an exchange rate of two Taler for one Euro. In case the resulting amount in Taler was below 3,50 € a participant received 3,50 €. The average payoff in Euro for participants was 10,60 € with a minimum of 3,5 € and a maximum of 24,00 €.

The actual donation to Médecins sans Frontières was also determined by the selected payoff period. The donation amounts in this period were also transferred into real money at an exchange rate of two Taler for one Euro. The donations in the payoff period of all groups in a all sessions ranged from a minimum of 0 € to a maximum of 9,50 € and amounted to a total donation of 164 €. This amount was donated to Médecins sans Frontières. Participants were provided a web link where they subsequently could find a donation confirmation and an overview over the single group contributions to the total donation amount.

The experiment sessions were conducted in May 2018 in the PAULA laboratory at the University of Passau, Germany. Sessions lasted from 58 to 68 minutes. I programmed the experiment using the software z-Tree (Fischbacher, 2007) and recruited the participants with ORSEE (Greiner, 2004).

6 Results

This section presents the results of my experiment with respect to the derived hypothesis. In the following, all comparisons between treatments use the Man-Whitney U (MWU) test and comparisons within treatments use Wilcoxon Singed-Rank (WSR) test, both two-sided and clustered by subject number. First, I look at the aggregated market outcomes, second, I examine consumers' propensity to refrain from consumption, third, I study consumers' preferences for price and production cost, fourth, I evaluate the expectations stated by consumers about other consumers' behavior and fifth, I analyze the determinants of profitable production.

	NTI	TI	NTC	TC
Production cost	3,44 (3,44)	6,41 (3,63)	4,10 (2,97)	6,69 (3,42)
Production cost of goods rejected	3,69 (3,42)	5,91 (3,64)	4,15 (3,12)	6,17 (3,35)
Production cost of goods bought	3,18 (3,45)	6,94 (3,55)	4,05 (2,81)	7,22 (3,42)
Price	12,38 (4,35)	12,01 (4,69)	11,23 (5,31)	11,66 (3,66)
Price of goods rejected	14,05 (4,79)	12,93 (4,95)	13,03 (5,78)	12,60 (3,92)
Price of goods bought	10,58 (2,90)	11,01 (4,16)	9,39 (4,03)	10,71 (3,08)
Price surplus over production cost	8,94 (4,80)	5,61 (4,08)	7,12 (5,51)	4,97 (4,06)
Sold goods per producer	0,963 (0,902)	0,956 (0,844)	0,994 (0,934)	0,994 (0,953)
Profit producer	16,74 (10,78)	14,13 (9,95)	15,23 (10,30)	13,95 (10,70)
Profit consumer	18,69 (4,66)	18,16 (5,63)	20,48 (4,20)	19,17 (3,36)

Notes: The table reports means and standard errors (in parenthesis).

Table 2: Aggregated market outcomes

6.1   Aggregated market outcomes

Figure 1 shows the development of average production costs and prices over time. The values reported are calculated from all decisions made by producers regardless of whether their goods were bought by consumers or not. Production costs are stable over time in the transparency treatments but decrease in the no transparency treatments. Prices show a decreasing trend in all treatments. To account for this time trends I will control for "period" in later regression analysis.
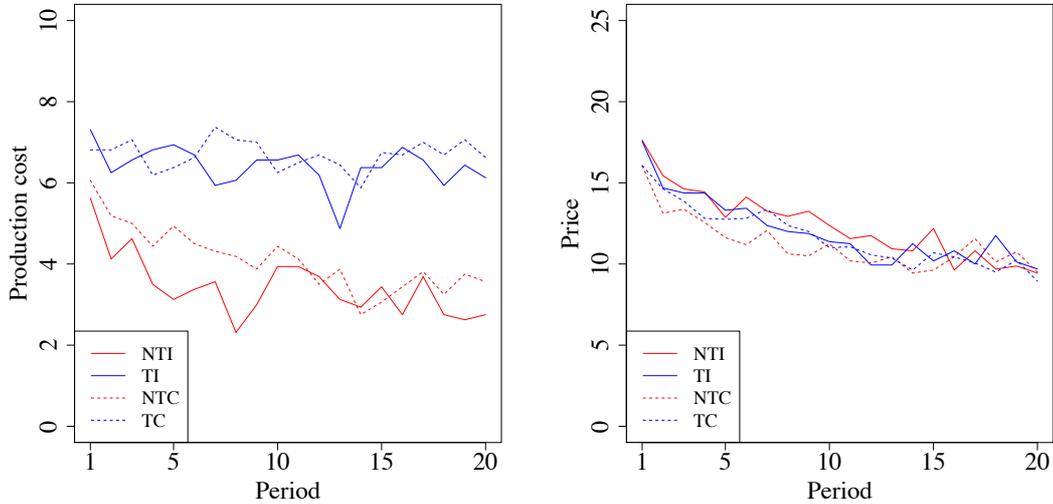
Figure 1: Development of production costs and prices over time

Table 2 provides an overview over the aggregated market outcomes. On average, producers spent positive production costs in all treatments. In the treatments without transparency the positive average production cost shows producers' willingness to forgo some profit for ethical production. The downward trend of prices over time seems to lower this willingness, but still, average production costs decreased only by roughly half the amount by which average prices decreased. Thus on average, producers cared about the

	NTI	TI	NTC	TC
Do not buy	4%	4%	1%	0%
Observations	320	320	640	640

Notes: The collective decision suggestions of each consumer in NTC and TC are treated as two separate decisions.

Table 3: Frequencies of consumers' decision to buy

ethical impact of production and spent money to avoid negative externalities to some extent even under price pressure. This contradicts expectations under standard assumptions of purely selfish preferences of producers which would predict production costs of 0.

Adding transparency had a large positive effect on production costs both with individual and collective buying decisions. This effect is highly significant (for this and all following MWU tests between treatments see Table 11 in the Appendix). Obviously, producers tried to make their goods attractive for consumers by increasing their production costs, and indeed, in the goods bought by consumers in the transparency treatments were on average produced with higher production costs than the rejected goods (Table 2). This also explains well why production costs remained stable over time in the transparency treatments even when average prices decreased.

The average prices of goods in all treatments were, on average, positively different from 0 and much higher than standard assumptions would predict. Prices were not significantly different between any treatments. On average, producers did not demand higher prices because of higher production cost in the transparency treatments as compared to the no transparency treatments. The price surplus over production cost therefore was, on average, higher in the no transparency treatments than in the transparency treatments. The difference, though, is only statistically significant between NTI and TC.

Altering the decision making process of consumers does not have a significant effect on average production cost. This confirms expectations concerning the no transparency treatments but contradicts expectations of higher production costs in TC than in TI. Increasing the market power of consumers does not force producers to produce more ethically.

Result 1: In contrast to predictions under standard assumptions producers, on average, spend positive production costs even without transparency. Production costs are even higher in the transparency treatments, confirming hypothesis 1b. They do not significantly differ between TI and TC which is in contrast to hypothesis 3b. Prices are not significantly different between any treatments which is in contrast to hypothesis 2b and 3b.

6.2 Consumers' propensity to refrain from buying a good

In my experiment, consumers could refrain from consumption. Table 3 gives an overview of how often this occurred in each treatment. In general, only few consumers refrained from

	Dependent variable:	
	Refrain from buying	
	NT	T
	(1)	(2)
Highest price	−0.035	0.022
	(0.033)	(0.021)
Highest production cost	−0.025	−0.267***
	(0.025)	(0.051)
Lowest price	0.147***	0.055
	(0.043)	(0.039)
Lowest production cost	−0.035	−0.015
	(0.040)	(0.025)
Collective	−0.626	−0.941*
	(0.511)	(0.483)
Period	0.012*	0.029
	(0.006)	(0.035)
Constant	−2.852***	−0.910
	(0.536)	(0.632)
Observations	640	640
Log Likelihood	-58.102	-45.549
Akaike Inf. Crit.	130.205	105.098

Notes: Probit regression. Robust standard errors in paren-
thesis, clustered by consumer subject number. ***$p < 0.01$,
**$p < 0.05$, *$p < 0.1$

Table 4: Propensity to refrain from buying a good

buying goods. Whereas in the individual decision treatments 4% of consumer decisions
were not to buy a good almost no consumers decided likewise in the collective decision
treatments. The difference, though, is only statistically significant between TI and TC.

To further analyze the dependencies of consumers' abstinence from consumption Table
4 presents a probit regression of consumers' propensity to refrain from buying a good on
the highest/lowest price and production cost of offered goods. Due to the low occurrence
of negative buying decisions in the collective decision treatments the regression analysis
includes a variable ("Collective") instead of a separate regression for these treatments.

In the no transparency treatments the lowest price on offer has a positive and significant
impact. Consumers were more likely to refrain from buying a good at all if both goods
were too expensive. This indicates that some consumers show concerns with respect to the
distribution of the market rent between themselves and the selling producer. They rather
forgo some profit than paying a price they consider unfair because it leaves the producer
with a too high share of the market rent. This is in line with findings from ultimatum
games in which offers by proposers that are too low are rejected by responders (Camerer,

2003, p. 43ff). Here, the moral considerations refer to consumers' own payoff in relation to others' payoff. Since the coefficient for the highest price is small and insignificant I find no evidence for attempts of consumers to punish producers they suspect of unethical production because of too low prices. Also, collective decision making does not have a significant influence on consumers' propensity to refrain under no transparency.

The picture changes when looking at the results for the transparency treatments. Here, neither lowest nor highest price has a significant influence on consumers' propensity to refrain from buying a good. The only product characteristic that has a significant influence is the highest production cost on offer. The negative coefficient means that consumers tend to refrain from consumption if the highest production cost on offer is low. This represents a shift of moral focus from consumers' own relative payoff level to the level of production cost they consider appropriate and thus to an external effect that does not have an impact on themselves.

Surprisingly, collective buying decision making has a significant negative impact under transparency. This strongly contrasts expectations. It was assumed that consumers are more willing to refrain from buying goods if they do so collectively. Inequality concerns of consumers with respect to other consumers' payoff were expected to decrease the expression of values in individual buying decisions and especially decrease the willingness to punish producers. Yet, if anything, consumers are more likely to refrain from buying goods in the individual decision treatments where they have no reassurance of equal behavior of the other consumer. A possible explanation is that consumers shy away from imposing their own values on others if this includes forgoing a substantial amount of money. This relates to the finding that people are more likely to violate ethical norms if they share benefits from doing so with others (Gino et al., 2013; Wiltermuth, 2011).

