University of Passau – Faculty of Business Administration and Economics
Chair of Economic Theory

Gains from Transparency: The Impact of Consumer Information on Market Dynamics and Environment Pollution

Seminar paper
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Lecturer: Dr. Katharina Werner
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Author: Stefan Grundner
Email: grundn03@stud.uni-passau.de
Program: MA International Economics and Business
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1 Introduction

Environmental damage can be a negative external effect of competitive markets. Firms' responsibility in this issue stems from their decision which products to offer on the market and how to produce them. Authorities therefore enact regulations, which more and more put firms under pressure as recently shown in the Volkswagen emission scandal. On the other hand consumers as well bear responsibility because it depends on their buying decisions whether or not environment friendly production pays off for firms. And indeed, consumers increasingly include morale aspects in their buying decisions (Auger et al., 2008; Caruana, 2007; Tiu Wright et al., 2006). Thus, complying with morale rules ascends as an important factor in competition. Big firms like Walmart, Dell and Coca-Cola invest heavily in transparency and greening their supply chains and overall, firms with implemented Environmental Management seem to achieve better economic results (Ghosh and Shah, 2015; Gimenez et al., 2012; Plambeck, 2007). Consumers information about environmental responsible production is considered vital as the increased importance of Corporate Social Responsibility over the last decades has shown (McWilliams and Siegel, 2001). On the other hand Aragón-Correa et al. (2016) found, that big international firms seek legitimation by disclosing information about their environmental activities, although they have on average weaker environmental performance than smaller firms. How then does transparency influence consumers' buying decisions? And how does consumer information impact market dynamics and actual environmental damage in a competitive environment. This study provides answers to these questions from economic experiments.

2 Previous Research

The impact of morale aspects on decisions of market participants has been explored in several papers (e.g. Fischbacher et al., 2009; Güth et al., 1998; Schwieren and Weichselbaumer, 2010). Most of these studies investigate the role of altruism, fairness and inequality aversion among active market participants. External effects of competitive markets though have not been included until only recently two papers appeared:

Pigors and Rockenbach (2016) set up an experiment where a workers produce goods for managers who then offer these goods to consumers. The managers decide freely on the workers wage and the consumer price. The consumers can then decide whether to

buy the offered products or not. In the basic treatment the consumers do not know the workers wage and there is no competition, i.e. one manager offers a good to one consumer. In several treatments the authors than vary consumers information about the workers wage and competition between managers offering their products to the same consumers. They show that consumers take the workers wage as a decision criterion and pay higher prices for goods produced socially responsible.

The second study was done by Bartling et al. (2015). They use a similar experimental design as Pigors and Rockenbach and show a willingness of producers and consumers to forgo some profit for social responsible production and consumption.

The worker serves well to explore the sensitivity of market behavior of producers and consumers on external effects on a third party. The environment though is not a third party but fits more to the notion of a public good (Heal, 1998). Green consumerism and sustainable production can be considered cooperation to provide the public good. Producers who do not shy away from polluting environment to save costs and consumers who simply buy the cheapest products even when they know that their production entailed environmental damage can be thought of defectors. Fehr and Gächter (2002, 2000) have shown, that high levels of cooperation can be achieved in public goods games with the possibility of punishment at hand. Consumers' refusal to buy unsustainable products can be interpreted as punishment of producers that harm environment. The architecture of the monitoring and punishing network in such games influences the impact of punishment (Carpenter et al., 2012). The highest levels of cooperation are achieved in complete networks where everybody can monitor and punish everyone else. In a market environment however only consumers can punish producers.

This paper contributes in three ways to existing literature. Firstly and more generally, it combines a competitive market game with a public goods game. Secondly, it investigates the impact of transparency about public good contribution on market dynamics in a framed setting. Thirdly, it compares market surplus with the negative external effect on a public good in a welfare analysis.

3 Experimental Design and Procedure

The design oft the experiment builds on the competitive market version of the experiment in Pigors and Rockenbach (2016). Participants played in groups of four.

Each group consisted of two producers and two consumers. The groups were randomly matched in every period. The experiment was conducted over 10 periods. In every period producers received an initial endowment of 10 and freely decided over price (0-30) and production cost (0-10) of two products. The production costs were sunk costs (i.e. independent of the amount of (sold) products) and determined the impact of production on the environment. The environment was modeled as a public good with an initial value of 200. Production costs of 10 were environment neutral. Every unit production cost saved caused environmental damage of 0,2. Production costs of 0 thus decreased the value of environment by 2.

Consumers were offered the products of the producers in their group and could decide whether to buy a product and if so which. The value of all products for consumers was 30. A consumer could only buy one product per period. Consequently producers could sell 0, 1 or 2 products. Their payoff in every period was initial endowment minus production cost plus price times number of products sold. The payoff for consumers was 0 when they did not buy a product and 30 minus price when they bought a product. After 10 periods the total payoff of every participant was calculated by residual value of the environment plus cumulated payoffs of all periods.

