# Corporate and Consumer Social Responsibilities: Label Regulations in the Lab

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# Corporate and Consumer Social Responsibilities: Label Regulations in the Lab.*

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**Abstract**

Although consumer attitudes toward corporate social responsibility are positive, socially responsible (SR) products are far from gaining significant market shares. Information asymmetries have been identified as one of the factor contributing to this attitude-behaviour gap, because social responsibility is a credence attribute. Signalling may remedy this market failure. We use an experimental posted offer market to investigate the impact of various regulatory requirements for labels on sellers' choice to supply SR products and to signal it, and on buyers' choice of ethical quality. Three treatments are tested: label certification by a third-party, "cheap-talk signalling" with random monitoring and with or without reputations. Individual social preferences are elicited prior to the game, and their distribution generates a positive supply of and demand for social responsibility. When there is third-party certification or cheap-talk signalling with random monitoring and reputations, a separating equilibrium emerges, whereby labelled and non-labelled goods are exchanged at different prices. However, efficiency gains are significant only for third-party certification. Cheap-talk signalling with random monitoring but without reputations does not yield efficiency gains. Moreover, it generates a "halo" effect, whereby buyers are misguided by sellers' claims about product quality. Finally, individual social preferences have a significant effect on players' decisions. Only third-party certification can increase companies' social responsibility and can allow consumers to express their social preferences through consumption.

**Keywords**: labels, social responsibility, social preferences, separating equilibrium, market game.

**JEL codes**: C92, D82, L15, M14.

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## 1. Introduction

The European Commission defines Corporate Social Responsibility (CSR) as "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis". In its view, CSR is a tool that would help reconcile economic, social and environmental ambition.[1] Opinion surveys reveal that there is a growing interest of consumers in the use of social-, environmental- and health-friendly technologies by companies Doane 2001. Many consumers express their concerns about the social responsibility of companies through the purchase of products certified as "fair".[2] However, market share remain quite low – less than 1% for most fair-trade products in France[3] – which emphasizes the wide gap between consumer positive attitudes toward social responsibility and their actual behavior. From an economist point-of-view, two important barriers to ethical consumption are the price of products and the information asymmetry between sellers and consumers.[4] The social responsibility incorporated[5] in a product is a priori a credence attribute, as consumers cannot assess the characteristics of the production process without enduring important information costs Darby and Karni 1973; Nelson 1970. As a consequence, labels are often used to signal this aspect of products quality to consumers. Labels are a means of lowering the marginal information costs relatively to the marginal benefits of knowing that the product incorporates social responsibility Hirshleifer and Riley 1979. They transform credence attributes into search attributes that can be easily checked on point-of-purchases. However, labels do not reduce informational asymmetry if all producers can use them to claim that their production is socially responsible. This is the usual "lemon" problem Akerlof 1970. On the contrary, when labelling is costly and social responsibility is an important dimension of vertical differentiation between products, labels can signal correctly the quality of the product, i.e. they only convey substantiated claims. A separating equilibrium emerges, whereby those consumers with strong preferences for social responsibility will buy socially responsible, high-price, products, and those who pay little attention to social responsibility will buy the standard, low-price, products Rothschild and Stiglitz 1976; Spence 1973.

This paper uses laboratory posted offer markets to analyses the impact of various regulatory requirements for labels on firms' and consumers' decisions. More specifically, we compare the relative impact of third-party certification and "cheap-talk signalling" with random monitoring and with or without reputations on the quality of products exchanged in the market, on prices, on sellers' profits, and sellers' and consumers' production of social responsibility. Under third-party certification, an independent agency checks ex ante whether

[1] The spectrum of activities covered by CSR is rather large, as social responsibility requires that attention be paid to many stakeholders beyond stock holders and consumers, in particular employees and suppliers, and be evaluated along dimensions such as human health, environment or local economic development. CSR has increasingly become an important concept in public policies, corporate communication and management sciences, perhaps because it is seen as a means of embedding moral values into market behaviors, and to achieve the sustainability of modern economies.

[2] In 2000, according to MORI, 66 per cent of European consumers declared that a CSR claim has triggered a purchase at least once (Hines and Ames 2000).

[3] A consumer survey reveals that in 2006, 21% of French were sure to have purchased a product with a social responsibility attribute over the last six months (Delpal and Hatchuel 2007). However, French consumers spent only 1.71 Euro per year on purchases of fair-trade products in 2005, as against 19.02 Euros for the Swiss or 4.62 Euros for the British (Poret 2007).