Result 2: Consumers' propensity to refrain from consumption does not differ between no transparency and transparency treatments which is in contrast to hypothesis 2a. A significant difference can be found between TI and TC but in the opposite direction than expected and thus in sharp contrast to hypothesis 3a.

6.3 Consumers' preferences for price and production cost

Next, I analyze consumers' sensitivity to price and production cost differences. Table 5 presents break downs of consumer decisions.[2] The upper section of the table shows consumers' decisions with respect to price differences. In the no transparency treatments about 80 % of consumers decided to buy the cheaper good and thus maximize their profit. There seems to be not much difference between NTI and NTC which was expected. In the transparency treatments a lower share of consumers bought the cheaper good which shows that consumers do react to the information about production costs spent on the goods on offer. Since it occurs more often that there is no difference in prices in TC than in TI the difference in the share of consumers who decide to buy cheap does not seem

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[2]A full overview of consumer decisions is provided in Table 14 in the Appendix.

	NTI	TI	NTC	TC
No difference in prices	9%	3%	9%	13%
Buy cheap	82%	67%	80%	61%
Buy expensive	6%	26%	11%	26%
Do not buy	3%	4%	0%	0%
Observations	320	320	320	320
No difference in production cost	(13%)	16%	(11%)	11%
Buy ethically	(38%)	52%	(42%)	59%
Buy unethically	(46%)	30%	(47%)	30%
Do not buy	(3%)	2%	(1%)	0%
Observations	320	320	320	320
No difference in price or production cost	(19%)	18%	(18%)	21%
Buy cheap and unethically	(42%)	30%	(40%)	30%
Buy expensive and ethically	(2%)	26%	(6%)	26%
Do not buy	(2%)	2%	(0%)	0%
Buy cheap and ethically	(32%)	23%	(32%)	23%
Buy expensive and unethically	(2%)	0%	(4%)	0%
Do not buy	(1%)	0%	(0%)	0%
Observations	320	320	320	320

Notes: In NTC and TC frequencies are calculated only from the suggestions about which offer to buy for oneself.

Table 5: Frequencies of buying cheap and buying ethically

large between these two treatments.

The middle section of Table 5 shows consumers decisions with respect to the differences in production costs. In the no transparency treatments where consumers could only guess about the production cost, about 45 % of buying decisions are made in favor of the more unethical good. Again, there is no big difference between NTI and NTC. In the transparency treatments this share decreases to 30 %. There is also no difference between TI and TC. This is surprising since it was assumed, that collective buying decisions under transparency would increase consumers' tendency to buy more expensive and more ethically produced goods. Therefore, I look deeper into the different decision types consumers faced depending on price and production cost differences of offered goods in the lower part of Table 5. When both offers differed in price and production cost consumers faced one of two possible decisions. If the cheaper good also included lower production cost than the more expensive good the decision was to be made between buying cheap and unethically and buying expensive and ethically. If the cheaper good was produced with higher production cost than the more expensive good the decision was to be made between buying cheap and ethically and buying expensive and unethically. Only in the transparency treatments consumers knew which of the two decision problems they were facing.

30 % of informed consumers choose to buy a cheaper and unethical good over an expensive and ethical good. This equates to just over 50 % of all cases where consumers

	Dependent variable:			
	Decision to buy offer 1			
	NTI	TI	NTC	TC
	(1)	(2)	(3)	(4)
Price difference	0.307**	0.271***	0.155**	0.319***
	(0.123)	(0.039)	(0.071)	(0.051)
Production cost difference	0.016	−0.222***	−0.009	−0.220***
	(0.028)	(0.040)	(0.017)	(0.039)
Period	0.004	−0.008	−0.013	0.023
	(0.013)	(0.014)	(0.012)	(0.015)
Constant	0.043	−0.001	0.236*	−0.016
	(0.219)	(0.173)	(0.134)	(0.212)
Observations	320	320	320	320
Log Likelihood	-127.796	-150.367	-156.921	-139.615
Akaike Inf. Crit.	263.592	308.733	321.842	287.229

Notes: Probit regression. Robust standard errors in parenthesis, clustered by consumer subject number. In NTC and TC only observations from the decision which good to buy for oneself are included. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Table 6: Propensity to buy offer 1

face this decision problem. In the remaining just under 50 % of the cases consumers depart from the strategy of profit maximization and buy a more unethically produced good at a higher price. Still, no difference can be found between TI and TC.

The offers of both producers of a group where randomly ranked and offered to the consumers of the group as offer 1 and 2. Hence, offer 1 and offer 2 did not differ systematically.[3] For further analysis Table 6 presents results of a probit regression of the propensity of a consumer to buy offer 1.[4] The price difference is calculated as price of offer 2 minus price of offer 1. The production cost difference is calculated as production cost of offer 2 minus production cost of offer 1.

In all treatments, the coefficient for Price difference is positive and significant. This means that the propensity to buy offer 1 significantly increased the lower its price relative to offer 2 is. It shows that consumers, on average, had a preference for the cheap goods over all treatments. Although no differences were expected in the no transparency treatments the effect size is significantly smaller in NTC than in NTI (z-value from Wald test: 19,82). A comparison of price differences shows that this is not due to a different distribution of price differences between these two treatments (see Table 11 and Figure 6 in the Appendix). In fact, if anything, price differences were larger in the NTC treatment which should lead

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[3]WSR test on the differences in price between offer 1 and offer 2 over all treatments: p = 0,26; WSR test on differences in production cost between offer 1 and offer 2 in the transparency treatments: p = 0,23.

[4]Apart from small distortions from the few decisions to refrain from buying goods, regressions on the decisions to buy offer 1 and offer 2 mirror each other. For the regression on the decision to buy offer 2 see Table 12 in the Appendix.

to a higher price sensitivity of consumers. Therefore, the difference in the price difference coefficients between NTI and NTC in Table 6 can be interpreted as a lower reluctance of consumers to buy expensive goods with collective decisions. But why do we find this effect only under no transparency? (Wang et al., 2014) showed that higher cognitive load through calculative tasks can crowd out social and moral concerns. This finding could serve as an explanation here. In NTC consumers based their decisions on the simple comparison of two prices and their beliefs about what the corresponding production costs might be. The ethical impact of their buying decision stayed vague and could not be numbered. In TC consumers could compare prices, production costs and markups of prices over production costs which clearly required more calculation and thus lowered moral concerns.

Production cost difference did not have a significant influence in the no transparency treatments. This is not surprising since consumers did not know about production costs and hence could not calculate their difference. It confirms the result from the analysis of consumers' decisions not to buy which was, that consumers do not find an effective strategy for how to infer from the prices of the goods on offer to which of them is the more ethically produced good. In the transparency treatments the production cost difference had a highly significant negative effect. The coefficients are very similar in TI and TC. Since there is no significant difference between the production cost differences of these two treatments the coefficients seem comparable.

Because consumers in the transparency treatments cared for both, price and production cost, I examine how they traded off price differences versus production cost differences of the offered goods when the buying decision was to be made between buying cheap and unethically and buying expensive and ethically. Table 7 presents the means of price and cost differences conditional on how consumers decided in these situations and results of a MWU test comparing these decisions. Consumers, on average, were more likely to buy expensive and ethical goods if the price difference was small. This is true in both TI and TC. Looking at production cost differences consumers, on average, bought expensive and ethical goods if the difference was high. This effect is only statistically significant in the TC treatment. Therefore, consumers were more consistent in buying more ethical goods at higher price if production cost differences between offers were high with collective decisions. However, this did not result in an overall significantly higher production cost sensitivity of consumers.

Result 3: Overall, consumers more often bought expensive goods and more ethically produced goods in the transparency treatments which supports hypothesis 1a and 2a. They buy expensive and ethically produced goods if the price surplus is not too high. Although consumers seem to be more consistent in buying expensive and ethically produced goods when production cost differences are high in TC than in TI no clear evidence can be found for a significantly higher tendency to buy more expensive and ethically produced goods in TC than in TI. Thus, hypothesis 3a cannot be confirmed.

	NTI	TI	NTC	TC
Mean price difference				
Buying expensive and ethical		3,99 (2,94)		3,23 (2,25)
Buying cheap and unethical		5,86 (3,58)		4,12 (2,54)
p-value MWU test		[0,0139]		[0,0123]
Buying expensive	3,78 (3,08)		4,78 (3,75)	
Buying cheap	4,33 (4,05)		5,65 (4,98)	
p-value MWU test	[0,8789]		[0,9237]	
Mean production cost difference				
Buying expensive and ethical		6,25 (2,95)		6,20 (2,75)
Buying cheap and unethical		5,40 (3,27)		4,74 (2,86)
p-value MWU test		[0,1714]		[0,0032]

Notes: The table reports means, standard errors (in parentheses) and p-values of MWU tests with robust standard errors clustered by subjects [in brackets]. The collective decision suggestions of each consumer in NTC and TC are treated as two separate decisions.

Table 7: Means of offer differences in selected decisions

6.4   Consumer expectations

Since consumers were asked about their expectations of the other consumer's buying decision, I can analyze the buying decisions conditional on expectations. Table 8 presents break downs of expectations and conditional buying decisions.[5] Overall, expectations did not differ much between treatments in a surprising way. Looking at the conditional buying decisions though reveals an interesting tendency. The rows marked with dashed lines report the percentage numbers of cases where expectations and buying decisions were in accordance. In general, these percentage numbers were high and consistently even larger in the collective decision treatments. Especially since in these treatments consumers had one additional option (buy both), the adherence of their buying decisions to their stated expectations seems bigger than in the individual decision making treatments.

These results are supported by the regression reported in Table 9. It replicates the regression model from Table 6 and adds consumer's expectation about the other consumer's decision regarding offer 1 as independent variable. "Expect other consumer to buy offer 1" is a dummy variable that is 1 if a consumer expected the other consumer to buy (or suggest to buy in the collective decision treatments) at least one good from offer 1 and no good from offer 2.[6] In all treatments, the expectation variable has a highly significant and positive coefficient which confirms, that expectations about the other consumer's behavior are a strong predictor of a consumer's buying decision. Since the coefficients are even larger in the collective decision treatments (z-values from Wald tests: NTI vs. NTC: 18,60; TI vs.

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[5]A complete overview over expectations and conditional buying decisions is provided in Table 15 and Table 16 in the Appendix.