Total payoff of producers thus was:

$$\pi_P = \sum_{i=1}^{10}(-c_i + p_i * d_i) + 200 - \sum_{i=1}^{10}\sum_{j=1}^{n}\Big(\big(10 - c_{ij}\big) * 0{,}2\Big)$$

with:

i ... index for period

j ... index for producers

c ... production cost

p ... price

d ... demand $\epsilon[0,1,2]$

n ... number of producers

Total payoff of consumers thus was:

$$\pi_K = \sum_{i=1}^{10}\big(b_i * (30 - p_i)\big) + 200 - \sum_{i=1}^{10}\sum_{j=1}^{n}\Big(\big(10 - c_{ij}\big) * 0{,}2\Big)$$

with:

b ... buying decision $\epsilon[0,1]$

The experiment included two treatments. In the baseline treatment consumers only knew the price of the offered products. In the transparency treatment consumers knew price and production cost of the offered products. After the 10th period participants were asked to fill out a questionnaire with personnel data (see Appendix B).

12 Sessions of the experiment were conducted in PC-pools at the University of Passau in June 2016. zTree - Zurich Toolbox for Readymade Economic Experiments by Urs Fischbacher was used to program and run the experiment. Participants were recruited on the spot. Between 8 and 20 participants took part in the single sessions. Before the experiment started they were orally given general instructions (no monetary payoffs, no communication among participants, remain silent, anonymity…) and then read the specific instructions for the experiment on their PC (see Appendix A). An experiment of a fellow student (Thomas Zielinski), which lasted about 10 minutes, was conducted before the experiment of this paper. Distortion of results through the first experiment is unlikely because the experiments were very different.

Always four Participants in a row (by order of arrival) were assigned to a treatment. Observations from treatments in sessions with only 4 participants in this treatment were not included in the analysis of results because randomized matching would not have been possible. In five cases fellow students participated in the experiment when other participants urgently needed to leave before the experiment was finished or when it was necessary to reach the next number of participants dividable by four and no more participants could be recruited. These observations (also observations from participants that left early) were not included in the analysis.

4 Hypothesis

The design of the experiment includes a public goods dilemma. Producers maximize their profit by damaging the environment because they know that consumers would not react to production costs but would just buy the cheapest product. Even if the prices of both offered goods were equal, consumers would be indifferent between high and low production costs because the environmental damage is already exerted through production. Thus higher production costs always curb revenues because the individual marginal profit of avoiding environmental damage is always smaller than its cost. Social

welfare though would be maximized if environmental damage would be avoided completely, i. e. production with maximum cost of 10.

Furthermore competition between producers should drive prices down, leaving producers with (almost) no surplus and maximizing consumers' welfare. The two Nash-equilibra 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 products for nothing. The existing evidence for social preferences though alters the expectation of producer and consumer behavior. In alignment with Fischbacher et al. (2009) competition is not expected to drive prices down to 1 or 0 but to remain on a higher level because of fairness aspects.

4.1 Market Dynamics and Green Consumerism

Consumer information about production costs should not have any influence under standard assumptions. Extensive research on green consumerism on the other hand suggests that consumers are sensitive towards environmental issues. Without information about production costs though, they cannot make good judgment about the environmental impact of the goods offered. They might think, that more expensive products are more environmental friendly because producers demand a more or less constant surplus over production cost. This could dampen price pressure. On the other hand they risk getting tricked because producers know that consumers might think that way. If consumers again are aware of that, they might simply buy the cheapest product despite their environmental concerns.

When consumers know the production costs they can compare the offered goods not only by price but also by their environmental footprint. Compared to the baseline treatment this should lead to higher sensitivity to production cost differences.

H1: Sensitivity of consumers to production cost differences is higher in the transparency treatment than in the baseline treatment.

Under competition the higher consumer sensitivity should force producers to take on higher production costs in the transparency treatment.

H2: Production costs on average are higher in the transparency treatment than in the baseline treatment.

Consumers' decisions have no direct impact on the environment but they may feel responsible to reward or punish producers' behavior with their buying decision. They

will try to maximize their utility from assuming this responsibility and gains from buying a product (30 – product price). In other words they might be willing to forgo some profit and eventually buy the more expensive good for the sake of promoting environmental friendly production (given that the more expensive good was produced with higher production cost). Compared to the baseline treatment this should lead to lower sensitivity to price differences.

H3: Sensitivity of consumers to price differences is lower in the transparency treatment than in the baseline treatment

Under competition the lower sensitivity should result in lower price pressure in the transparency treatment.

H4: Prices on average are lower in the transparency treatment than in the baseline treatment.

4.2 Welfare

Social Welfare is maximized when environmental damage is avoided and when all consumers buy products. Environmental damage should be less in the transparency treatment because production costs are expected to be higher. The effect of consumers' information about production costs on their decision whether to buy or not to buy at all is not clear. Pigors and Rockenbach (2016) found that full information about external effects did not have a significant influence on the propensity that consumers buy a product. Therefore the effect of production costs on welfare is expected to be dominant.

H5: Social welfare is expected to be higher in the transparency treatment than in the baseline treatment.

