

Making information on CSR scores salient: a randomized field experiment*

Leonardo Becchetti

*University of Rome, Tor Vergata
becchetti@economia.uniroma2.it*

Francesco Salustri

*University of Rome, Tor Vergata
francesco.salustri@uniroma2.it*

Pasquale Scaramozzino

*SOAS University of London and University of Rome, Tor Vergata
ps6@soas.ac.uk*

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Abstract

We locate a giant scorecard poster with social and environmental responsibility scores of the ten leading world food companies, measured by the Oxfam “Behind the Brands” world campaign, at the entrance of selected supermarkets. We test the impact of such scores on consumers’ choices with a randomized field experiment. Our findings show that the Oxfam ranking matters since the treatment has a positive and significant effect on the market share of the companies with the highest scores and a negative and significant effect on the companies placed at the lowest ranks. Invisibility matters negatively since the largest non-ranked companies selling in the store experience a slight fall in their market shares. More in general, we find that an improvement in the total Oxfam scores has a positive and significant impact on market share of the company.

Keywords: consumer economics, randomized field experiment, corporate social responsibility.

JEL numbers: D12 (Consumer Economics: Empirical Analysis); C93 (Field Experiments); M14 (Corporate culture, Social responsibility).

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1. Introduction

A large and consolidated body of theoretical and empirical research in the behavioural literature postulates or documents the existence of other-regarding preferences. Most of this literature refers to laboratory experiments which show that individuals, beyond self-interest intended as the desire to increase their monetary endowments and consumption levels, are also driven, among others, by other-regarding preferences (Cox, 2004), positive and negative reciprocity (Rabin, 1993), social-welfare preferences (Charness and Rabin, 2002), inequity aversion (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000), and different forms of pure and impure (warm glow) altruism (Andreoni, 1989 and 1990).

In parallel, several theoretical and empirical contributions have investigated the novel and growing phenomenon of corporate social responsibility (CSR).¹ Most of these empirical studies focus on the relationship between CSR and corporate performance, while theoretical research investigates the impact of CSR on the traditional welfare goals of standard theoretical models (Baron, 2003; Besley and Ghatak, 2007; Bénabou and Tirole, 2010).

The novelty of the present paper lies in the establishment of a nexus between these two fields (behavioural economics and the CSR literature) by means of a randomized field experiment where a poster scorecard with detailed scores of the ten largest world food companies is located at the entrance of selected supermarkets. This enables us to test the impact of CSR information on consumer choices. Information provided to customers entering the supermarkets is retrieved from the international Oxfam Behind the Brands campaign. The campaign provides a scorecard with synoptic corporate social and environmental responsibility scores for seven CSR domains (Transparency, Women, Workers, Farmers, Land, Water, and Climate) for each of the ten leading world food and beverage corporations. Scores are created by aggregating a large number of indicators with a rigorous methodology described in detail in the campaign website (see section 2 below).² For each company, the sum of the 7 CSR scores yields a synoptic number that determines its ranking. The scores can be found online on the campaign website where, by clicking on icons of the typical brands of the 10 companies, web surfers can access their detailed scores and are prompted to send a message of approval/disapproval to the companies.

The Behind the Brands campaign is organised by Oxfam as a long-term challenge, with scores and rankings updated every 2 months. The relevance of the campaign at world level is proven by two

¹ Two institutional definitions of CSR come from the European Commission and the World Bank. According to the first (EC, 2001), companies are socially responsible when they "integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis". The World Bank agreed on the definition of the World Business Council for Sustainable Development (WBCSD, 2002), defining CSR as "the commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve quality of life, in ways that are both good for business and good for development". For literature reviews on CSR see, among others, Kitzmueller and Shimshack (2012), Hoi, Wu and Zhang (2013) and Dhaliwal et al. (2012).

² Information on the campaign as well as details on its methodology are available at

<http://www.behindthebrands.org/~/>

[media/Download-files/BtB%20Methodology%20document_final_Sept%202014.aspx](http://www.behindthebrands.org/~/media/Download-files/BtB%20Methodology%20document_final_Sept%202014.aspx).

main facts. First, 31 major investment funds, representing nearly 1.5 trillion dollars of assets under management have joined Oxfam's call on the world largest food corporations to do more to reduce social and environmental risks in their supply chains. Second, supporters of the campaign have taken nearly 700,000 actions in the last three years and their action has produced corporate reaction and fostered an engagement process by some of the ten corporations with Oxfam itself.