[6]Because this could be criticized as an arbitrary specification Table 13 in the Appendix reports the same regression with the value of the expectation variable being 1 if the other consumer was expected to buy at least one good from offer 1 regardless the expectations about her buying offer 2. This variation does not yield different results.

	NTI	TI	NTC	TC
Equal price	9%	3%	9%	13%
Expect buying cheap	77%	73%	80%	62%
Buy cheap	96%	82%	94%	87%
Buy expensive	4%	16%	3%	8%
Do not buy	0%	2%	0%	1%
Buy both	-	-	3%	5%
Expect buying expensive	9%	22%	5%	16%
Buy cheap	72%	32%	0%	6%
Buy expensive	28%	63%	71%	84%
Do not buy	0%	4%	0%	0%
Buy both	-	-	29%	10%
Expect buying not	6%	2%	0%	0%
Expect buying both	-	-	6%	10%
Observations	320	320	320	320
Equal production cost	13%	16%	11%	11%
Expect buying unethically	(42%)	36%	(42%)	31%
Buy unethically	(91%)	65%	(94%)	73%
Buy ethically	(9%)	35%	(2%)	17%
Do not buy	(0%)	0%	(0%)	1%
Buy both	(-)	-	(4%)	9%
Expect buying ethically	(39%)	46%	(38%)	48%
Buy unethically	(17%)	14%	(3%)	2%
Buy ethically	(82%)	84%	(90%)	95%
Do not buy	(1%)	3%	(0%)	0%
Buy both	(-)	-	(8%)	3%
Expect buying not	(5%)	2%	(0%)	0%
Expect buying both	(-)	-	(10%)	10%
Observations	320	320	320	320
Equal price or equal production cost	19%	18%	18%	21%
Expect buying cheap and unethically	(38%)	35%	(39%)	31%
Buy cheap and unethically	(98%)	66%	(95%)	74%
Buy expensive and ethically	(2%)	34%	(2%)	15%
Do not buy	(0%)	0%	(0%)	1%
Buy both	(-)	-	(2%)	9%
Expect buying expensive and ethically	(6%)	21%	(3%)	16%
Buy cheap and unethically	(79%)	29%	(0%)	6%
Buy expensive and ethically	(21%)	66%	(60%)	84%
Do not buy	(0%)	4%	(0%)	0%
Buy both	(-)	-	(40%)	10%
Expect buying cheap and ethically	(30%)	23%	(33%)	23%
Expect buying expensive and unethically	(3%)	1%	(2%)	0%
Expect buying not	(5%)	2%	(0%)	0%
Expect buying both	(-)	-	(6%)	10%
Observations	320	320	320	320

Notes: Blocks of rows with ident amount to 100% and are break downs of the observations belonging to the next row without ident above the block. The very rare cases in which a consumer suggested to collectively buy only one good are here treated the same as if two of the same good would have been suggested. This is also true for stated expectations of the other consumer's suggestion.

Table 8: Expectations and buying decisions

	Dependent variable:			
	Propensity to buy offer 1			
	NTI	TI	NTC	TC
	(1)	(2)	(3)	(4)
Price difference	0.181	0.198***	0.065	0.198***
	(0.117)	(0.047)	(0.044)	(0.047)
Production cost difference	0.029	−0.176***	−0.018	−0.176***
	(0.030)	(0.043)	(0.014)	(0.040)
Expect other consumer to buy offer 1	1.554***	0.841***	2.201***	1.618***
	(0.495)	(0.288)	(0.377)	(0.330)
Period	0.001	−0.012	−0.012	0.010
	(0.011)	(0.014)	(0.013)	(0.020)
Constant	−0.714***	−0.355*	−0.619***	−0.578*
	(0.267)	(0.210)	(0.207)	(0.316)
Observations	320	320	320	320
Log Likelihood	-101.842	-141.293	-103.619	-108.663
Akaike Inf. Crit.	213.684	292.587	217.238	227.326

Notes: Probit regression. Robust standard errors in parentheses, clustered by consumer subject number. ***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 9: Propensity to buy offer 1 with expectations about the other consumer's behavior

TC: 31,73) the regression also confirms, that decisions in the collective decision treatments were more dependent on expectations than in the individual decision treatments. This was not expected. It was assumed that consumers would decide more independently from their expectations of others' behavior with collective decisions. Rather than using their market power to shape the collective buying decision according to their own ethical values, consumers seem to consider their beliefs about the other consumer's preferences when they have to decide for both of them. This again confirms that consumers are reluctant to impose their own values on others.

The coefficients for the expectation variable are also larger in the no transparency treatments than in the transparency treatments (z-values from Wald tests: NTI vs. TI: 22,27; NTC vs. TC: 20,82). An explanation for this can be derived from looking at the price and production cost difference variables. The effect of price difference looses its significance as compared to the model without expectations in the no transparency treatments. Thus, there is no significant influence of price differences independent from expectations of other consumers' behavior without transparency. This is different in the transparency treatments. Price and production cost difference keeps a significant effect on the buying decision which means that they have a significant influence that is independent from expectations. Thus, informing consumers about production costs leads to a more independent judgement and buying decision.

Result 4: Consumers make their decisions more dependent on their expectations of

	Dependent variable:			
	Producer profit			
	NTI	TI	NTC	TC
	(1)	(2)	(3)	(4)
Price	−0.872***	−0.511***	−0.206***	−0.748***
	(0.140)	(0.152)	(0.074)	(0.137)
Cost	−0.949***	0.386**	−1.112***	0.292**
	(0.159)	(0.182)	(0.133)	(0.129)
Period	−0.525***	−0.426***	−0.239***	−0.475***
	(0.103)	(0.103)	(0.068)	(0.081)
Constant	36.326***	22.273***	24.438***	25.848***
	(2.454)	(2.209)	(1.365)	(2.052)
Observations	320	320	640	640
R^2	0.237	0.061	0.124	0.063
Adjusted R^2	0.230	0.052	0.119	0.058

Notes: OLS regression. In the collective decision treatments also the suggestions of consumers that where not realized are included here. Observations from these suggestions were obtained by calculating hypothetical profits for producers. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 10: Producer profit

other consumers' behavior in the collective decision treatments. They do not consistently use market power to influence production conditions, but are concerned about imposing their own values upon others.

6.5 Profitability of production

The market structure of the experiment allows for examining which choices of producers resemble a profitable production. Table 10 shows that, on average, increasing the price has a strong and significant negative effect on producer profit. This means that the decrease in demand for a good due to a higher price (see Table 6) outweighs the additional profit from a higher price in case producers sell a good. The relatively low coefficient in NTC fits the lower consumer sensitivity to price differences for this treatment reported in Table 6. Producers turned out to be overly reluctant to set lower prices although this would have been profitable. This can partly be explained when looking at markups of price over production cost. Table 4 in the Appendix reports the frequencies of markups. It shows that almost no producers chose a price lower than the production cost spent. Especially in the transparency treatment in which markups were, on average, lower, this seems to be a fairness threshold producers were not willing to cross.

The effect of production cost on profit is significantly negative and close to one. So, on average, the producer's profit was reduced by the full amount of the production cost. This is not surprising, since we know already that consumers could not infer from price to pro-

duction cost and thus could not consistently buy more ethical goods. In the transparency treatments we see an opposite effect. Production cost, on average, has a significant profit enhancing effect. This means, that under transparency the profit from an increased demand for a good through ethical production was larger than the direct profit reduction from the production cost spent.

Result 5: Whereas ethical production reduces producers' profit in the no transparency treatments it pays off in the transparency treatments because of a demand increasing effect of high production costs. Producers are reluctant to lower prices although the increased demand, on average, makes up for the lower price.

7   Discussion and Conclusion

This thesis analyzes the potential impact of ethical consumerism on market outcomes in a laboratory market game. The treatments vary transparency concerning the ethical level of production conditions and consumer market power through the introduction of collective buying decisions.

The results of the experiment show that transparency about production conditions has a big potential to increase the level of ethical production. Whereas only few consumers buy expensive products when there is no transparency - although they know that cheap production entails negative externalities - a substantial share of consumers buy ethically produced goods in the transparency treatments if the price premium is not too high. Producers react to consumers' preferences and inflict a significantly lower level of negative externalities through production. This confirms expediency of regulations that demand transparency about production processes to mitigate negative externalities from unethical production.

It was assumed that because of inequality aversion with respect to other consumers' payoff consumers refrain from ethical consumerism in the individual decision treatment. Although this cannot be ruled out I find no evidence that consumers buy more ethically if they yield market power. Rather, it seems that consumers are more concerned about what other consumers would do if they decide on their behalf. They are reluctant to impose their own values on others. The results do not confirm the notion that consumers pursue a strategy to influence producers' future behavior through their buying decision. This finding is in contrast to results from questionnaires where consumers state that they are considerate about the efficacy of their purchase decision and other consumers' behavior (e.g. Gupta and Ogden, 2009). A reason might be the lack of a collectively shared reference point that distinguishes between ethical and unethical production. This difference to a consumer boycott scenario could be the reason why consumers do not use their market power to promote ethical production. It implies that normative judgements about what it means to consume ethically could be a useful tool for promotion of ethical consumerism. To investigate this further is a topic for future research.

It is especially noteworthy that the effect of production cost on producer profit changes

substantially with the introduction of transparency about production conditions. While spending higher production costs to ensure ethical production naturally decreases producers profit if there is no transparency it increases producers profit on average under transparency conditions where consumers know about production conditions. Thus, ethical production can be profitable in a competitive market. This finding is in line with previous research (Pigors and Rockenbach, 2016; Bartling et al., 2015) and should encourage firms to strengthen transparency and ethical production as key characteristics in their differentiation strategy.