The prices at which products are sold determine the allocation of gains to producers and consumers. On the one hand producers are expected to bear higher production costs in the transparency treatment. On the other hand prices are expected to be higher as well. No clear expectation can be derived about how the gains of social welfare in the transparency treatment are split between producers and consumers.

5 Results

In this section the results of the experiment will be analyzed.. As in Pigors and Rockenbach (2016) comparisons between treatments use the Mann-Whitney u-test. Table 1 gives an overview over the aggregated market outcomes.

Table 1: Aggregated market outcomes

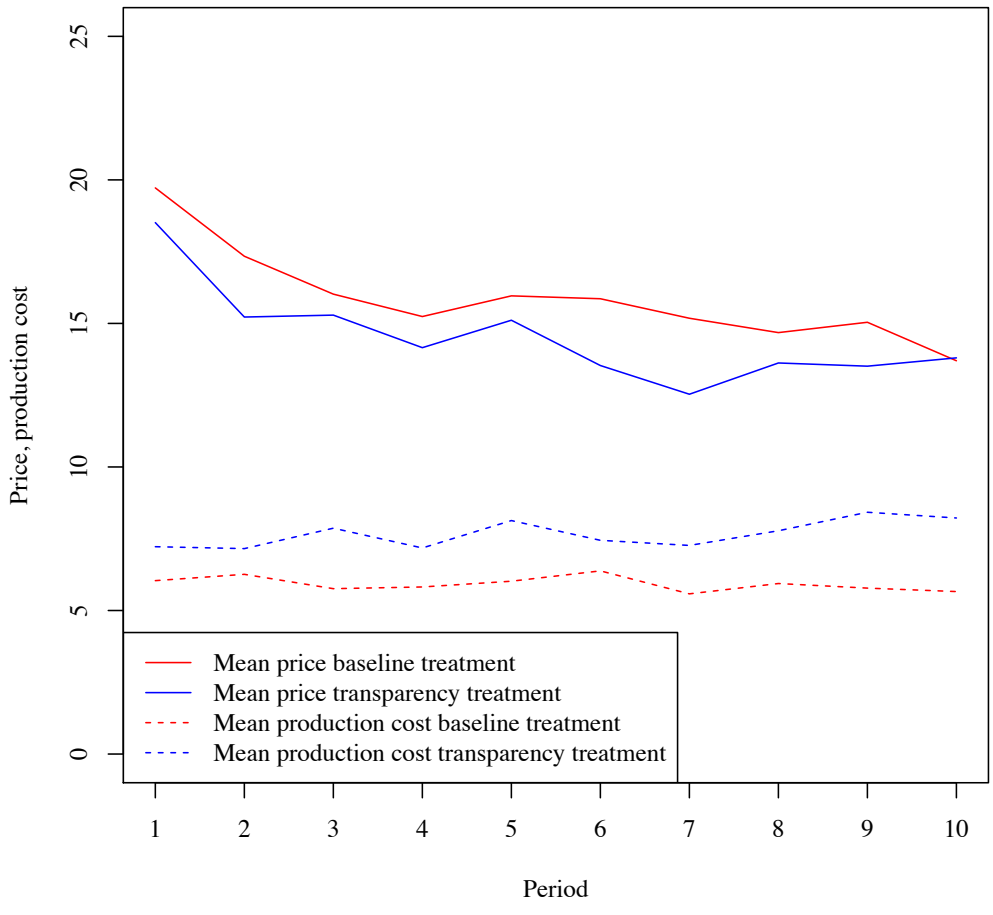
Treatment	Price of products offered	Price of products bought	Production cost of products offered	Production cost of products bought	Consumer surplus per consumer and period	Producer surplus per producer and period
Baseline	15,87 (6,68)	15,06 (5,91)	5,92 (3,17)	5,89 (3,14)	11,99 (7,97)	16,18 (12,77)
Transparency	14,53 (6,54)	13,17 (5,26)	7,67 (2,64)	8,74 (2,00)	14,06 (7,88)	13,20 (11,73)

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

The results show strong deviation from standard theory predictions. Mean prices are approximately half of the product value for consumers and not near 0. Mean production costs are high above 0 even in the baseline treatment and mean profits of consumers and producers in general are not very far from each other.

The differences between treatments are all statistically significant. Interestingly, prices of products offered and bought are both higher in T1 than in T0, which was not expected. Production costs in general and their difference between offered and bought products are higher in the transparency treatment. The profits of consumers and producers change in opposite directions between treatments.

Chart 1: Prices and production costs over periods



The development of prices and production costs over time is shown in chart 1. Prices were constantly lower in the baseline treatment and decreased similarly over the periods in both treatments. Production costs were also lower in the baseline treatment. They increased slightly in the transparency treatment and almost remained stable in the baseline treatment.

In the next sections these aggregated market outcomes are analyzed in more detail with respect to the derived hypothesis.

5.1 Consumer Behavior

Firstly we look at the sensitivity of consumers to production cost, price and their differences between offers. Table 2 gives an overview over frequencies of buying decisions in treatments.