The contribution presented in this paper is absolutely novel in the literature as it enriches and extends a recent related and consolidating field of papers concerning the impact of reputational risk on corporate performance. The focus in those papers is however on banking and finance and not on randomized experiments. Kölbel and Busch (2013) document how negative media attention (proxied by the RepRisk index) tends to worsen credit risk. Minor and Morgan (2011) show that the positive reputation of high CSR firms helps them absorb the shock of the negative event of product recalls. Deng, Kang and Low (2013) find that the negative effect of stakeholder conflicts in merger is reduced by high CSR. In most papers in this literature CSR is mainly viewed within the governance domain, and its positive/negative effect works through the channel of trust. Hence, the reaction of the market to low responsibility does not indicate other-regarding concerns but rather the fear that low CSR may lead in the future to poor corporate conduct, thus generating economic losses to consumers and investors.

Our paper is the first one to look at those aspects of CSR directly concerning environmental and social responsibility along the product chain. As such, these aspects are much less likely to be related with final consumers self-regarding concerns. In addition to this, the field experiment design helps to solve the causality problems often encountered in the above mentioned literature. At the same time, our field experiment does not suffer from the limitations to external validity that are typical of laboratory experiments. Last but not least, the focus on final consumers is consistent with the growing awareness that consumers' decisions may be very relevant for orienting corporate behaviour, as shown by global surveys. In 2013 The Eurobarometer asked representative samples of citizens of the 27 EU countries "who should take the leading role in influencing companies' action" (Eurobarometer, 2013). The most frequently selected answer (49 percent) was "citizens themselves through the purchasing decisions they make", followed by "management of companies through the decision they make about what the company does" (40 percent), public authorities through policies and regulations (36 percent), trade unions (28 percent), investors (22 percent), and NGOs (12 percent). In this perspective it is of foremost importance to understand how consumers react to information stimuli on CRS as we do in our field experiment.

A closer reference to our work is a very limited group of papers testing the effect of green advertising in field experiments. Among them, Hainmueller, Hiscox and Sequeira (2015) show that the two most popular coffee brands in the supermarket where the experiment is held experience an increase in sales by almost 10 percent under a treatment represented by a Fair Trade label as compared to a generic placebo label. In a second label-plus-price experiment they find that sales of the higher price coffee brand are not significantly different after an 8 percent price increase, while demand for the lower priced brand is more elastic since the price increase produces a 30 percent decline in sales. In another field experiment aimed at testing the willingness to pay in online auctions, Hiscox, Broukhim and Litwin (2011) find that shoppers on eBay paid a 23 percent premium for Fair Trade labelled coffee. The results from these field experiments are consistent with the literature showing that reference to social norms has strong effects on pro-social behaviour (Griskevicius et al., 2006; Goldstein and Cialdini, 2008). Our work in this field is however original since there is no contribution in this literature testing something similar to the impact of the Oxfam

Behind the Brands campaign and, more generally, of an articulated set of scores on CSR on top world companies.

Based on the information available from the campaign, under the assumption of standard (purely self-regarding) consumer preferences, we formulate the null hypothesis of no effect of such information on related product sales since our treatment changes neither the consumers' choice set, nor product prices. For this reason, under the above mentioned assumption, there is no reason for a purely self-regarding consumer to deviate from her pre-information optimal bundle of products.

We also consider the possibility that for two of the seven domains (Transparency and Climate) the ranked companies' behaviour along the product chain may have indirect effects on the self-regarding preferences of final consumers in a high-income country such as Italy where the experiment is held. We however show in a game theoretical setting that, even in this case, under reasonable parametric conditions, the optimal "free riding" consumers' strategy is not changing their pre-treatment choice (see section 3 and Appendix B).

Given this general framework we formulate three null hypotheses. First, we test whether the impact of the Behind the Brands scores is significant and consistent with the company's rank. Second, we test whether the marginal increase in the total score is significant per se. Third, we verify the effect of the treatment on non-ranked companies.