[4] In addition, the *full* price of a purchase has two components at least, the market price and the cost of time spent at searching for the products. Regarding the latter, consumers often mention the lack of availability or visibility of socially responsible product in their supermarkets as an important obstacle to consumption.

[5] Such incorporation can be material as in aerosol products with no fluorocarbons, or just symbolic as in fair trade coffee.

the firm complies with a minimum quality standard (e.g. no child labour, fair prices paid to farmers etc.) and the firm is allowed to signal the quality of its products through a label. Cheap-talk signalling means that firms can make unsubstantiated claims through uncertified labels or advertising. However, there is often a positive probability that such claims be detected by media, activists or consumer associations. This is modelled as an ex post probability of being detected as not complying with the minimum quality standard, and this information is posted to buyers before they make their choice. In a variant of this random monitoring treatment, we examine whether adding reputation to this random monitoring device change the results. One key difference with previous experimental designs is that we do not induce individual preferences over products quality and the monetary counterpart to the endogenous choice of quality takes the form of real donations to NGOs. Hence, participants do not only maximise payoffs, they also obtain utility from donations. As the existence of a sustainable demand for socially responsible products depends crucially on consumer preferences, not inducing the latter should produce more informative results for the regulation of real markets. Corporate social responsibility depends on consumer social responsibility.

The remainder of the paper is organized as follows. The experimental design and procedures are presented in Section 2. Sections 3, 4 and 5 analyze the results. Section 6 concludes.

## 2. Experimental design and procedures

In each session, subjects play a modified dictator game, through which their social preferences in terms of altruism are elicited. Then, in the second part of the session, participants took part in a posted offer market game.

### *2.1.A posted offer market game*

The trading institution is a variation of the posted offer market (Holt 2006; Plott and Smith 1978). At each market period, eight sellers and twelve customers trade a virtual good. The number of sellers is high enough to induce a perfect or almost perfect Bertrand competition.[6] The roles are randomly determined at the beginning of the market game and participants keep the same role during the whole experiment. The market game is repeated for 20 periods. Each period consists of three stages. In total, four treatments were organized. Each participant took part in only one treatment. We detail below each treatment. Subjects traded using Experimental Currency Units (ECU), which are converted for payments at the end of the experiment, at the rate of 8 ECU = 1 Euro. The conversion rate is known at the beginning of the experiment.

In the control treatment (C treatment), each seller chooses a production cost, c, as well as a price, p. The production cost is, at minimum, 20 ECU per unit sold. The price must be higher than or equal to the production cost. Sellers can choose a production cost higher than 20 ECU. Then, for every unit sold, the difference with the minimum cost (c-20) is given to a NGO, and they must choose which NGO will benefit from the donation in a list of four NGOs: "Emmaüs", the "Red Cross", "Secours populaire" are social NGOs helping poor or homeless people, and "Fonds ADIE" is a NGO that sustains entrepreneurship via micro-credit.[7] In this

[6] It has been shown in the literature that four firms on the market are close to perfect competition as the introduction of additional firms does not affect the degree of competition on the market (see for example Krause et al. 2004).

[7] All these NGOs are well-known by the French population, except "Fonds ADIE" but all participants received details about actions of each NGO.

design, there are neither fixed costs of production nor limited capacities of production: sellers produce the exact number of units sold.[8] All prices are then posted simultaneously and revealed to customers. It is public information that production costs over the minimum cost can generate a donation to one of the four NGO, but only sellers know the exact cost and the NGO. Sellers cannot be identified and tracked across periods, as offers appear on the screen in a random order at each period. Last, buyers receive a fixed endowment, and must purchase at least four units of the virtual good.[9] They can buy all units to a single or several sellers. After all buyers made their choice, individual payoffs are privately provided, and a new period starts automatically.

The payoff functions of all agents (sellers, buyers and NGOs) are common knowledge. At each period, the payoffs πj of a seller j are computed as follows:

$$\pi_j = E_j + (p_j - c_j)q_j, \forall j \in \{1,2,...,8\}$$

With qj is the number of units sold by seller j in the period. A fixed payment of Ej=50 ECU has been added to limit disparities in payments between sellers and customers, and to reach a minimum average gain for those participants who are assigned to the role of sellers.