Table 2: Frequencies of buying decisions

Treatment	Buy	Do not buy	Buy cheap	Buy expensive	Buy environment friendly	Buy environment polluting
Baseline	80,21%	19,79%	58,36%	41,64%	46,97%	53,03%
Transparency	83,56%	16,44%	67,50%	32,50%	78,16%	21,84%

Notes: "Buy cheap/expensive" and "Buy environment friendly/polluting" were calculated only from those consumer decisions, where differences in prices/production costs between the offered products occurred.

About eighty percent of consumers buying decisions are positive, i.e. they buy a product. The difference between treatments - although approximately 3 percent - is not statistically significant. To find out, what makes consumers reluctant to buy, a logit regression of consumers buying decision was run on several variables. Table 3 shows the results.

Table 3: Consumer propensity of not buying

	Baseline		Transparency	
Mean price	0,0348	0,0436	0,0424	0,0554
	(0,0385)	(0,0384)	(0,0355)	(0,0389)
Mean cost			-0,4193 ***	-0,4786 ***
			(0,0857)	(0,1063)
Responsibility producer		1,0290 *		-0,0736
		(0,5419)		(0,3269)
Responsibility consumer		-0,9471 *		-0,2681
		(0,4986)		(0,3449)
Importance environment		0,4231		0,3591
		(0,2887)		(0,4369)
Controls	No	Yes	No	Yes
N	479	479	449	449

Notes: Logit regression. Standard errors in parentheses, clustered by Subject: * p < 0.1, ** p < 0.05, *** p < 0.01. Dependent variable: Consumer decision to buy not. The control variables are Age, Sex, Program

In the baseline treatment, the decisions to refrain from buying do not depend on the mean price of offered products. That means that consumers do not consistently try to punish producers for too low or too high prices. Responsibility perceptions though do have a slight influence. Consumers that think producers are responsible for preserving the environment are more likely to refuse to buy, but high perception of consumer responsibility decreases the probability of not buying.

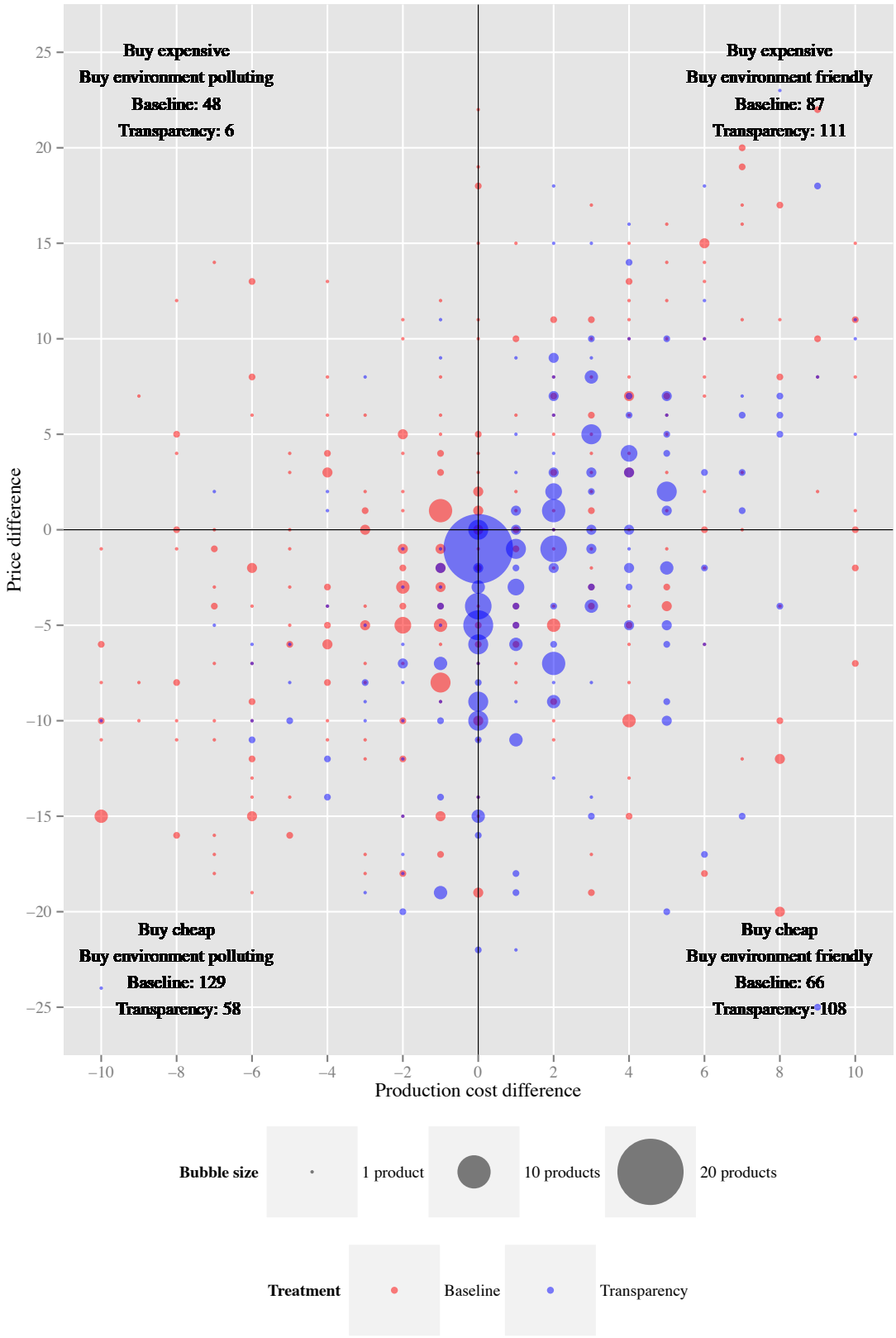
In the transparency treatment consumer's propensity to reject both offers is driven down significantly if average production cost is high. This means that some consumers are willing to forgo utility from buying a product to punish evidently environment-polluting producers.