Our econometric findings show that the null of insignificance of the poster treatment is violated under three main respects. First, the scorecard poster treatment tends to have positive and significant effects on the market shares of the top ranked company, and negative and significant effects on those of bottom ranked companies with only one exception. Second, the marginal increase in the total Behind the Brands score has a positive and significant effect on the market shares of ranked companies. Third, the treatment is not neutral on the main non-ranked companies since the latter experience a negative and significant effect on their market shares.

Our results find support for the three above mentioned statements and have straightforward policy implications. If public information on CSR available at shops has a significant effect on consumers' choices, proper information on social and environmental responsibility of products may contribute to the achievement of social and environmental goals set by policymakers, alongside the more traditional policy tools of regulation and taxes. This type of policy intervention has much lower costs and exploits the leverage that a minority of consumers with other-regarding preferences can have on market sales and corporate conduct.

2. The Oxfam Behind the Brands campaign

The Oxfam Behind the Brands campaign focuses on the sourcing policies of the 10 largest food and beverage companies in the world (Associated British Foods (ABF), Coca-Cola, Danone, General Mills, Kellogg, Mars, Mondelez, Nestlé, PepsiCo, and Unilever) according to the Forbes 2000 annual ranking. Aggregate yearly revenues of these companies amounted at the beginning of the campaign (i.e., 2013) to around \$450 billion, the equivalent of the GDP of all world low-income countries in the same year.

The campaign consists of collecting information and creating aggregate scores from a large set of indicators in the following seven domains³

1. Transparency at a corporate level;
2. Women farm workers and small-scale producers in the supply chain;
3. Workers on farms in the supply chain;
4. Farmers (small-scale) growing the commodities;
5. Land, both rights and access to land and sustainable use of it;
6. Water, both rights and access to water resources and sustainable use of it;
7. Climate, both relating to reducing greenhouse gas emissions and helping farmers adapt to climate change.

Indicators are based on information retrieved from publicly available documents. For six of the seven domains (transparency excluded) they fall into the following four categories

1. Awareness: Does the company demonstrate general awareness of key issues relating to that theme and does it conduct projects to understand and address these key issues?
2. Knowledge: Does the company demonstrate it measures, assesses and reports key issues and facts specifically in its supply chains that relate to that theme?
3. Commitments: Does the company commit to addressing the key issues relating to that theme in its supply chains?
4. Supply chain management: Does the company require its suppliers to meet relevant standards related to that theme?

As it can be inferred from these definitions the four categories seek to measure an increasing engagement in the social and environmental issues, from general awareness of the problem to the monitoring and enforcement of the supply chain's conformity to high social and environmental standards.

Information used to create indicators in the first (Transparency) domain is different from the above since it has a broader focus and involves disclosure on issues that may simultaneously involve several of the remaining six domains.

An interesting characteristic of the scores we select for our field experiment is that they focus on a specific “downstream” and limited domain of CSR (agricultural sourcing policies), that is expected to be more distant from the self-interest of consumers of the final product. The scores do not in fact consider “upstream” domains of corporate responsibility such as corporate philanthropy that can create benefits for local communities in shopping places or workers' and environmental sustainability in final consumers' country. In this sense it is more difficult to argue that the rejection of the null (indicating that consumers are affected in their choices by the revelation of Behind the Brands scores) can be related to self-regarding preferences. In this respect, as is well known from the literature, concern and sensitivity for wellbeing of foreigners and distant people decline significantly during negative business cycle spells when economics tend to be considered as a fixed cake activity (Becchetti, Castriota and Rossetti, 2009). This makes our test even more relevant if we consider that our analysis is run at the end of a six-year recession producing a fall of around 14 percent of Italian average household income (OECD, 2015).

³ Descriptions of domains are retrieved from the campaign website www.behindthebrands.org.

In our paper we investigate whether the impact of this campaign and similar CSR scoring initiatives may be stronger if the information is made available for consumers not just online but also on the shop floor. The hypothesis is tested in a field experiment. In what follow we outline the theoretical background of our field experiment, describe its design, and present and discuss descriptive and econometric findings.