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Appendix

## Appendix A - Figures

NTI

NTC

TI

TC
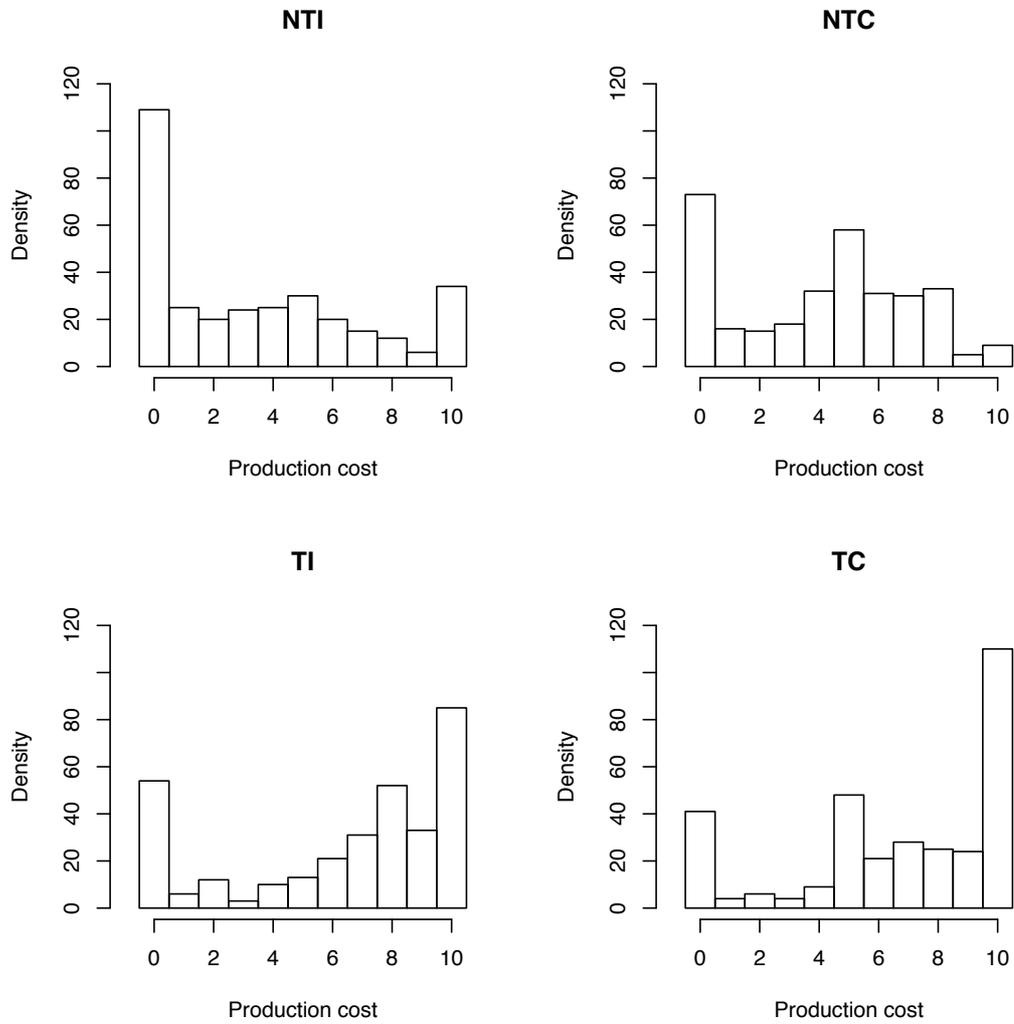
Figure 2: Production costs of goods offered
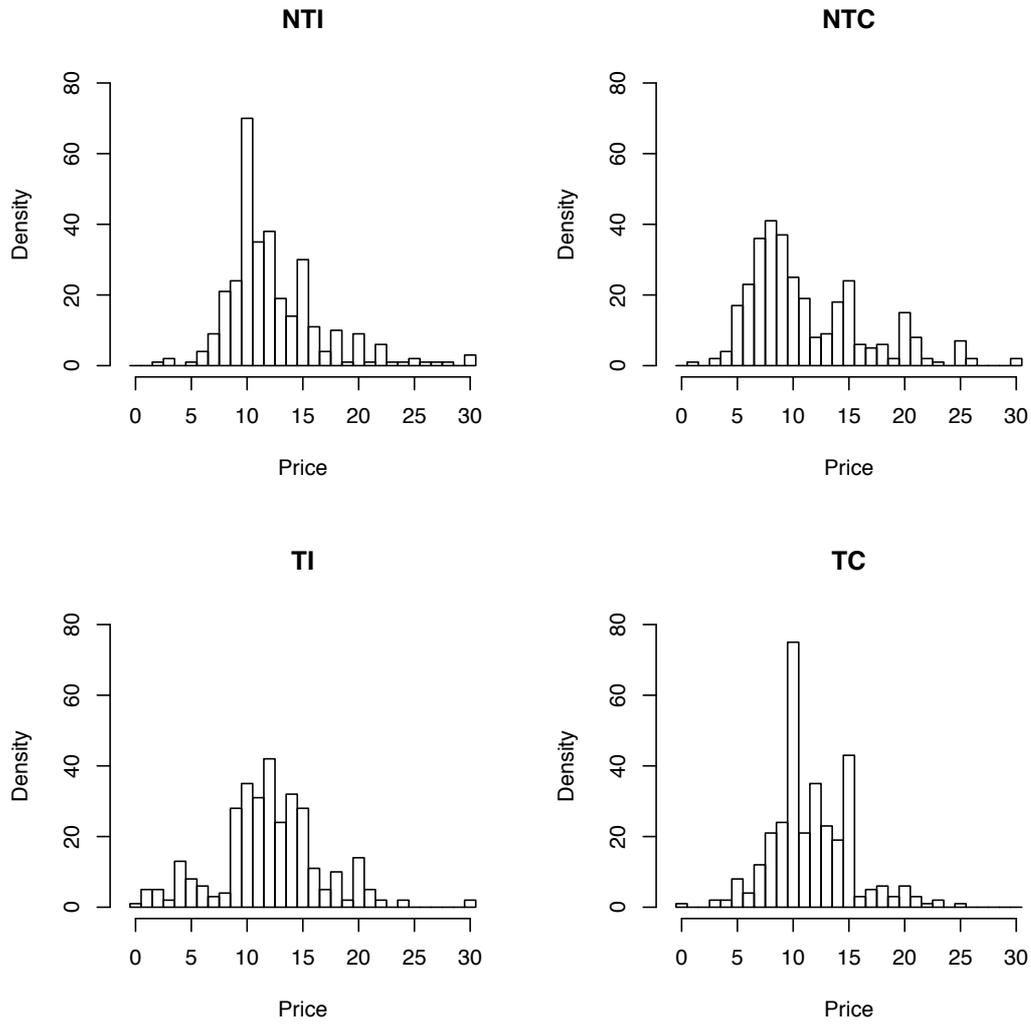
Figure 3: Prices of goods offered
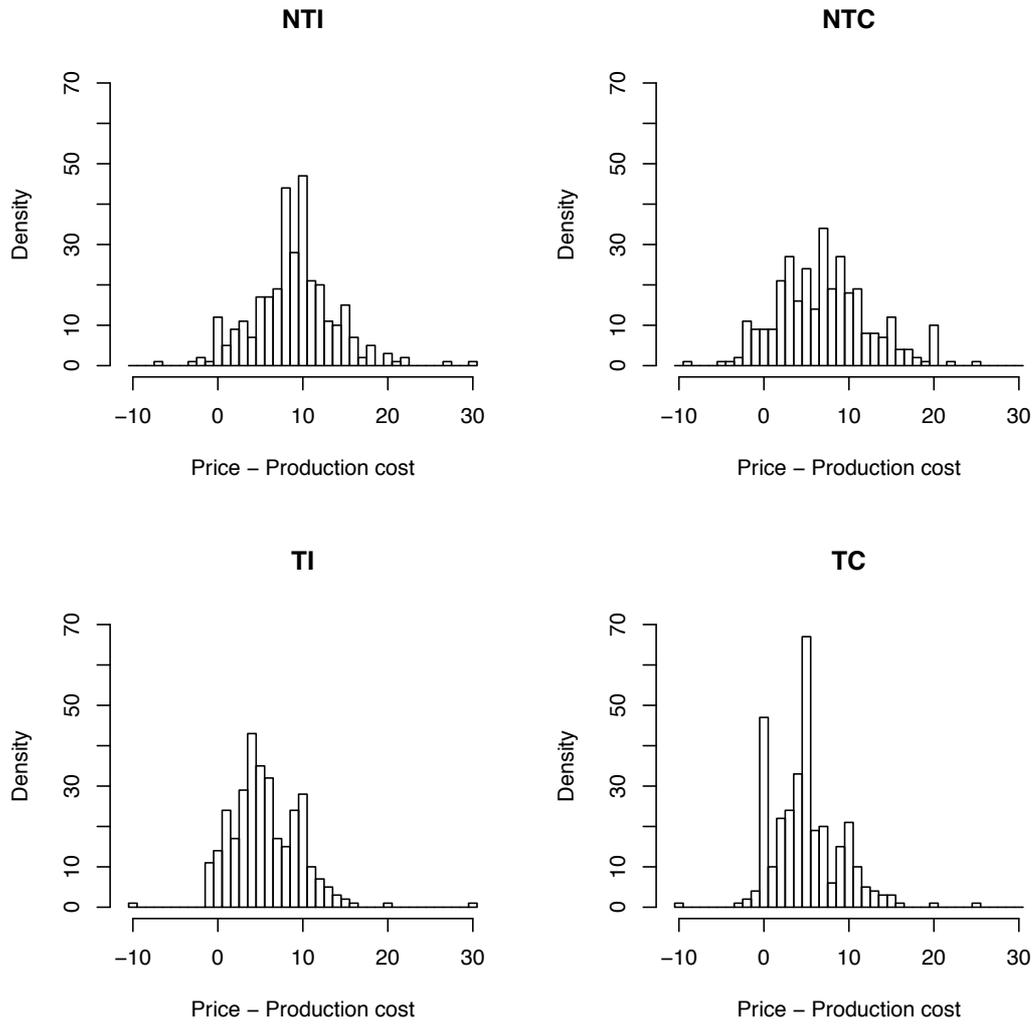
Figure 4: Markup of price over production costs of goods offered
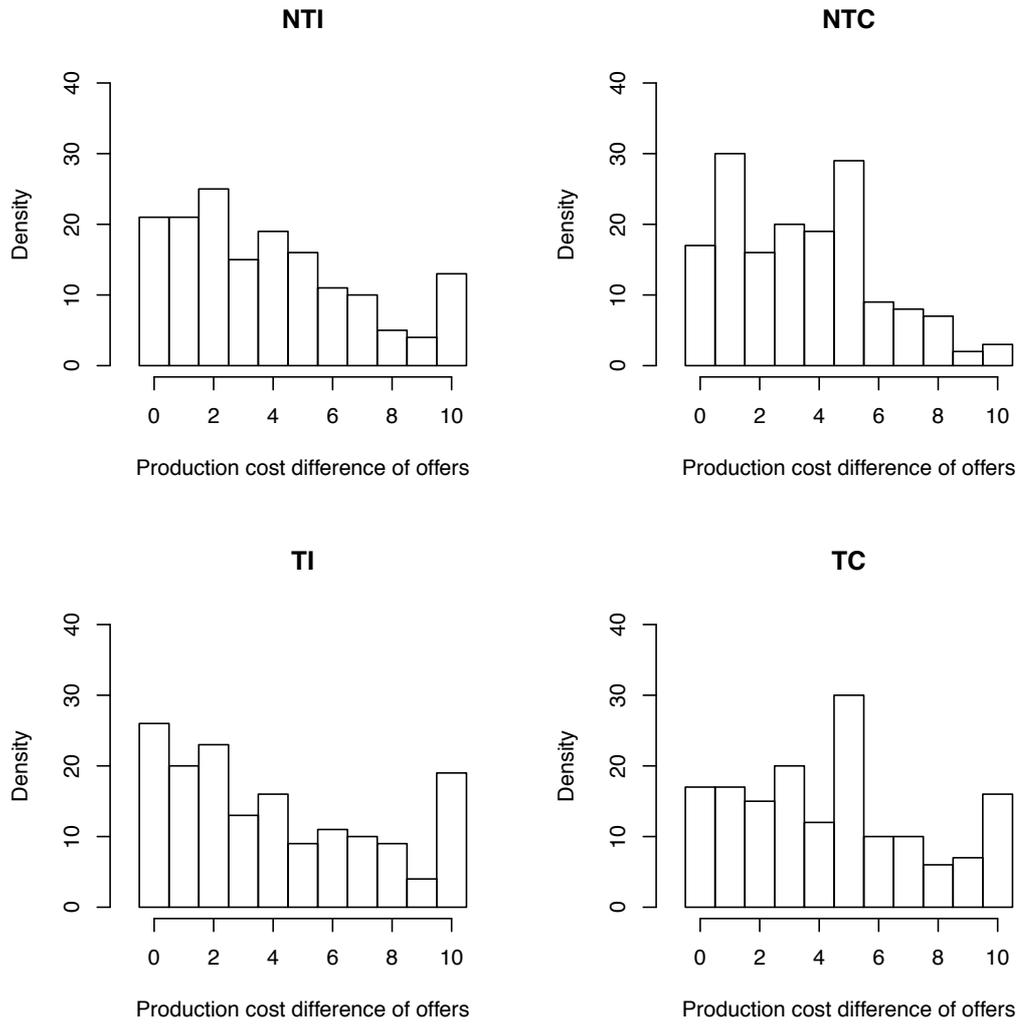