The propensity of buying cheap/expensive and environment friendly/polluting varies significantly between treatments (Table 2). Over 40% of consumers decided to buy expensive in the baseline treatment. This deviation from strict rationality and selfish preferences can be explained in two ways. Firstly consumers could have social preferences like fairness or inequity aversion and prefer a more equal share for themselves compared to the producers share. Secondly some consumers could try to avoid buying environmental polluting products by buying more expensive products. The question which of the two explanations is more adequate can be answered when looking at the propensities to buy cheap and environment friendly in the transparency treatment.

Because consumers could compare the two offers by price and production cost it is assumed that these characteristics have interacting influence on buying decisions. To examine this chart 2 shows the amounts of products bought with respect to price differences (vertical axis) and production cost differences (horizontal axis) to the alternative offer.

The size of the bubble indicates the amount of products bought at the specific price and production cost difference. The bubble color refers to the treatment. The products bought in the baseline treatment are indicated as red bubbles. Blue bubbles show the products bought in the transparency treatment. The zero lines of the axes divide the chart in quarters. Diagonal opposite quarters are complementary in the sense that consumers decided between them. If offered products differed in price and production cost in a way that one was more expensive and at the same time less environment friendly than its alternative the consumers had to decide between the upper left quarter and the bottom right quarter.

Chart 2: Amounts of products bought with respect to price & production cost difference



While in the baseline treatment in 48 out of 114 cases (42,1%) consumers picked the more expensive and less environment friendly product, only 6 out of 114 decisions

(5,26%) were made similarly in the transparency treatment. This big difference means that a substantial share of consumers in the baseline treatment either is tricked in the attempt to avoid buying polluting products by picking the expensive offer or has social preferences for fairness or inequality aversion which are crowded out by environmental concerns in the transparency treatment. The fact that literally all consumers pick the cheap product when there is no difference in production cost in the transparency treatment (blue bubbles on the vertical zero line) speaks against the social preferences explanation.

If one offered product was more expensive and more environment friendly than its alternative the decision was between upper right and bottom left quarter. This decision bears the morale aspect whether to pay a higher price for cleaner products or save money and buy polluting products in the transparency treatment. In 111 out of 169 cases (65,68%) consumers consciously pick the clean and expensive product. In comparison only in 87 out of 216 cases (40,28%) consumers pick the clean and expensive product in the baseline treatment. This reveals a large potential of consumer information to promote environmental neutral production.

The results so far clearly support H1. Consumers buy cleaner products in the transparency treatment. They do so in the majority of cases even when cleaner products are more expensive than polluting alternatives.