3. Theoretical background and hypothesis testing

We assume an economy populated by rational⁴ maximizing consumers who are choosing their optimal bundle of products before receiving information on the Behind the Brands campaign. More specifically, when entering the supermarket the i -th consumer solves the following straightforward utility maximization problem

$$\text{Max } U_i(\mathbf{x}, \delta)$$

$$\text{s.t. } Y_i = \mathbf{p}\mathbf{x}$$

where \mathbf{x} is the vector of goods available in the supermarket shelves that enter significantly the consumer's utility function, δ is an argument generically capturing other-regarding preferences (ie. inequity aversion, care for other individuals, care for the environment, etc.), \mathbf{p} the vector of product prices and Y is the consumer's income. In order to test for the existence of other-regarding preferences we consider how consumers would behave in case of $\delta=0$, formulate our testable null hypothesis on this basis and test with our randomized experiment whether the null is accepted or rejected.

Under $\delta=0$ the solution of the problem yields the following optimal pre-information choice vector

$$\mathbf{x}^* = f(\mathbf{p}, Y_i)$$

Consumers know product prices but are imperfectly informed about corporate behaviour along the supply chain.

Our treatment consists of reducing this specific dimension of consumers' imperfect information by installing the Behind the Brands poster scorecard with information on the social and environmental responsibility of the ten largest world food companies at the entrance of the supermarket. More specifically, as explained in section 2, information revealed with the experiment concerns two wellbeing dimensions. The first is wellbeing of other distant individuals (i.e. the three dimensions of Workers, Farmers and Women) or other environmental dimensions (i.e., Water and Land) in distant countries that we assume should not bring any direct contribution to final consumer's utility in case of purely self-regarding preferences ($\delta=0$). Any deviation from the *ex ante* optimal choice \mathbf{x}^* therefore implies in this case the presence of other-regarding preferences. This is because the scorecard poster treatment changes neither the prices nor the set of opportunities available to consumers. Hence any deviation from the *ex ante* optimum implies (in absence of any other-regarding component) the disutility of moving to a lower multi-dimensional indifference surface. Hence, if consumers are rational, this potential disutility must be more than offset by satisfaction of

⁴ In the sense of consistent choice of means in order to achieve desired goals.

an other-regarding preference argument (i.e. concern for poor workers along the supply chain, for their equal opportunities, or for environmental dimensions such as water and land).

The second wellbeing dimension concerns the corporate contribution to global public goods that can be enjoyed by the same final consumers. This dimension is particularly captured by the Climate and Transparency domains, as they might be related to overall corporate conduct affecting also final consumers. In such a case the consumer may be aware that choosing products with high scores in these two domains may produce a positive externality on the availability of global public goods that can increase her utility.

Even in this last case, with $\delta=0$, the rational consumer who receives information on the higher/lower corporate responsibility of a company happens to be in a “vote-with-the-wallet” prisoner’s dilemma (see Appendix A and Becchetti and Salustri, 2015). By costly deviating from her optimal pre-information choice she can contribute to the creation of a public good (i.e. environmental sustainability or transparency) which she also enjoys. However, as in a standard multi-player prisoner’s dilemma, the dominant strategy is maintaining her previous choice even though coordination with other players/consumers and choice of the more responsible product is Pareto superior. This is the case under the reasonable assumption that a single contribution to the positive externality (when voting with the wallet) has costs of deviating from the pre-information optimal choices higher than the benefits. This is the case under the reasonable assumption that the individual marginal contribution to the production of the public good is negligible given the large number of participants to the game in mass consumer markets.

The purely self-regarding consumer should therefore not deviate from her optimal pre-information choice even in this case. This is because the information does not imply changes in prices and the only change of choice that can positively affect her self-regarding utility concerns a public good component for which however the social dilemma dominates⁵.

Our conclusion is therefore that significant changes from pre-information optimal choices can only be interpreted as revealing the presence of non purely self-regarding preferences ($\delta \neq 0$) when they are generated by an information signal such as that of our treatment that does not alter the set of opportunities, income and relative prices.

4. Experiment design

The experiment involves four grocery stores of the biggest Italian grocery store chain called Coop. The stores are located in Tuscany and, more precisely, in Firenze, Lucca, Pisa, and Siena.

⁵ The information placed at supermarkets’ entrances may be eventually interpreted as a very strong coordination signal modifying expectations in the direction of a higher number of expected consumer choices for products of the more responsible companies. Even in this case the consumer that modifies such expectations still has the choice of not moving from its pre-treatment choice as her dominant strategy, given the negligible effect of her individual decision in a mass consumer market game where a large number of players participate.