Figure 5: Production cost differences of offers in groups
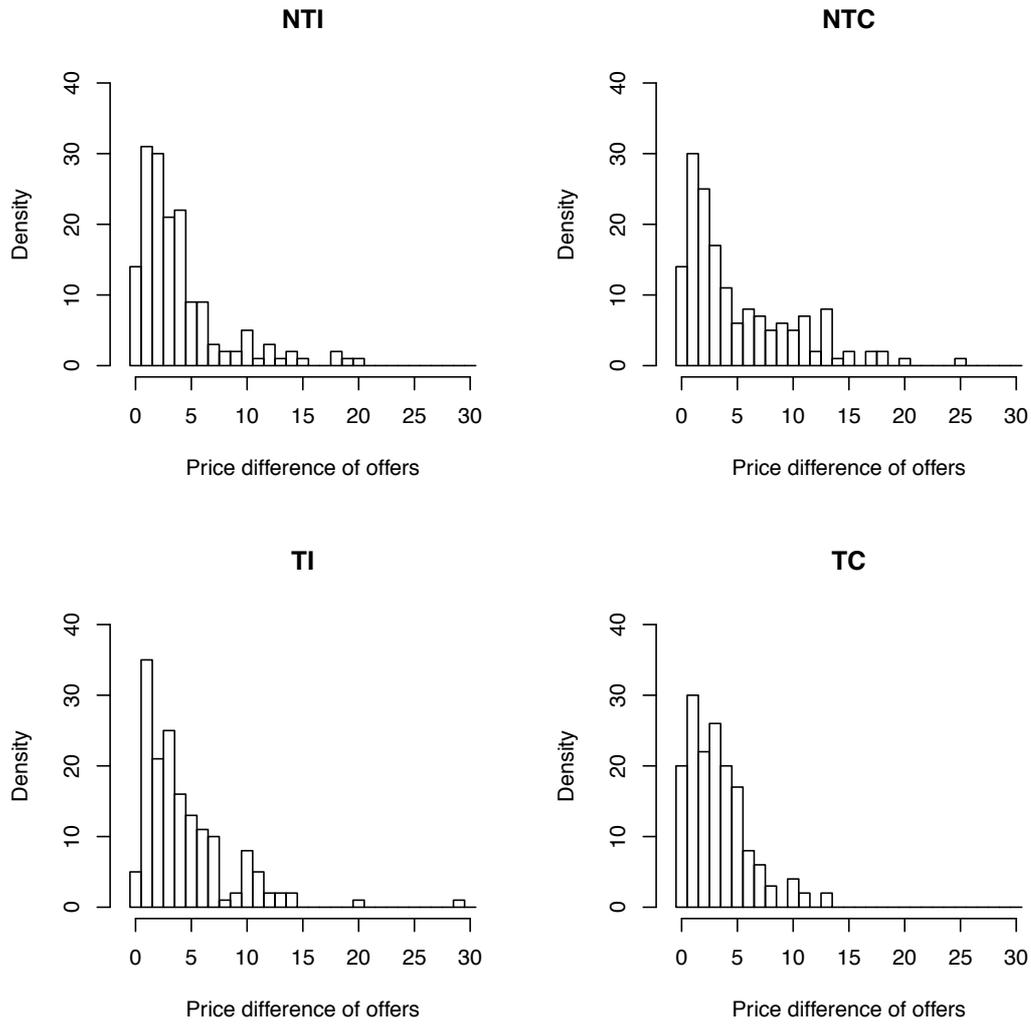
Figure 6: Price differences of offers in groups
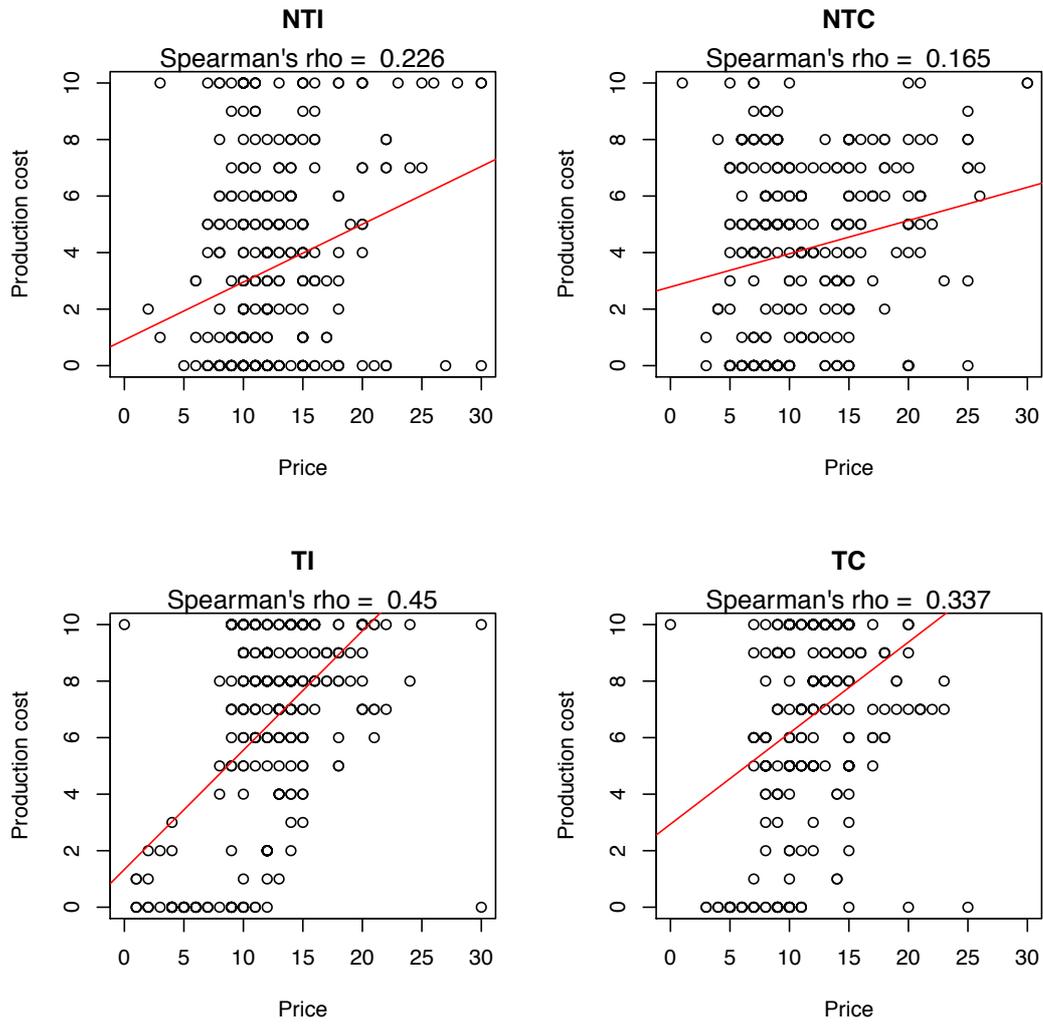
Figure 7: Scatterplot of price and production cost of goods offered with regression line
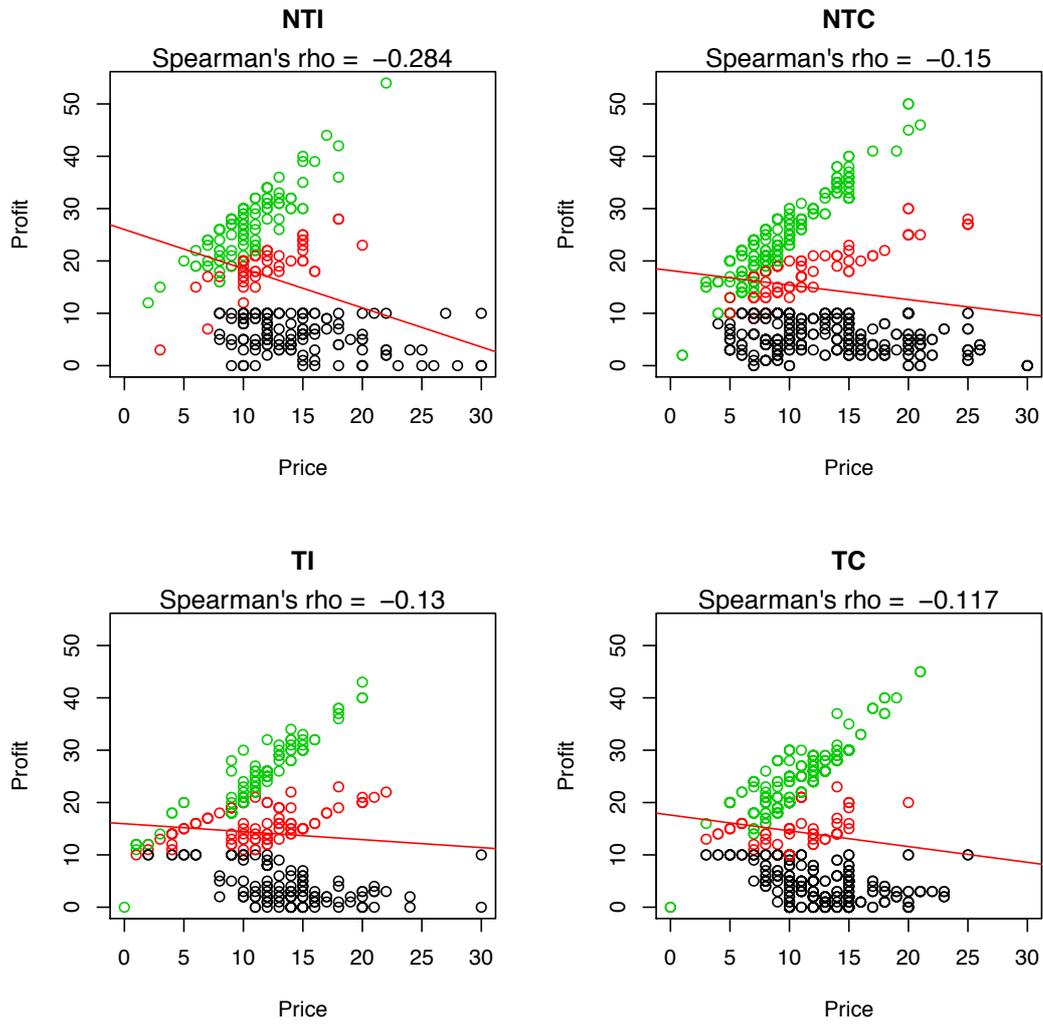
Figure 8: Scatterplot of price set and profit of producers with regression line