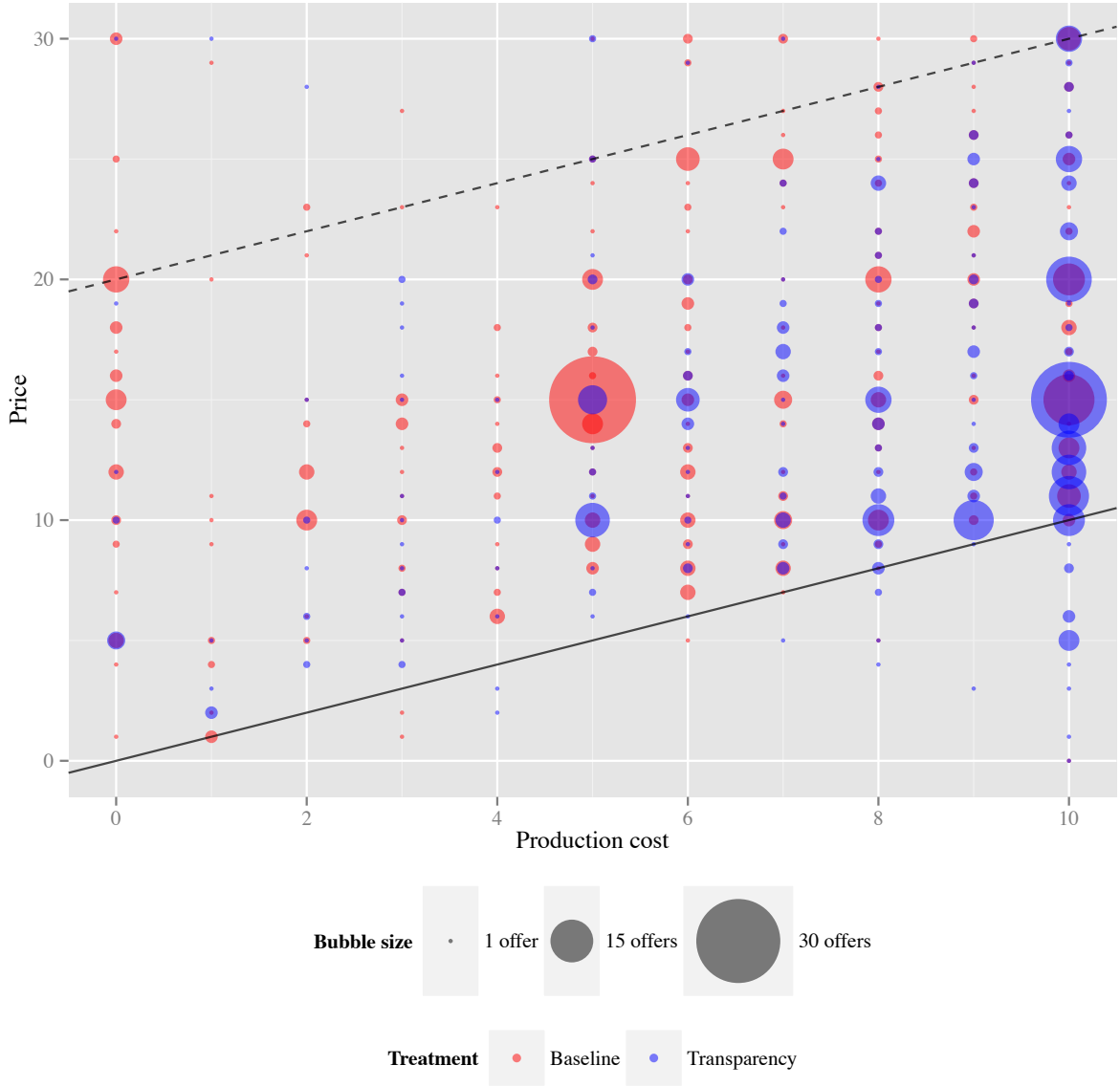
Consumers' attempts to buy clean products by picking expensive offers in the baseline treatment often fail. Nevertheless this behavior results in consumers reacting less sensitive to price differences in the baseline treatment than in the transparency treatment, which contradicts H3.

5.2 Producer Behavior

As already shown in Table 1 producers offered cleaner products at lower prices in the transparency treatment as compared to the baseline treatment. This can be explained by increased consumer sensitivity to price and production cost differences in the transparency treatment. Chart 3 gives a more detailed insight in the characteristics of offered products. It shows the amounts of offers with respect to price and production cost by treatment. In the baseline treatment the middle values of both characteristics seems to be a focal point as many offers are made at a price of 15 with production costs of 5 (6,2%). Also products with production cost of ten are often offered (18%) at various prices. This indicates that many producers decide to contribute to preserve the

environment irrespective of consumer information. 10,6% of producers though offer products with 0 production costs and thus maximize their profit. In the transparency treatment producers react to consumers propensity to buy clean products. The middle focal point vanishes and only 11,56% of offered products bear production costs below 5.

Chart 3: Amounts of offers with respect to price & production cost



36,44% of offers are produced with production cost of 10. Combined these are the main drivers of the difference in mean production cost between the treatments which confirms H2.

The increased propensity of consumers to buy cheaper in the transparency treatment results in an even downward shift of prices compared to the baseline treatment. H4 therefore is rejected.

The solid black line connects all points at which production cost equals price. Besides some offers with production cost of 10 in the transparency treatment, almost no offers were made below this line. Producers were reluctant to offer their products for less than they invested in production. This seems to indicate a fairness threshold. The dotted black line connects all points at which producers profit per sold product is larger than 20. Very few offers lie above this line. An explanation would be that producers care for consumers share if they do not invest in production costs but these fairness concerns are crowded out when producing more environmental friendly.

5.3 Welfare Analysis

When looking only at mean profits per period and disregarding welfare effects from pollution producer surplus suffers losses through transparency. Because of lower prices and higher production costs their profit per period decreases from 16,18 to 13,20 (table 1). Consumers on the other hand benefit from transparency. Their mean profit per period increases from 11,99 to 14,06 because of lower prices (table 1). The picture changes when environmental damage is included in the welfare analysis. Because the treatments were not played in separate sessions, welfare gains for participants had to be calculated for each treatment. Table 4 shows the results.