We apply a two-group, two-phase crossover design (Jones and Kenward, 2003) and randomly assign each store to a group corresponding to the treatment-control or the control-treatment experimental sequences. The first phase started on 30th May, 2016 and was in place for 4 weeks, after which stores started the second 4-week phase that ended on 24th July, 2016. The experiment lasted 8 weeks in total.

During the control period no intervention was done and the store employees as well as the customers did not know that we were registering sales for the experiment purpose. In the treatment period we placed at the main entrance of each treated store a large poster (2m height, 1m width) reporting the Oxfam ranking of the 10 biggest world food companies according to their performance in the seven CSR domains (the original poster in Italian is reproduced in Figure 1 with the English translation attached). The poster was placed at the main entrance and occupied part of the doorway so that each customer entering the store could see it. The poster had a specific binder containing fliers reproducing the same poster in smaller size and reporting the Oxfam campaign website on the one side and a short explanation of the campaign on the other side (Figure 2). Each store was endowed with 1,000 fliers and remained on average with less than 100 fliers at the end of the experiment. During the treatment, workers of each store did not know the details of the project and were instructed not to provide any explanation to customers who would ask for information about the poster.

5.1 Descriptive statistics

To provide a summary view of our descriptive findings we report the weekly sales in the stores selected for our experiment at brand level. In Table 1 we show the number of brands for each company and the frequency of weekly observations for each product brand. The number of observations varies according to the number of different products sold under each brand (i.e. different types of Algida ice-creams under the Algida ice-cream brand) and the availability/unavailability of each product in the given supermarket place. As expected Unilever and Nestlé have the highest number of brands. Other companies have much fewer brands sold in the shops where the experiment is held (Kellogg's has two brands while ABC has only one brand: Twinings tea). Note that the companies involved in the Behind the Brands experiment are nine and not ten since the Coop supermarkets where the experiment takes place have no products on their shelves for one of the ranked companies (General Mills).

Table 2 displays average market shares at brand level for each company and total sales at company level in the treatment and control periods. From this table we see that the top ranked brand (Unilever) experiences a growth in sales of around 10 percent with the treatment and a similar 10 percent increase in average market share at brand level. At the same time total sales of companies ranked at the bottom tend to fall. In order to test whether these descriptive differences are significant we need to control for price effects, product/store specific fixed effects and week effects as we will do in the econometric analysis presented in the section that follows.

5.2 Econometric specification and hypothesis testing

We test econometrically the effect of the publication of scores of the Behind the Brands campaign on the scorecard poster treatment by using the following specification

$$\delta_{r,i,k} = \alpha_0 + \sum_j \alpha_{1j} Treat * BtBCompany_j + \sum_m \alpha_{2m} Treat * NonBtBCompany_m + \sum_i \alpha_{3i} Price_i + \sum_k \alpha_{4k} DWeek_k + \sum_l \alpha_{5l} DBrandStore_l + \varepsilon_{r,i,k} \quad (1)$$

where $\delta_{r,i,k}$ measures the market share of product r of brand i at week k , $BtBCompany$ is a (0/1) dummy for the j -th company ranked in the Behind the Brands campaign, $Treat$ is a dummy taking value one in the treatment period and zero otherwise, $NonBtBCompany$ is a (0/1) dummy for the six largest companies having products sold in the experiment selling places and not ranked in the Behind the Brands campaign, $Price$ is the price for each product r of brand i , $DWeek$ is a (0/1) dummy for week k , $DBrandStore$ is a (0/1) dummy picking up the l -th brand/store fixed effect. Among the controls, price levels capture the influence of brand products unit prices on brand product market shares. Week effects capture common factors affecting sales time dynamics such as average weather conditions of the specific week (i.e. higher market shares of ice-creams if the temperature is higher) and any news that may affect consumers' behaviour. Brand/store fixed effects capture idiosyncratic time invariant components related to brand related consumption habits of the given shops and product characteristics.

Based on (1) our first null hypothesis is

$$H_{01}: \sum_j \alpha_{1j} = 0$$

The null implies the joint irrelevance of the treatment on treated companies and its rejection implies that the treatment has significant effects on ranked companies' average product market shares.