The payoffs of a buyer i in every period are:

$$W_i = E_i - \sum_{j=1}^{8} q_{ij} p_j, \forall i \in \{1,2,...,12\}$$

where qji is the number of units that buyer i has purchased from seller j (note also that $\sum_{i=1}^{12} q_{ji} = q_j$). At the beginning of each period, each buyer receives an endowment of *Ei=250* ECU. A NGO *k* will receive the following donation:

$$D_k = \sum_{j=1}^{8} (c_j - 20) q_j d_{jk}, \forall k \in \{1,2,3,4\}$$

where djk is a dummy variable that equals 1 if seller j chooses NGO k as beneficiary, and 0 otherwise.

In this experimental design, the donation associated to each unit sold is not observed. It is a credence attribute. From buyers' point of view, products are differentiated according to the expected donation that each unit purchased can generate. This expected donation is a measure of the ethical quality of the product. As emphasised in Section 2, we do not induce preferences over quality, which makes a difference with the experimental designs previously used in the literature Cason and Gangadharan 2002. The buyers' valuation of quality is the utility associated to positive donations, i.e. to purchasing goods whose production costs are expected to be higher than 20 ECU. This utility depends on buyers' preferences for donations to the NGOs and their expectations regarding the amount of the donation, and not on the parameters implemented by the experimentalist through payoff functions. The expected

[8] We could have supposed limited production capacities for sellers as it is often assumed in industrial organization theory. However, this would raise methodological issues regarding the interpretation of the results. If buyers knew that production capacities were limited, they would make their choice more quickly. Hence, some of them would certainly not have enough time to carefully choose their preferred option and this would generate noise. To obtain more reliable results, we therefore assume that sellers can always satisfy the demand.

[9] As we did not want to formally induce customers' preferences in their payoff function as it can be the case in posted offer market games, we force customers to buy a minimal number of units (this framework is also used in Rode et al. 2008). This corresponds for instance to food choices or any goods that individuals have to purchase on a regular basis.

donation/quality is a function of the information set of the buyer. The various treatments manipulate the structure of this information set.

### *2.2.Main research treatments*

The three other treatments have been designed in order to analyze the effect of labels and various label regulations on the market, in comparison with the control treatment. There are two types of label regulations that differ by requirements on labelling: a certification delivered by an independent third-party; cheap-talk signalling with random monitoring. Regulation by a third-party corresponds to official certifications as ISO norms or labels administered by independent certifying agencies with strict criteria of attribution such as Max Havelaar. Cheap-talk signalling corresponds to unregulated company labels, usually called "logo", or to advertising campaigns about a company's social investments. Although there is no certification agency that controls whether the company has any substantiation for its claims, media, activist groups or consumer associations can and sometimes do assume this role. A key difference with third-party certification is that this monitoring activity corresponds to a random probability that unsubstantiated claims be detected.[10] In addition, the consequences of detection differ according to whether its reputation is at stake or not. We therefore run one treatment with third-party certification, one treatment with cheap-talk signalling without reputation and one treatment with market regulation with cheap-talk signalling reputation.

In the third-party certification treatment (TP treatment), sellers can choose to post a label together with the price when they choose their production cost. They can post the label only if their production cost is higher than or equal to 25 ECU. The label is perfect, as it indicates that sellers have a production cost higher than or equal to 25 with probability one. This is common knowledge for all participants in the session.

The cheap-talk signalling with random monitoring treatment (RM treatment) is similar to the TP treatment, except that the label has not the same features. The label is not certified, since sellers with a production cost lower than 25 ECU can also post a label with their offer. However, those sellers who post a labelled offer but have chosen a production cost lower than 25 ECU have a probability equal to 1/3 to be detected as not fulfilling the minimum quality standard of 25 ECU. In this case, the offer appears on buyers' screens with the mention "Has the label but the production cost is lower than 25 ECU". The probability of detection is independently and identically distributed across sellers.

The cheap-talk signalling with random monitoring and reputation treatment (RMR treatment) is identical to the RM treatment, except that sellers can be tracked across periods. Each seller is identified by a letter (from A to H) that is the same for the whole game.

### *2.3.Elicitation of social preferences*

Before subjects participate in the market game, they all play in a modified version of the dictator game, which is conducted to elicit their social preferences, and more precisely their altruism. Each participant receives an endowment of 50 ECU. Then, they have to decide how much they want to give to one of the NGO presented above ("Emmaus", "Red Cross", "Secours populaire" and "Fonds ADIE"). They can give between 0 and 50 ECU, and keep the remaining sum. It is common knowledge that all decisions are anonymous, and that NGOs will really receive the donations. In addition, the participants do not know that they are going to play the market game.