Colors indicate the number of buyers
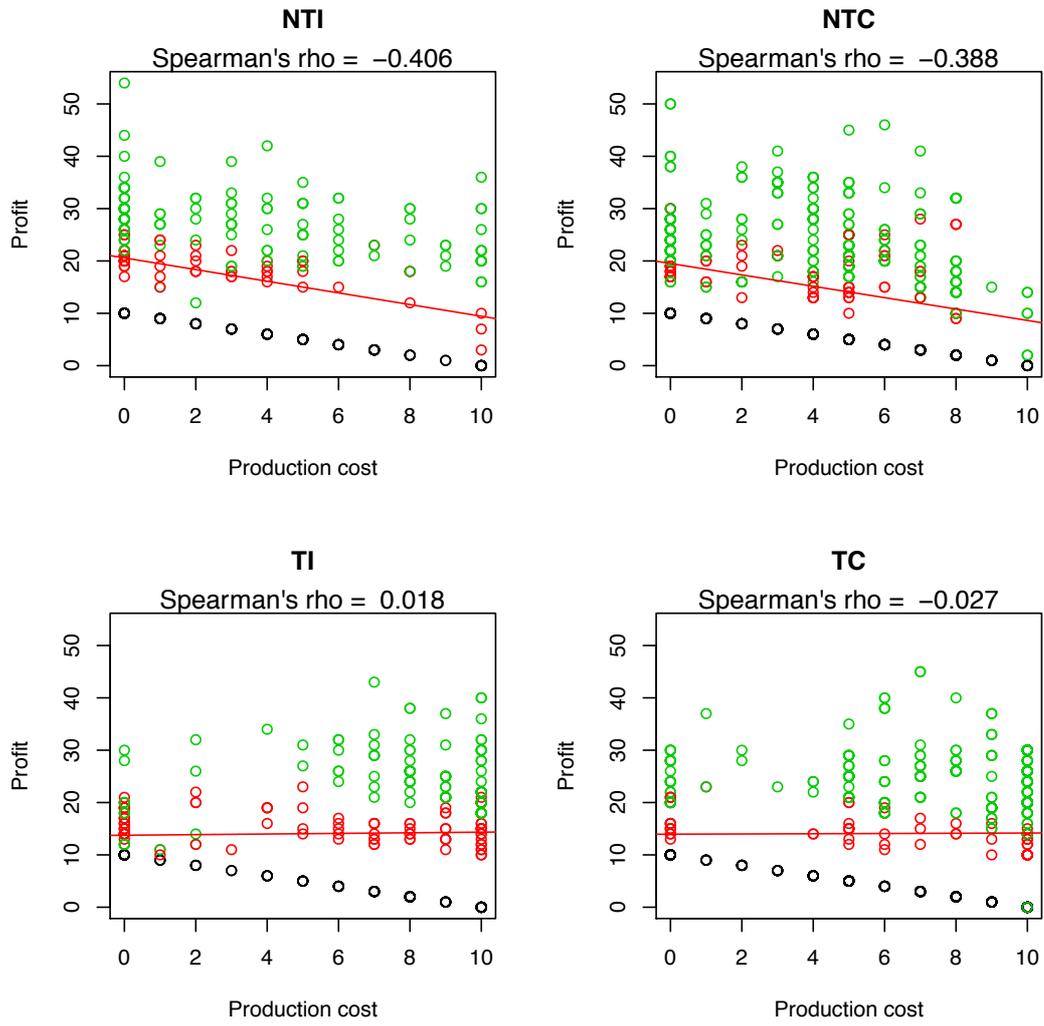
Figure 9: Scatterplot of production cost set and profit of producers with regression line

Colors indicate the number of buyers

Appendix B - Tables

|	NTI	TI	NTC	TC
Production cost	3,44 (3,44)	6,41 (3,63)	4,10 (2,97)	6,69 (3,42)
Production cost difference	3,84 (3,00)	4,05 (3,34)	3,48 (2,50)	4,41 (3,06)
Price	12,38 (4,35)	12,01 (4,69)	11,23 (5,31)	11,66 (3,66)
Price difference	3,90 (3,96)	4,41 (4,04)	5,06 (4,91)	3,24 (2,71)
Price surplus	8,94 (4,80)	5,61 (4,08)	7,12 (5,51)	4,97 (4,06)
Profit producer	16,74 (10,78)	14,13 (9,95)	15,23 (10,30)	13,95 (10,70)
Profit consumer	18,69 (4,66)	18,16 (5,63)	20,48 (4,20)	19,17 (3,36)
Do not buy	3,75%	4,38%	0,31%	0,31%
Buy cheap	93,59%	71,81%	84,59%	67,74%
Buy ethically	44,94%	63,22%	41,40%	60,00%

	Transparency Effect		Collective decision effect		Cross comparison	
	NTI vs. TI	NTC vs. TC	NTI vs. NTC	TI vs. TC	NTI vs. TC	TI vs. NTC
Production cost	0,0141	0,0095	0,3937	0,8063	0,0061	0,0162
Production cost differences	0,9130	0,0593	0,5236	0,3111	0,2305	0,4347
Price	0,8300	0,2756	0,1041	0,5735	0,5599	0,2533
Price difference	0,2527	0,0405	0,1233	0,1040	0,5560	0,5647
Price surplus	0,0051	0,1416	0,1696	0,4915	0,0019	0,3102
Profit producer	0,0377	0,2935	0,2670	0,9083	0,0225	0,3898
Profit consumer	0,1407	0,0095	0,0050	0,2229	0,8741	0,0110
Do not buy	0,8782	1,0000	0,3183	0,0929	0,3183	0,0929
Buy cheap	0,0039	0,0596	0,3622	0,9344	0,0026	0,0682
Buy ethically	0,0122	0,0134	0,2805	0,9942	0,0057	0,0358

Notes: The upper part of the table reports means and standard errors (in parenthesis) or percentages. The lower part reports p-values of MWU tests, clustered by subject ID.

Table 11: Equality tests

		Dependent variable:		
		Decision to buy offer 2		
	NTI	TI	NTC	TC
	(1)	(2)	(3)	(4)
Price difference	0.269**	0.179**	0.156**	0.322***
	(0.106)	(0.091)	(0.071)	(0.052)
Cost difference	−0.003	−0.155**	−0.011	−0.223***
	(0.026)	(0.064)	(0.016)	(0.040)
Period	0.010	−0.008	0.013	−0.022
	(0.014)	(0.016)	(0.012)	(0.015)
Constant	−0.385*	−0.017	−0.261**	−0.016
	(0.229)	(0.170)	(0.127)	(0.221)
Observations	320	320	320	320
Log Likelihood	-134.009	-167.251	-156.512	-138.472
Akaike Inf. Crit.	276.019	342.502	321.023	284.944

Notes: Probit regression. Robust standard errors in parenthesis, clustered by consumer subject number. In the collective decision treatments only observations from which good to buy for oneself are included. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 12: Propensity to buy offer 2

		Dependent variable:		
		Propensity to buy offer 1		
	NTI	TI	NTC	TC
	(1)	(2)	(3)	(4)
Price difference	0.181	0.198***	0.041	0.218***
	(0.117)	(0.047)	(0.043)	(0.037)
Production cost difference	0.029	−0.176***	0.014	−0.172***
	(0.030)	(0.043)	(0.021)	(0.043)
Expect other consumer to buy offer 1 (all)	1.554***	0.841***	2.412***	1.710***
	(0.495)	(0.288)	(0.431)	(0.289)
Period	0.001	−0.012	−0.001	0.008
	(0.011)	(0.014)	(0.008)	(0.023)
Constant	−0.714***	−0.355*	−1.323***	−0.952***
	(0.267)	(0.210)	(0.310)	(0.351)
Observations	320	320	320	320
Log Likelihood	-101.842	-141.293	-95.506	-103.859
Akaike Inf. Crit.	213.684	292.587	201.012	217.719