Our second null hypothesis is

$$H_{02}: \sum_m \alpha_{2m} = 0,$$

The null implies the joint irrelevance of the treatment on non-treated companies having products sold in the shops where the experiment takes place, and its rejection implies that the treatment has significant effects on non-ranked companies' average product market shares.

An alternative specification where we test the marginal effect of the total Behind the Brands score is

$$\delta_{r,i,k} = \beta_0 + \beta_1 TotalScore + \beta_2 Treat * TotalScore + \sum_k \beta_{3k} DWeek_k + \sum_l \beta_{4l} DProductStore_l + \varepsilon_{r,i,t} \quad (2)$$

where $TotalScore$ is the total score for each company in the Behind the Brands campaign and the other regressors are defined as in (1). The analysis here is limited to products of companies ranked in the Behind the Brands campaign.

Based on (2), we test the following null hypothesis

$$H_{03}: \beta_2 = 0,$$

The null implies the irrelevance of the total score, while its rejection on the positive side implies that a unit increase in the Behind the Brands total score has a positive and significant effect on average product market shares of the ranked companies.

5.3 Econometric findings

Findings on the impact of our treatment in a sample including observations of weekly sales of all products sold in the treated supermarkets are presented in Table 3. In the first specification we test the treatment effect on the ten companies covered by the Behind the Brands Oxfam's campaign (column 1), while in a second specification (column 2) we use the fully augmented specification in (1) and also introduce dummies capturing the effect of the treatment on the most relevant selected companies not included in the ranking (Coop, Barilla, Lavazza, Mukki, Sarmontana and Ferrero). A first important finding is that the ranking matters since six out of the nine company dummies interacted with the treatment dummy are significant (the F-test on the joint significance of the $Treat * BtBCompany$ dummies is $F(9, 156436) = 76.27$, p-value = 0.0000, indicating rejection of the first null hypothesis H_{01} in section 5.2) in the first specification controlling for prices, week effects and product-store fixed effects. The result remains significant when we introduce the non-ranked company treatment-interacted dummies ($NonBtBCompany$ variables in column 2).

In addition to this general result we have more specific findings. First, our treatment produces a 6 percent increase in the market share of the top ranked brand (Unilever). What is interesting as well is that the companies ranked second and third (Nestlé and Coca-Cola) experience insignificant changes in their market shares, while the impact on the 4th and 5th brands (Kellogg's and Mars) becomes positive again. An interpretation for these combined findings is that the strong negative reputation of Nestlé and Coca-Cola at the international level and in Italy among those types of consumers who regularly shop at Coop supermarkets and who are in general more critical toward multinational companies. This negative reputation is likely to undermine and to invalidate the good news of their high rank in the Behind the Brands campaign.⁶ Beyond the heterogeneity of impact described above, a rank in the top five of the Behind the Brands campaign has an overall positive and significant impact since the null of no impact is rejected on the positive side ($F(5, 156436) = 100.69$, $Prob > F = 0.0000$).

⁶ An indication of the negative perception of Coca Cola and Nestlé in the general public may be found in the existence of a specific Wikipedia item related to such criticism. On the item "criticism of Coca-Cola" it is possible to find information about most of the negative corporate responsibility issues related to the company (https://en.wikipedia.org/wiki/Criticism_of_Coca-Cola). The Nestlé case is even more clear cut since the company suffered and is still suffering a word boycott campaign related to the aggressive marketing" of breast milk substitutes, particularly in less economically developed countries (LEDCs), largely among the poor. The Wikipedia voice "boycott Nestlé" dedicated to it can be retrieved at https://en.wikipedia.org/wiki/Nestl%C3%A9_boycott. Even though Wikipedia pages are not scientific proofs, the two explicitly negative Wikipedia pages related to the two companies are a clear-cut indication of their relatively higher negative perception in the general public. And perception is what matter in our experiment. To compare this evidence with what concerns the top ranked Behind the Brands company it is impossible to find a Wikipedia voice on Unilever boycott or criticism of Unilever. Criticism on Coca-Cola and Nestlé is therefore expected to be widespread among the most socially conscious consumers and customers of Italian coops are among the latter.