Table 4: Welfare analysis

Treatment	Mean welfare damage through production per participant per period	Mean welfare gain per participant per period	Mean welfare gain for consumers per period	Mean welfare gain for producers per period
Baseline	7,47	6,61	4,52	8,71
Transparency	4,60	9,03	9,46	8,60

Notes: Values were calculated as if all participants that shared environment value would have played in the same treatment.

The welfare damage in the baseline treatment (7,47) is much higher than in the transparency treatment (4,60) due to lower production costs. Combined with a slightly lower share of positive buying decisions this results in lower welfare gains per participant in the baseline treatment (6,61) compared to the transparency treatment (9,03). H5 therefore is confirmed.

Combined with the mean profits the welfare gains for consumers and producers differ hugely in the baseline treatment. Producers almost gain twice as much per period (8,71) as consumers (4,52). Transparency more than doubles consumer gains (9,46) and leaves producer gains almost at the same level as in the baseline treatment (8,60). This means

that for producers the welfare gain through lower pollution levels almost exactly compensates the effect of lower prices and higher investment in production costs. Consumers benefit twofold in the transparency treatment from lower environment damage and lower prices resulting. From an overall welfare perspective consumer information does not change much for producers but is highly preferable for consumers.

6 Limitations

The most important limitation is the absence of real payoffs form participants. The experiment was conducted in the course of a seminar and sufficient research budget to incentivize participants with money was not available. Participants were asked to try to act as if real payoffs were paid. Of course this may have distorted results.

To create a more realistic setting the experiment was framed verbally by calling the public good environment end clearly denoting negative external effects as environmental damage. The rational concern of participants for the public good and the framing effect therefore cannot be distinguished in this study.

The value of the environment in relation to product value, price and production cost is fixed in the experiment. People's perception of the value of an intact environment though may differ a lot more than their utility from product purchases. The absolute magnitudes of the explored effects therefore cannot be easily applied for implications.

Although participants directly interacted only with participants in the same treatment the public good was shared across treatments. The damage to the environment reported at the end of each round thus was on average higher (for the transparency treatment) or lower (for the baseline treatment) than it would have been if only participants of the same treatment would have shared the public good. Moreover the initial value of the environment and the damage caused relative to production cost was independent of the number of participants. Thus strictly spoken treatments were not completely independent from each other and lower damage to environment in sessions with fewer participants could have distorted results.

7 Concluding Remarks

The results of the experiment show that consumer information about the environmental impact of production has a big potential to decrease negative external effects of competitive markets on environmental pollution. Consumers have a strong propensity

to buy the cleaner product when they are offered a choice. Producers react by increasing their investment in clean production and therefore environmental damage is avoided through consumer information.

Given that consumers are aware that the production of offered goods might have exerted pollution, they hesitate to pick the cheapest products when there is no transparency about production. Under transparency consumers seek to buy environmental friendly and cheap. Introducing transparency therefore does not shift consumer focus from low prices to high production costs but increases competition in both characteristics. As a consequence when consumers are informed about the environmental impact of the production process not only production costs are higher, but at the same time prices are lower.

The welfare analysis shows that profits of producers are driven down through transparency due to lower prices and higher production costs. These losses are balanced by the welfare gains through less environmental damage. Consumers' profits increase through lower prices and combined with the gains from cleaner production they gain hugely from transparency.

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Appendix

A. Instructions for participants

- for all treatments:

Der Ablauf des Experiments:

- Zunächst wird Ihnen eine Rolle zugewiesen, die Sie über die gesamte Dauer des Experiments behalten. Eine Hälfte der Teilnehmer bekommt die Rolle **Produzent**, die andere Hälfte die Rolle **Konsument** zugewiesen.

- Sie teilen mit allen anderen Teilnehmern das gemeinsame Gut **Umwelt**. Die Umwelt hat zu Beginn des Experiments einen Wert von 200 Talern. Der Wert des Gutes Umwelt kann während des Experiments sinken. Am Ende des Experiments wird der gesamte Restwert des Gutes Umwelt zu den von Ihnen gesammelten Talern addiert.

- Das Experiment besteht aus 10 Runden eines Spiels. In jeder Runde werden Ihnen zufällig drei andere Teilnehmer zugeteilt, mit denen Sie eine Spielergruppe bilden. Das heißt, Sie spielen in jeder Runde mit anderen Teilnehmern. Jede Spielergruppe besteht aus zwei Produzenten und zwei Konsumenten.

Wenn Sie diese Ausführungen verstanden haben klicken Sie bitte auf "Weiter".

- for the baseline treatment:

Jede der 10 Spielrunden läuft wie folgt ab:

- Zu Beginn jeder Runde erhält jeder **Produzent** eine Anfangsausstattung von 10 Talern. Jeder Produzent produziert pro Runde zwei identische Güter, die er den Konsumenten in seiner Spielergruppe anbietet. Die Produzenten entscheiden über die **Produktionskosten** und den **Produktpreis**.

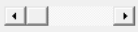
+ Die **Produktionskosten** geben an, wieviel von seiner Anfangsausstattung der Produzent in die Umweltverträglichkeit der Produktion investieren will.