### *2.4.Procedures*

[10] Certification agencies also use random monitoring procedures, but only when the company has been certified for the first time. We here abstract from this consideration.

All sessions have been conducted at the University La Sorbonne in Paris. The design was computerized with the software "Regate" (Fischbacher 2007). The recruitment was made with the software "ORSEE" (Greiner 2004). We organized 19 sessions, with 20 participants in each session. In total, 380 subjects participated in the experiment: 40 subjects in the control treatment, 120 subjects in the third-party certification treatment, 120 subjects in the random monitoring treatment and 100 subjects in the reputation treatment.[11]

For payment, subjects received the sum of their payment in the modified dictator game, in the market game and a show-up fee equal to 4€. In the market game, one period out of the 20 periods was randomly drawn at the end of the session. Hence, payments were determined at the end of the sessions. They were received in a separated room to preserve confidentiality. Each session lasted between 120 and 140 minutes and participants received on average 23.20€. After the sessions, we made the donations online and sent back to participants a proof of payment.

## 3. Label regulations and the emergence of a separating equilibrium

### *3.1. Label regulation with third-party certification*

In the third-party certification treatment, customers can choose to buy labeled or non-labeled goods when they are offered on the market. We first determine whether a demand for goods with high ethical quality exists, i.e., a demand for labelled goods. Figure 1 presents market shares of sellers who have a label and shares of labelled goods exchanged on the market by period in the TP treatment.

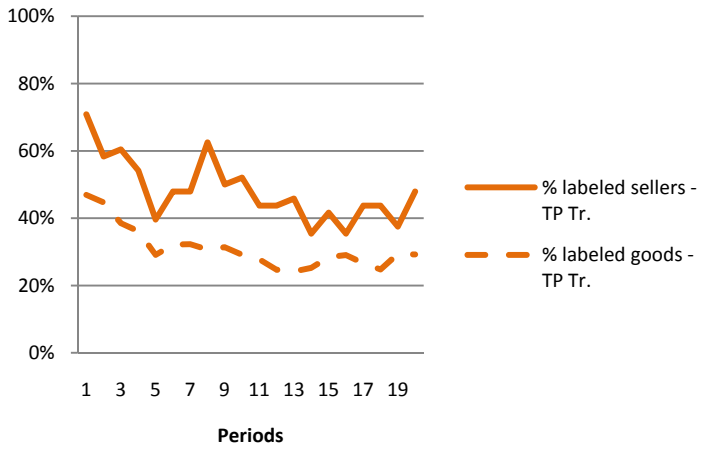


*Figure 1. Evolution of market shares of labeled sellers and goods in the TP treatment*

The figure shows that there exists a positive demand for labelled goods when labels are certified by a third-party. On average, 31% (28.4% for periods 6 to 20) of exchanged goods are labeled goods. The share of sellers with the label is on average 48.1% (45.3% for periods 6 to 20). These results are summarized in Result 1.

Result 1. In case of a label regulation certified by a third-party, a demand for goods with a high ethical quality exists. The share of sellers offering labeled goods is higher than the share of labeled goods exchanged on the market.

We study now the market prices. We analyze the average price of goods in the third-party certification treatment and in the control treatment. The average price is a weighted average: it

[11] The average age was 26 and 48.7% of participants were men.

is equal to the sum of all prices times the number of goods sold at each price divided by the total number of goods sold on the market at the current period. Figure 2 presents the evolution by period of the average price of goods on the market in the C and TP treatments.

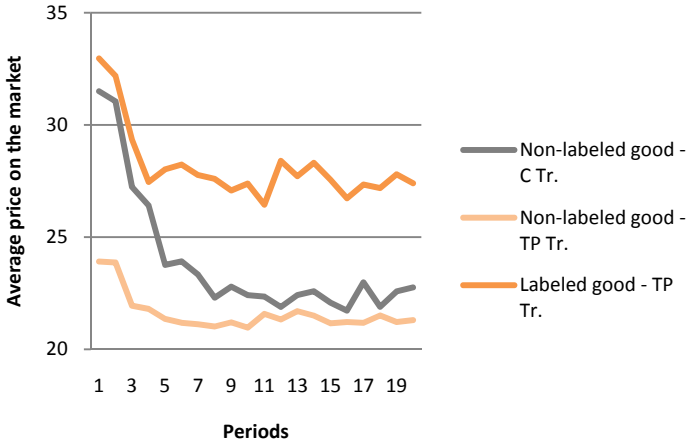


*Figure 2. Evolution of the average price on the market in the C and TP treatments*