A third important finding is that our treatment produces negative effects on companies ranked between the 6th and the 9th (last) position (Mondelez, General Mills, Danone)⁷ with the exception of Associated British Food (ABC) where the impact is surprisingly positive, even though only weakly significant. What may matter here is that, as shown in Table 1 where we list products for each company sold in the treated supermarkets, ABC has only one product on supermarket shelves and this product (Twinings tea) is not easily identifiable with the ABC company. Furthermore, this product has a strong ethical reputation among Italian and world consumers, made salient by our experiment that induces consumers to focus on corporate social and environmental responsibility.⁸ In spite of this exception, a ranking in the last four places of the Behind the Brands campaign produces a negative and significant effect since the null hypothesis of no impact is rejected on the negative side ($F(4, 156436) = 56.62$, $\text{Prob} > F = 0.0000$). Findings from the second specification (Table 3, column 2) confirm all the above results but provide additional evidence of a negative (even though small in magnitude) effect on companies not covered by the Behind the Brands campaign when we select the first six non-ranked companies in terms of total sales in the selected supermarkets (Coop, Barilla, Lavazza, Sammontana, Mukki and Ferrero) (the joint test of their significant difference from zero is $F(9,156430) = 315.57$ (0.000), $\text{Prob}>F=0.0000$). Hence our second null hypothesis (H_{02}) on the irrelevance of the experiment for non-treated brands is rejected in direction of a negative effect. This implies that the “invisibility effect” generated by not being among the ranked companies works negatively. A likely interpretation is that the positive effect on top ranked companies can erode market shares of the excluded brands.

In interpreting our findings we must consider that rejection of the null is particularly remarkable given two offsetting factors that should go in the opposite direction. On the one hand, the shops where we perform our experiment are coop supermarkets and therefore they are usually attended by a selected and socially motivated sample of consumers, most of whom are Coop shareholders. We therefore expect that these consumers may already be aware of some of the social and environmental concerns raised by the campaign and incorporate them in their pre-treatment choices. On the other hand the experiment is run in 2016, that is, after a six-year recessionary spell that led Italians to lose on average 14 percent of their per capita household income after the 2008 financial crisis (OECD, 2015). We may reasonably expect that the crisis has made Italian consumers less sensitive to social and environmental issues and relatively more price sensitive than during more positive business cycle periods.

As a robustness check on our main findings, we consider that the Behind the Brands campaign is focused on food while the 10 ranked companies also produce non-food products. We therefore

⁷ General Mills and Danone are the only two companies having at least one score of two (the minimum assigned by the campaign).

⁸ The Guardian discusses the disappointing performance of ABC arguing that the company “does a disservice to the group because, in reality, it has some highly respected ethical enterprises among its portfolio. Twinings for instance has forged a solid reputation as a founder member of the Ethical Tea Partnership.” (<https://www.theguardian.com/sustainable-business/associated-british-foods-transparent-nestle-coca-cola>). This article clearly shows that the reputation of Twinings tea is different from that of ABC. Hence, it is reasonable to expect that Coop consumers do not easily reconnect the ABC score to the unique ABC brand (Twinings tea) sold in Coop supermarket and focus instead of the ethical strength of the latter that becomes more salient with the experiment.

disentangle the treatment effect on food and non-food products in an augmented specification (Table 3, columns 1 and 2). Our findings show that the treatment effect is concentrated on food products. Consumers hence correctly link their behaviour to the specific object of the Behind the Brands campaign (the international food product chain), while the reputational effects on non-food products of the same companies are not significant.

It should also be noted that the information obtained with our treatment is much richer than just a ranking among the 10 biggest world food companies, since we also have detailed (1-10) scores in the seven different domains covered by the campaign (Transparency, Women, Workers, Farmers, Land, Water, Climate). We therefore test whether the absolute score values matter in a different specification where the brand dummies disappear and we simply introduce a baseline total score variable (*TotalScore*) plus a total score variable interacted with the treatment dummy (*Treat*TotalScore*) (see specification 2 in section 5.2). Note that in this case the number of observations is far lower since we exclude from the analysis the products of all non-ranked brands.