Notes: Probit regression. Robust standard errors in parenthesis, clustered by consumer subject number. In the collective decision treatments only observations from which good to buy for oneself are included. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 13: Propensity to buy offer 1 with expectations about the other consumer's behavior, robustness check

	NTI	TI	NTC single	TC single	NTC all	TC all
Buy	308	306	318	319	637	638
Buy cheap	263	214	256	196	515	403
Buy ethically	102	75	103	74	207	148
Buy unethically	135	96	127	96	254	203
Equally ethical	26	43	26	26	54	52
Buy expensive	18	84	36	83	69	155
Buy ethically	7	84	19	83	38	155
Buy unethically	5	0	13	0	25	0
Equally ethical	6	0	4	0	6	0
Equal price	27	8	26	40	53	80
Buy ethically	11	6	13	32	25	64
Buy unethically	7	0	9	0	20	0
Equally ethical	9	2	4	8	8	16
Do not buy	12	14	2	1	3	2
Different price	11	12	0	1	0	2
Expensive & ethical vs. cheap & unethical	6	6	0	1	0	2
Expensive & unethical vs. cheap & ethical	5	1	0	0	0	0
Equally ethcial	0	5	0	0	0	0
Equal price	1	2	2	0	3	0
Differently ethical	0	0	2	0	3	0
Equally ethcial	1	2	0	0	0	0
Observations	320	320	320	320	640	640

Notes: Accumulated observations. The columns "NTC single" and "TC single" only count observations from The collective decision suggestions of each consumer in NTC and TC are treated as two separate observations.

Table 14: Buying decisions

	NTI	TI	NTC	TC
Equal price	28	10	28	40
Expect buying cheap	245	233	256	198
Buy cheap	234	190	241	173
Buy expensive	10	38	7	15
Do not buy	1	5	0	1
Buy both	-	-	8	9
Expect buying expensive	29	71	17	50
Buy cheap	21	23	0	3
Buy expensive	8	45	12	42
Do not buy	0	3	0	0
Buy both	-	-	5	5
Expect buying not	18	6	0	0
Buy cheap	8	1	0	0
Buy expensive	0	1	0	0
Do not buy	10	4	0	0
Buy both	-	-	0	0
Expect buying both	-	-	19	32
Buy cheap	-	-	6	13
Buy expensive	-	-	5	8
Do not buy	-	-	0	0
Buy both	-	-	8	11
Observations	320	320	320	320
Equal production cost	42	52	34	34
Expect buying unethically	135	115	133	100
Buy unethically	123	75	125	73
Buy ethically	12	40	3	17
Do not buy	0	0	0	1
Buy both	-	-	5	9
Expect buying ethically	126	148	120	154
Buy unethically	22	20	3	3
Buy ethically	103	124	108	146
Do not buy	1	4	0	0
Buy both	-	-	9	5
Expect buying not	17	5	1	0
Buy unethically	2	1	0	0
Buy ethically	5	1	0	0
Do not buy	10	3	1	0
Buy both	-	-	0	0
Expect buying both	-	-	32	32
Buy unethically	-	-	4	13
Buy ethically	-	-	7	8
Do not buy	-	-	0	0
Buy both	-	-	21	11
Observations	320	320	320	320

Table 15: Expectations and buying decisions (all, part 1)

	NTI	TI	NTC	TC
Equal price or equal production cost	60	58	58	66
Expect buying cheap & unethically	121	113	124	98
Buy cheap & unethically	118	75	118	73
Buy expensive & ethically	3	38	3	15
Do not buy	0	0	0	1
Buy both	-	-	3	9
Expect buying expensive & ethically	19	68	10	50
Buy cheap & unethically	15	20	0	3
Buy expensive & ethically	4	45	6	42
Do not buy	0	3	0	0
Buy both	-	-	4	5
Expect buying cheap & ethically	95	74	104	74
Buy cheap & ethically	91	73	98	74
Buy expensive & unethically	3	0	3	0
Do not buy	1	1	0	0
Buy both	-	-	3	0
Expect buying expensive & unethically	8	2	6	0
Buy cheap & ethically	6	2	0	0
Buy expensive & unethically	-	-	7	8
Do not buy	0	0	0	0
Buy both	-	-	1	0
Expect buying not	17	5	0	0
Buy cheap & unethically	2	1	0	0
Buy expensive & ethically	0	1	0	0
Buy cheap & ethically	5	0	0	0
Buy expensive & unethically	0	0	0	0
Do not buy	10	3	0	0
Buy both	-	-	0	0
Expect buying both	-	-	18	32
Buy cheap & unethically	-	-	3	13
Buy expensive & ethically	-	-	4	8
Buy cheap & ethically	-	-	2	0
Buy expensive & unethically	-	-	1	0
Do not buy	-	-	0	0
Buy both	-	-	8	11
Observations	320	320	320	320

Notes (for part 1 and 2): The very rare cases in which a consumer suggested to collectively buy only one good are here treated the same as if two of the same good would have been suggested. This is also true for stated expectations of the other consumer's suggestion.

Table 16: Expectations and buying decisions (all, part 2)

Appendix C - Instructions

These instruction were handed out in print to the participants of the experiment. The instructions differed for producers and consumers as well as for each treatment. If a paragraph differed in treatments it is here marked with a vertical sideline and printed in every version. The text in brackets at the start of the paragraph denotes to which treatment(s) the paragraph belongs. The instructions are in German since the experiment was conducted in German language.

Instructions for producers

<div style="border:1px solid black; padding:10px;">

Vielen Dank für die Teilnahme am Experiment!

Bitte lesen Sie die Instruktionen auf dieser und der folgenden Seite sorgfältig durch.

Nachdem Sie die Instruktionen gelesen haben, werden Ihnen Verständnisfragen gestellt, die Sie richtig beantworten müssen, um fortfahren zu können.

</div>

Ablauf des Experiments:

In diesem Experiment spielen Sie mit den anderen Teilnehmern im Raum **20 Runden eines Marktspiels**. Die Hälfte der Teilnehmer nimmt die Rolle von Produzenten und die andere Hälfte nimmt die Rolle von Konsumenten ein. **Sie selbst werden als <u>Produzent</u> am Marktspiel teilnehmen**. Sie behalten diese Rolle während des gesamten Experiments. Als Produzent können Sie durch **Produktion und Verkauf von Gütern** in jeder Runde Taler verdienen.

In jeder der 20 Runden des Marktspiels bilden Sie mit drei anderen Teilnehmern eine **Gruppe**. Jede Gruppe besteht aus **zwei Produzenten und zwei Konsumenten**. Die Gruppen werden zu Beginn jeder Runde neu zufällig zusammengestellt. Die Teilnehmer, mit denen Sie in einer Gruppe spielen, können also in jeder Runde andere sein.

Zu Beginn jeder Runde stehen für jede Gruppe **20 Taler als Spende an Ärzte ohne Grenzen** bereit. Dieser Betrag kann jedoch in Abhängigkeit der Entscheidungen der Produzenten der Gruppe **sinken**.

Am Ende des Experiments wird **eine der 20 gespielten Runden zufällig als Auszahlungsrunde ausgewählt**. Die Taler, die Sie **in dieser Runde verdient haben**, werden im Verhältnis 2:1 (2 Taler = 1 Euro) in Euro umgerechnet. Der Euro-Betrag wird Ihnen nach dem Experiment beim Verlassen des Raumes ausbezahlt.

Die **Auszahlungsrunde** bestimmt auch **die tatsächliche Spende**. Die Spendenbeträge aller Gruppen **am Ende dieser Runde** werden addiert und im Verhältnis 2:1 (2 Taler = 1 Euro) in Euro umgerechnet. Der Euro-Betrag wird nach dem Experiment an **Ärzte ohne Grenzen** gespendet. Unter der Webadresse auf dem Papierstreifen auf Ihrem Platz finden Sie innerhalb von zwei Wochen und für die Dauer von drei Wochen eine Bestätigung der Spendenüberweisung.

Auf der nächsten Seite wird der Ablauf einer Runde im Detail erklärt.

Ablauf einer Runde:

Als Produzent erhalten Sie **zu Beginn jeder Runde 10 Taler**. Sie entscheiden, wieviel Sie davon als **Produktionskosten** ausgeben. Die Produktionskosten können **zwischen 0 und 10 Talern** liegen.

Für jeden der zu Rundenbeginn erhaltenen 10 Taler, den Sie <u>**nicht**</u> **als Produktionskosten ausgeben**, entsteht ein **Gesundheitsschaden** von einem Taler. Dies wird durch eine **Reduktion des Spendenbetrags an Ärzte ohne Grenzen** um einen Taler realisiert. Intuitiv können Sie sich dazu vorstellen, dass geringe Produktionskosten schlechte Arbeitsbedingungen bedeuten, die Gesundheitsschäden bei den Arbeitern verursachen, wohingegen bei hohen Produktionskosten Gesundheitsschäden vermieden werden. Wenn Sie zum Beispiel 0 Taler als Produktionskosten ausgeben, wird die Spende um 10 Taler reduziert (hoher Gesundheitsschaden). Wenn Sie hingegen alle 10 Taler als Produktionskosten ausgeben, wird der Spendenbetrag nicht reduziert (kein Gesundheitsschaden). Der Gesundheitsschaden ist **nicht vom Verkauf der Güter abhängig**.

Neben den Produktionskosten legen Sie auch **den Produktpreis** fest, zu dem Sie Ihre Güter den Konsumenten in Ihrer Gruppe anbieten. Sie können einen Produktpreis **zwischen 0 und 30 Talern** wählen.

[NTI & NTC] Danach werden Ihre Güter und die Güter des anderen Produzenten in Ihrer Gruppe **den beiden Konsumenten in Ihrer Gruppe angeboten**. Die Konsumenten **kennen nur den Produktpreis**. Über die Produktionskosten werden sie nicht informiert. Jeder Konsument kann maximal ein Gut von einem beliebigen Produzenten kaufen.

[TI & TC] Danach werden Ihre Güter und die Güter des anderen Produzenten in Ihrer Gruppe **den beiden Konsumenten in Ihrer Gruppe angeboten**. Die Konsumenten **werden über den Produktpreis und die Produktionskosten informiert**. Jeder Konsument kann maximal ein Gut von einem beliebigen Produzenten kaufen.