We observe that the market is stabilized after period 5. So, we make the analysis for data from period 6 to period 20. From period 6 to period 20, the average price is 22.54 in the control treatment. In the third-party certification treatment, the average price of non-labeled goods is 21.31 and the average price of labeled goods is 27.39. Two types of good are exchanged on the market in the TP treatment and each type of goods is exchanged at a significantly different price (Wilcoxon signed-rank test with one independent observation per session that is the average price over periods from periods 6 to 20: $z=2.201$, $p=0.028$).

Result 2. . In case of a label regulation certified by a third-party, both non-labeled and labeled goods are exchanged on the market and these two types of goods are sold at different prices.

*3.2. Cheap-talk signalling with random monitoring*

When the label regulation is not certified by a third-party, the truthfulness of the label is diminished. Sellers can receive a label although they do not comply with the conditions to receive the label. Figure 3 presents market shares of sellers who have a label and shares of labeled goods exchanged on the market by period in the RM and RMR treatments.

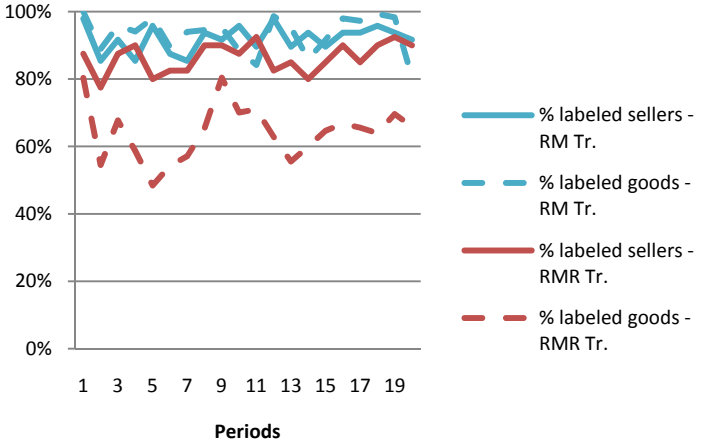

*Figure 3. Evolution of market shares of labeled sellers and goods in the RM and RMR treatments*

Regarding market shares, in total, 93.4% (92.7% for periods 6 to 20) of exchanged goods are labeled goods in the RM treatment. When reputation of sellers is introduced, 64.1% (64.9% for periods 6 to 20) of exchanged goods are labeled goods. In the RMR treatment, the share of sellers with the label is on average 86.4% (87% for periods 6 to 20). Figure 4 presents the evolution of prices of both labeled and non-labeled goods in the RM and RMR treatments.

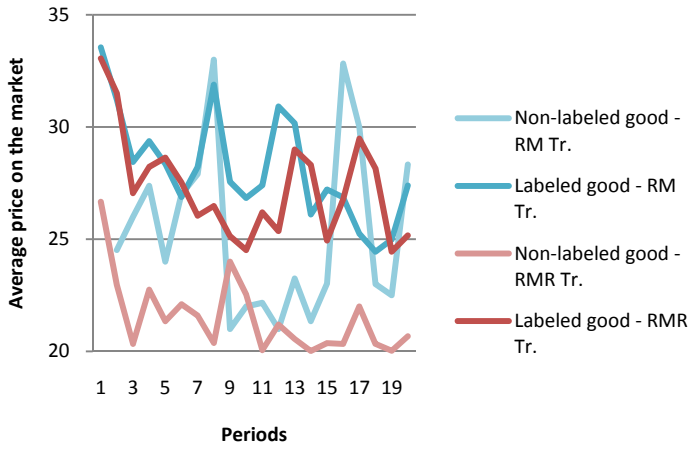


*Figure 4. Evolution of the average price on the market in the RM and RMR treatments*

In the RM treatment, the average price of the non-labeled good is not significantly different from the average price of the labeled good (Wilcoxon signed-rank test with one independent observation per session: $z=0.105$, $p=0.917$). Results are different when reputation of firms exists. In this case, the average price of labeled goods is significantly higher than the average price of non-labeled goods (Wilcoxon signed-rank test with one independent observation per session: $z=2.023$, $p=0.043$). Result 3 summarizes the results we just described.