+ Der **Produktpreis** kann zwischen 0 und 30 Talern festgelegt werden.

+ Der **Umweltschaden** durch die Produktion ergibt sich folgendermaßen:

Umweltschaden = (10 - Produktionskosten) * 0,2

Je höher also die Produktionskosten, desto geringer der Umweltschaden. Verändern Sie bitte den Schieberegler für die Produktionskosten, bis Sie den Zusammenhang zwischen Produktionskosten und Umweltschaden verstanden haben.



Produktionskosten	0
Umweltschaden	2.0

- Danach sind die **Konsumenten** an der Reihe. Sie können **maximal ein Produkt** eines der beiden Produzenten aus ihrer Spielergruppe kaufen. Sie können auch kein Produkt kaufen. Sie kennen nur den Produktpreis. Über die Produktionskosten und den Umweltschaden wissen sie nicht Bescheid. Aus einem gekauften Produkt ziehen sie einen einheitlichen Nutzen von 30 Talern.

- Am Ende jeder Runde ergeben sich folgende Auszahlungen in Talern:

Auszahlung Produzent = 10 - Produktionskosten + (Anzahl verkaufter Produkte * Produktpreis)

Auszahlung Konsument bei Kauf eines Produktes = 30 - Produktpreis

Auszahlung Konsument bei keinem Produktkauf = 0

- Nicht verkaufte Produkte verderben am Ende jeder Runde.

- Nach der 10. Runde ergibt sich die **Gesamtauszahlung** aus den kumulierten Auszahlungen der einzelnen Runden und dem gesamten **Restwert des Gutes Umwelt**.

Wenn Sie die Anleitung gelesen und verstanden haben klicken Sie bitte auf "Weiter".

- for the transparency treatment

Jede der 10 Spielrunden läuft wie folgt ab:

- Zu Beginn jeder Runde erhält jeder **Produzent** eine Anfangsausstattung von 10 Talern. Jeder Produzent produziert pro Runde zwei identische Güter, die er den Konsumenten in seiner Spielergruppe anbietet. Die Produzenten entscheiden über die **Produktionskosten** und den **Produktpreis**.

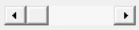
  + Die **Produktionskosten** geben an, wieviel von seiner Anfangsausstattung der Produzent in die Umweltverträglichkeit der Produktion investieren will.

  + Der **Produktpreis** kann zwischen 0 und 30 Talern festgelegt werden.

  + Der **Umweltschaden** durch die Produktion ergibt sich folgendermaßen:

    Umweltschaden = (10 - Produktionskosten) * 0,2

  Je höher also die Produktionskosten, desto geringer der Umweltschaden. Verändern Sie bitte den Schieberegler für die Produktionskosten, bis Sie den Zusammenhang zwischen Produktionskosten und Umweltschaden verstanden haben.



Produktionskosten	0
Umweltschaden	2.0

- Danach sind die **Konsumenten** an der Reihe. Sie können **maximal ein Produkt** eines der beiden Produzenten aus ihrer Spielergruppe kaufen. Sie können auch kein Produkt kaufen. Sie kennen den Produktpreis, die Produktionskosten und den entstandenen Umweltschaden. Aus einem gekauften Produkt ziehen sie einen einheitlichen Nutzen von 30 Talern.

- Am Ende jeder Runde ergeben sich folgende Auszahlungen in Talern:

  Auszahlung Produzent = 10 - Produktionskosten + (Anzahl verkaufter Produkte * Produktpreis)

  Auszahlung Konsument bei Kauf eines Produktes = 30 - Produktpreis

  Auszahlung Konsument bei keinem Produktkauf = 0

- Nicht verkaufte Produkte verderben am Ende jeder Runde.

- Nach der 10. Runde ergibt sich die **Gesamtauszahlung** aus den kumulierten Auszahlungen der einzelnen Runden und dem **gesamten Restwert des Gutes Umwelt**.

Wenn Sie die Anleitung gelesen und verstanden haben klicken Sie bitte auf "Weiter".

B. Questionnaire

Bitte beantworten Sie folgende Fragen:

Ihr Alter:

Ihr Geschlecht
- männlich
- weiblich

Ihr Fachsemester:

Ihr Studienfach
- BA Business Administration and Economics
- BA European Studies
- BA Kulturwirtschaft
- BA Staatswissenschaften
- Jura
- Lehramt
- MA Business Administration
- MA Development Studies
- MA European Studies
- MA International Economics and Business
- MA Kulturwirtschaft
- MA Staatswissenschaften
- anderes

Bitte geben Sie an, wie sehr Sie folgenden Aussagen zustimmen (5 = vollkommene Zustimmung, 0 = keine Zustimmung):

	5	4	3	2	1	0
Umweltschutz ist mir sehr wichtig.	○	○	○	○	○	○
Unternehmen tragen beim Thema Umweltschutz eine große Verantwortung.	○	○	○	○	○	○
Konsumenten tragen beim Thema Umweltschutz eine große Verantwortung.	○	○	○	○	○	○