Abhängig von den Kaufentscheidungen der Konsumenten Ihrer Gruppe können Sie als Produzent also **0, 1 oder 2 Güter verkaufen**. Am Ende einer Runde ergibt sich Ihr Gewinn in Talern wie folgt:

Rundengewinn = **10** − **Produktionskosten** + (**Anzahl verkaufter Güter** ∗ **Produktpreis**)

Der Wert eines Gutes beträgt für die Konsumenten einheitlich 30 Taler. Als Rundengewinn erhalten Konsumenten den Wert des Gutes von 30 Talern abzüglich des Produktpreises. Wenn die Konsumenten kein Gut kaufen beträgt ihr Rundengewinn 0 Taler.

Instructions for consumers

Vielen Dank für die Teilnahme am Experiment!

Bitte lesen Sie die Instruktionen auf dieser und der folgenden Seite sorgfältig durch.

Nachdem Sie die Instruktionen gelesen haben, werden Ihnen Verständnisfragen gestellt, die Sie richtig beantworten müssen, um fortfahren zu können.

Ablauf des Experiments:

In diesem Experiment spielen Sie mit den anderen Teilnehmern im Raum **20 Runden eines Marktspiels**. Die Hälfte der Teilnehmer nimmt die Rolle von Produzenten und die andere Hälfte nimmt die Rolle von Konsumenten ein. **Sie selbst werden als <u>Konsument</u> am Marktspiel teilnehmen**. Sie behalten diese Rolle während des gesamten Experiments. Als Konsument können Sie durch **den Kauf von Gütern** in jeder Runde Taler verdienen.

In jeder der 20 Runden des Marktspiels bilden Sie mit drei anderen Teilnehmern eine **Gruppe**. Jede Gruppe besteht aus **zwei Produzenten und zwei Konsumenten**. Die Gruppen werden zu Beginn jeder Runde neu zufällig zusammengestellt. Die Teilnehmer, mit denen Sie in einer Gruppe spielen, können also in jeder Runde andere sein.

Zu Beginn jeder Runde stehen für jede Gruppe **20 Taler als Spende an Ärzte ohne Grenzen** bereit. Dieser Betrag kann jedoch in Abhängigkeit der Entscheidungen der Produzenten der Gruppe **sinken**.

Am Ende des Experiments wird **eine der 20 gespielten Runden zufällig als Auszahlungsrunde ausgewählt**. Die Taler, die Sie **in dieser Runde verdient haben**, werden im Verhältnis 2:1 (2 Taler = 1 Euro) in Euro umgerechnet. Der Euro-Betrag wird Ihnen nach dem Experiment beim Verlassen des Raumes ausbezahlt.

Die **Auszahlungsrunde** bestimmt auch **die tatsächliche Spende**. Die Spendenbeträge aller Gruppen **am Ende dieser Runde** werden addiert und im Verhältnis 2:1 (2 Taler = 1 Euro) in Euro umgerechnet. Der Euro-Betrag wird nach dem Experiment an **Ärzte ohne Grenzen** gespendet. Unter der Webadresse auf dem Papierstreifen auf Ihrem Platz finden Sie innerhalb von zwei Wochen und für die Dauer von drei Wochen eine Bestätigung der Spendenüberweisung.

Auf der nächsten Seite wird der Ablauf einer Runde im Detail erklärt.

Ablauf einer Runde:

Jeder Produzent erhält **zu Beginn jeder Runde 10 Taler** und entscheidet, wieviel er davon als **Produktionskosten** ausgibt. Die Produktionskosten können **zwischen 0 und 10 Talern** liegen.

Für jeden der zu Rundenbeginn erhaltenen 10 Taler, den ein Produzent **nicht als Produktionskosten ausgibt**, entsteht ein **Gesundheitsschaden** von einem Taler. Dies wird durch eine **Reduktion des Spendenbetrags an Ärzte ohne Grenzen** um einen Taler realisiert. Intuitiv können Sie sich dazu vorstellen, dass geringe Produktionskosten schlechte Arbeitsbedingungen bedeuten, die Gesundheitsschäden bei den Arbeitern verursachen, wohingegen bei hohen Produktionskosten Gesundheitsschäden vermieden werden. Wenn ein Produzent zum Beispiel 0 Taler als Produktionskosten ausgibt, wird die Spende um 10 Taler reduziert (hoher Gesundheitsschaden). Wenn er hingegen alle 10 Taler als Produktionskosten ausgibt, wird der Spendenbetrag nicht reduziert (kein Gesundheitsschaden). Der Gesundheitsschaden ist **nicht vom Verkauf der Güter abhängig**.

Neben den Produktionskosten legen die Produzenten auch **den Produktpreis** fest, zu dem sie ihre Güter den Konsumenten in ihrer Gruppe anbieten. Sie können einen Produktpreis **zwischen 0 und 30 Talern** wählen.

[NTI] Danach können Sie und der andere Konsument in Ihrer Gruppe die Güter **der beiden Produzenten Ihrer Gruppe** kaufen. Als Konsument **kennen Sie nur den Produktpreis**. Über die Produktionskosten werden Sie nicht informiert. Sie **können maximal ein Gut von einem beliebigen Produzenten** kaufen.

[TI] Danach können Sie und der andere Konsument in Ihrer Gruppe die Güter **der beiden Produzenten Ihrer Gruppe** kaufen. Als Konsument **werden Sie über den Produktpreis und die Produktionskosten informiert**. Sie **können maximal ein Gut von einem beliebigen Produzenten** kaufen.

[NTC] Danach können Sie und der andere Konsument in Ihrer Gruppe die Güter **der beiden Produzenten Ihrer Gruppe** kaufen. Als Konsumenten **kennen Sie nur den Produktpreis**. Über die Produktionskosten werden Sie nicht informiert. Jeder Konsument kann **maximal ein Gut von einem beliebigen Produzenten** kaufen. Jeder von Ihnen macht einen Vorschlag für den **eigenen Güterkauf** und auch für **den Güterkauf des anderen Konsumenten**. Danach wird **zufällig ausgewählt**, ob **Ihr Vorschlag oder der Vorschlag des anderen Konsumenten** umgesetzt wird. Mit einer Wahrscheinlichkeit von 50% bestimmen also Sie über den Güterkauf des anderen Konsumenten und mit einer ebenso großen Wahrscheinlichkeit bestimmt der andere Konsument über Ihren Güterkauf.

[TC] Danach können Sie und der andere Konsument in Ihrer Gruppe die Güter **der beiden Produzenten Ihrer Gruppe** kaufen. Als Konsumenten **werden Sie über den Produktpreis und die Produktionskosten informiert**. Jeder Konsument kann **maximal ein Gut von einem beliebigen Produzenten** kaufen. Jeder von Ihnen macht einen Vorschlag für den **eigenen Güterkauf** und auch für **den Güterkauf des anderen Konsumenten**. Danach wird **zufällig ausgewählt**, ob **Ihr Vorschlag oder der Vorschlag des anderen Konsumenten** umgesetzt wird. Mit einer Wahrscheinlichkeit von 50% bestimmen also Sie über den Güterkauf des anderen Konsumenten und mit einer ebenso großen Wahrscheinlichkeit bestimmt der andere Konsument über Ihren Güterkauf.

[NTI & TI] **Der Wert eines Gutes** beträgt für Sie **einheitlich 30 Taler**. Wenn Sie ein Gut kaufen ergibt sich Ihr Rundengewinn aus **30 Talern abzüglich des Produktpreises**. Wenn Sie auf den Kauf eines Gutes verzichten beträgt Ihr Gewinn hingegen 0 Taler.

Am Ende einer Runde ergibt sich Ihr Gewinn in Talern wie folgt:

$$\textbf{Rundengewinn} = \begin{cases} \textbf{30} - \textbf{Produktpreis} & \text{... bei Kauf eines Gutes} \\ \textbf{0} & \text{... bei Verzicht auf Kauf eines Gutes} \end{cases}$$

Beispiel 1: Sie kaufen ein Gut zum Preis von 13 Talern. Ihr Rundengewinn beträgt 30 – 13 = 17 Taler.

Beispiel 2: Sie verzichten auf den Kauf eines Gutes. Ihr Rundengewinn beträgt 0 Taler.

[NTC & TC] **Der Wert eines Gutes** beträgt für Sie **einheitlich 30 Taler**. Wenn Sie ein Gut kaufen ergibt sich der Gewinn aus **30 Talern abzüglich des Produktpreises**. Wenn Sie auf den Kauf eines Gutes verzichten beträgt der Gewinn hingegen 0 Taler. Sie und der andere Konsument **teilen sich den Gewinn aus jedem gekauften Gut**. Für Ihren persönlichen Rundengewinn ist also nicht entscheidend wer welches Gut kauft, sondern nur welche Güter Sie und der andere Konsument insgesamt kaufen.

Am Ende einer Runde ergibt sich Ihr Gewinn in Talern wie folgt:

$$\textbf{Rundengewinn} = \frac{\textbf{G}_1 + \textbf{G}_2}{\textbf{2}}$$

G_1 ... Gewinn aus Ihrem Güterkauf
G_2 ... Gewinn aus dem Güterkauf des anderen Konsumenten

Beispiel 1: Die Preise der beiden angebotenen Güter betragen 13 Taler und 16 Taler. Sie schlagen vor, dass Sie und der andere Konsument jeweils ein Gut zum Preis von 13 Talern kaufen. Wenn Ihr Kaufvorschlag umgesetzt wird beträgt Ihr Rundengewinn: $\frac{(30-13)+(30-13)}{2} =$ 17 Taler.

Beispiel 2: Die Preise der beiden angebotenen Güter betragen 8 Taler und 10 Taler. Sie schlagen vor, dass Sie auf einen Kauf verzichten und der andere Konsument ein Gut zum Preis von 10 Talern kauft. Wenn Ihr Kaufvorschlag umgesetzt wird beträgt Ihr Rundengewinn: $\frac{0+(30-10)}{2} =$ 10 Taler.

Für Produzenten ergibt sich der Gewinn wie folgt:

$$\boxed{\textbf{Gewinn Produzent} = \textbf{10} - \textbf{Produktionskosten} + (\textbf{Anzahl verkaufter Güter} * \textbf{Produktpreis})}$$