Result 3. In case of a label regulation by the market, only labeled goods are offered on the market when sellers have no reputation. When reputation of sellers is introduced, both labeled and non-labeled goods are offered at different prices. Average prices of labeled goods are significantly lower in the RMR treatment than in the TP treatment.

## 4. Label regulations and efficiency

Efficiency gains are observed when there is a label regulation instead of no regulation if customers with different social preferences buy goods maximizing their utility, i.e., when both labeled and non-labeled goods are offered on the market, sellers' profits are unchanged or reduced and donations to NGOs are increased. We run linear regressions testing the significance of differences in payoffs of all agents per period from period 6 to period 20, i.e., sellers' profits, customers' payoffs and donations to NGOs, in the TP, RM and RMR treatments in comparison to the C treatment. We control for a time trend. Standard errors are adjusted for clusters in sellers when the dependant variable is sellers' profits or donations to NGOs and for clusters in customers when the dependant variable is customers' payoffs. Table 1 presents the results.

| Dependant variable: Payoffs | | | |
|---|---|---|---|
| | Sellers' | Customers' | NGOs' |
| Periods | -0.275*** | 0.417*** | -0.164** |
| | (0.086) | (0.088) | (0.012) |
| C Treatment | Ref. | Ref. | Ref. |
| TP Treatment | -3.040 | -5.423 | 6.731*** |
| | (2.533) | (4.648) | (1.797) |
| RM Treatment | 5.217* | -5.045 | 0.713 |
| | (2.880) | (4.148) | (1.591) |
| RMR Treatment | -2.296 | 1.483 | -0.178 |
| | (2.566) | (3.454) | (1.311) |
| Constant | 16.356*** | 152.344*** | 4.952*** |
| | (2.445) | (3.093) | (1.608) |
| Observations | 2280 | 3420 | 2280 |
| Prob > F | 0.000 | 0.000 | 0.000 |
| R-squared | 0.050 | 0.012 | 0.056 |

*Table 1. Linear regression explaining payoffs between treatments*

Result 4 and 5 summarize efficiency gains in the various treatments.

Result 4. In case of a label regulation certified by a third-party, efficiency gains are obtained in comparison to a situation without any regulation: customers buy goods that maximize their utility, average sellers' premiums are unchanged and average donations are increased.

Result 5. In case of a market label regulation, no efficiency gains are observed when there is no sellers' reputation in comparison to a situation without any regulation: only one type of goods is offered on the market, sellers make additional profits and donations are not higher. When sellers' reputation is introduced, efficiency gains are observed in comparison to a situation without any regulation but they are lower than in comparison to a situation with a label regulation certified by a third-party.

The market game is a zero-sum game in the sense that the total amount of wealth is identical in all sessions in all treatments. According to our framework, production costs are different depending on the number of goods sold on the market. In table 2, we report variations of payoffs of sellers, customers, NGOs and of production costs when a label regulation is introduced in comparison to a situation with no label regulation.

| | C Treatment | TP Treatment | RM Treatment | RMR Treatment |
|---|---|---|---|---|
| Profits | - | -24,32 | +41,73 | -18,37 |
| Customers' gains | - | -65,08 | -60,54 | +17,79 |
| Donations | - | +53,84 | +5,70 | -1,43 |
| Production costs | - | +35,56 | +13,11 | +2,00 |
| Number of sold goods | - | +1,78 | +0,66 | +0,10 |

*Table 2. Transfers of sum of payoffs per period per treatment relatively to the C treatment*

We observe that when a label certified by a third-party is introduced, customers and sellers support a decrease of their payoffs to increase payoffs of NGOs. In case of the implementation of a label market regulation, when sellers have no reputation, only customers support losses, mainly to increase sellers' profits. NGOs only marginally benefit from the decrease of customers' payoffs. When there is a reputation of sellers, transfers are made from sellers to customers. Donations to NGOs are decreased but of a thin amount.

We observe significantly higher sellers' profits in the RM treatment than in the C treatment. This result cannot be explained by the informational rent sellers may benefit from in the RM treatment as the information asymmetry is as strong in the RM treatment, as in the C treatment. Instead, we suggest that we observe a halo effect. The halo effect is originally defined by Edward Thorndike as "a problem that arises in data collection when there is carry-over from one judgment to another" (Thorndike 1920).[12] In our framework, the halo effect is a perception error of customers about sellers' social preferences and about the ethical quality of goods inferred from prices due to the implementation of a label regulation where the ethical quality of goods is emphasized. In the RM treatment, it is made prominent for customers via the explanation of the label that sellers may choose production costs higher than the minimum to induce donations to NGOs through their sales. In the C treatment, customers know that sellers may make donations to NGOs through their sales but it is less prominent than in the RM treatment as labels cannot be used. Customers appear to believe more in sellers' social preferences when the ethical quality of goods is emphasized although the way it is emphasized cannot be truthful. Therefore, a label market regulation without firms' reputation should be avoided to preserve customers' well-being. Result 6 summarizes these results.

Result 6. In case of label market regulation without sellers' reputation, customers are subject to a halo effect that decreases their well-being.

## 5. Individual social preferences and market choices

We proxy subjects' social preferences by the amount subjects give to NGOs in the modified dictator game. Social preferences of subjects are increased all the more as the amount given to NGOs are increased. We observe heterogeneity in subjects' social preferences. This is true for sellers as well as for customers. Kolmogorov-Smirnov tests comparing distributions of donations between all treatments are not significant neither for sellers nor for customers.

Table 3 presents results of linear regressions explaining sellers' choices of production costs in each treatment. Independent variables are donations to NGOs in the first part of the experiment, gender, age and we control for a time trend. Standard errors are adjusted for clusters in sellers.

| Dependant variable: Sellers' production costs | | | | |
|---|---|---|---|---|
| | C Treatment | TP Treatment | RM Treatment | RMR Treatment |
| Periods | -0.014 | -0.051** | -0.026 | -0.026 |
| | (0.076) | (0.026) | (0.030) | (0.023) |
| Donation in first part | 0.037 | 0.067*** | 0.061** | 0.040** |
| | (0.047) | (0.018) | (0.030) | (0.018) |
| Gender | 0.743 | 0.445 | -0.797 | 0.236 |
| | (1.229) | (0.665) | (0.681) | (0.489) |
| Age | 0.022 | 0.089 | 0.123** | 0.086** |
| | (0.033) | (0.064) | (0.046) | (0.040) |
| Constant | 20.425*** | 20.092*** | 18.625*** | 19.125*** |
| | (2.448) | (1.655) | (1.271) | (1.090) |
| Observations | 240 | 720 | 720 | 600 |
| Prob > F | 0.853 | 0.000 | 0.013 | 0.026 |
| R-squared | 0.014 | 0.088 | 0.136 | 0.052 |

*Table 3. Linear regressions explaining sellers' production costs*

[12] Thorndike 1920 was the first empirical study supporting the halo effect. The application was the rating of employees.

Regression coefficients lead to result 7.

Result 7. The production cost chosen by sellers in the market game increase as their social preferences increase when a label regulation is implemented.

We run linear regressions to study whether decisions of customers to buy labeled goods is driven by their social preferences. The explaining variable is the proportion of labeled goods each customer buys in a period. We restrict our analysis to periods 6 to 20.

| Dependant variable: Proportion of labeled goods bought by customer | | | |
|---|---|---|---|
| | TP Treatment | RM Treatment | RMR Treatment |
| Periods | -0.002 | -0.005** | 0.005 |
| | (0.003) | (0.002) | (0.003) |
| Donation in first part | 0.015*** | 0.002 | 0.012*** |
| | (0.003) | (0.001) | (0.004) |
| Gender | 0.097 | -0.036 | -0.100 |
| | (0.072) | (0.045) | (0.109) |
| Age | 0.012*** | -0.001 | 0.016*** |
| | (0.003) | (0.002) | (0.006) |
| Constant | -0.342*** | 0.947*** | 0.083 |
| | (0.116) | (0.061) | (0.187) |
| Observations | 540 | 540 | 540 |
| Prob > F | 0.000 | 0.034 | 0.001 |
| R-squared | 0.420 | 0.017 | 0.186 |

*Table 4. Linear regression explaining the proportion of labeled goods bought by customers*

Result 8 summarizes the relation between customers' social preferences and customers' purchases of labeled goods.

Result 8. The proportion of labeled goods bought by customers depends positively on customers' social preferences only when the implemented label is truthful, i.e., only in the TP and RMR treatments.

## 6. Conclusion

The experiment we run allowed us to precisely analyze the consequences of an implementation of different types of labels on both the supply and the demand sides. Our experiment is among the first empirical studies identifying how corporate and consumer social responsibilities influence the market. Without implementing consumers' preferences through their payoff function, we find that a demand for ethical goods exists although they are sold at higher prices than non-ethical goods. A label regulation with a third-party certification leads to efficiency gains in comparison to a situation with no labeling possibility for firms. In case of a market regulation, when firms have a reputation, both non-labeled and labeled goods are sold on the market at different prices but efficiency gains are not observed as donations to NGOs are equivalent to donations when there is no label regulation. As expected, when firms have no reputation, the market label regulation does not lead to a separating equilibrium. However, data show that consumers support a halo effect that leads to a decrease of their well-being but to an increase of firms' profits. Indeed, the data suggest that consumers misperceive the ethical quality of goods inferred from prices because the ethical quality of goods is emphasized through the label regulation. Regarding the influence of social preferences on both firms' and consumers' behavior, we observe that sellers' choice of production costs increases with their social preferences when any label is implemented and customers' decision to buy labeled goods increases with their social preferences only when the label is credible enough, i.e., in the third-party certification and the reputation treatments.

In terms of political recommendations, our data suggest that a label market regulation should be avoided when firms have no reputation as consumers' well-being is reduced. Besides, a label market regulation with firms' reputation does not lead to efficiency gains. In order to allow consumers who positively value the ethical quality of goods to express their social preferences in their buying decisions and to increase social aspects of the society, the only label regulation is a regulation with a third-party certification. Although certification fees must be supported, this is the only way of increasing efficiency.

**References**


Akerlof, G.A. (1970), 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism', *The Quarterly Journal of Economics,* 84 (3), 488-500.

Cason, TN and Gangadharan, L (2002), 'Environmental Labeling and Incomplete Consumer Information in Laboratory Markets', *Journal of Environmental Economics and Management,* 43 (1), 113-34.

Darby, M.R. and Karni, E. (1973), 'Free Competition and the Optimal Amount of Fraud', *Journal of Law and Economics,* 16, 67-86.

Delpal, F. and Hatchuel, G. (2007), 'La consommation engagée s'affirme comme une tendance durable', *CREDOC, Consommation et modes de vie,* 201, 1-4.

Doane, D. (2001), *Taking Flight: The Rapid Growth of Ethical Consumerism* (London: New Economics Fundation).

Fischbacher, U. (2007), 'z-Tree: Zurich toolbox for ready-made economic experiments', *Experimental Economics,* 10 (2), 171-78.

Greiner, B. (2004), 'The Online Recruitment System ORSEE 2.0–A Guide for the Organization of Experiments in Economics', *Papers on Strategic Interaction, University of Cologne, Working Paper Series in Economics,* 10.

Hines, C. and Ames, A. (2000), *Ethical Consumerism. A Research Study Conducted for the Co-Operative Bank by MORI* (London: MORI).

Hirshleifer, J. and Riley, J.G. (1979), 'The Analytics of Uncertainty and Information-An Expository Survey', *Journal of Economic Literature,* 17 (4), 1375-421.

Holt, C. A. (2006), *Markets, Games, and Strategic Behavior* (Boston: Pearson/Addison-Wesley).

Krause, M, Kroger, S, and Potters, J (2004), 'Insights from experimental economics for market regulation', *Tijdschrift voor Economie en Management,* 49 (2), 217-38.

Nelson, P. (1970), 'Advertising as Information', *Journal of Political Economy,* 81, 729-54.

Plott, Charles R. and Smith, Vernon L. (1978), 'An Experimental Examination of Two Exchange Institutions', *Review of Economic Studies,* 45 (1).

Poret, S. (2007), 'Les défis du commerce équitable dans l'hémisphère Nord', *Economie Rurale,* 302, 56-70.

Rode, Julian, Hogarth, Robin M., and Le Menestrel, Marc (2008), 'Ethical Differentiation and Market Behavior: An Experimental Approach.', *Journal of Economic Behavior and Organization,* 66, 265-80.

Rothschild, M. and Stiglitz, J. (1976), 'Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information', *The Quarterly Journal of Economics,* 90 (4), 629-49

Spence, M. (1973), 'Job Market Signaling', *The Quarterly Journal of Economics,* 87 (3), 355-74.

Thorndike, E. L. (1920), 'A constant error in psychological ratings', *Journal of Applied Psychology,* 4, 469-77.