Our findings show that both variables (baseline and treatment interacted total score) are significant, which leads to the rejection of our third null hypothesis (H_{03}) (Table 5). The significance of the baseline total score variable (*TotalScore*) may have three interpretations: i) it simply reflects that, for reasons unrelated to their CSR reputation, companies at the top of the ranking have higher market shares; ii) it captures a reverse causality effect between CSR and performance where top performers (assuming that market shares in our selected supermarkets coincide with aggregate world market shares) have more resources to dedicate to CSR;⁹ iii) it proves a direct causality effect where CSR has a positive impact on performance. An investigation on which of the three possible interpretations applies is however beyond the scope of the present research, that focuses on the effect of the treatment. In this respect the significance of the total score variable interacted with the treatment dummy shows that the treatment (informing customers about the Behind the Brands scores) has positive and significant effects on sales. This finding confirms previous results on hypothesis one showing that attracting consumers' attention on the Behind the Brands scores produces effects on sales in the expected direction.

We have argued in our theoretical background to the field experiment that rejection of the null of H_{01} (and H_{03}) implies the presence of other-regarding preferences. We however considered that two of the Behind the Brands domains (Climate and Transparency) may be suspected of affecting also the utility of final consumers. We therefore replicate the estimations of Table 5 with total scores computed after excluding these two domains. Note that the ranking of the 10 companies is slightly modified after this change (Table 6). Results from the specification using the modified total score do not change significantly and the treatment interacted total score variable remains positive and significant (Table 7).

In a final robustness check we wonder whether the treatment effect persists after the poster scorecard is removed.¹⁰ We therefore introduce in specification (2) a post-treatment dummy taking value one in the last two months of our experiment time spell for the two supermarkets in which the

⁹ Empirical evidence on a causality nexus going from corporate performance to CSR is provided by Hong, Kubik and Scheinkman (2012).

¹⁰ We basically remove in this respect the hypothesis of no carry-over assumption and assume that consumers have memory of the past treatment also in the following control period in which the shelf poster is removed (in stores where the treatment phase comes before the control phase). Note however that the violation of the no carry-over assumption would produce a downward bias in our findings therefore making the observed significance of the treatment effect even sharper.

treatment is introduced in the first two months of our experiment period (and obviously introduce as well the post-treatment baseline time dummy taking value one in the last two months and not interacted with the treatment dummy). We find that the total score treatment effect remains significant and that the post-treatment effect is positive and significant as well even though smaller in magnitude (Table 8).

5. Conclusions

By choosing to pursue corporate social and environmental responsibility, companies may contribute to the achievement of social and environmental goals. They may however be reluctant to follow this course of action due to the high costs and limited benefits of this choice. Provision of proper information on their responsibility scores may however help in changing this negative cost-benefit balance if it influences consumers' choices in the expected direction, i.e. by generating higher sales for more responsible companies. In our paper we assess whether this is the case with a randomized field experiment where we test the salience of the Behind the Brands campaign when this information is made available to consumers with a scorecard poster of the ten largest world food companies placed at the entrance of a selected number of supermarkets.

Findings of our experiment show that the null hypothesis of the joint insignificance of the poster effect on treated supermarket sales of the ranked companies is rejected. More specifically, the top ranked company experiences a six percent increase in its market share and, in addition to it, several other brands are affected in relation to their position in the rank, with those at the bottom registering in general a negative and significant effect. We also show that an increase in the total score produces a positive and significant impact on market shares. The effect of the treatment is concentrated on food products, consistently with the target of the Oxfam campaign.

It is remarkable that the above mentioned results are obtained at the end of a six-year recession period in Italy which led to an aggregate loss of around 14 percent of household income (OECD, 2015), since the adverse economic conditions in which our experiment is held should reduce the room for factors different from prices and economic convenience in consumer choices.

Based on the theoretical background of the experiment described in the paper we argue that our empirical findings provide evidence in favour of the presence of other-regarding preferences. This is because our experimental setting does change neither prices nor the choice set of consumers, and the campaign domains are mostly related to corporate conduct along the supply chains on issues not directly concerning self-interest of final consumers.

The main policy implication of our experiment is that social and environmental goals of the policymakers may be in part achieved without costs for the government budget, by just bringing consumers closer to the perfect information assumption of textbook economic models. This is because, when information on CSR is provided, a share of consumers with non-other-regarding preferences modifies their choices by increasing (reducing) purchases of top (bottom) CSR brands. This goal can be achieved by providing information at consumer places on CSR scores of product brands. The effect of such information on market sales and, more specifically, the positive impact of social and environmental responsibility, may increase CSR benefits on corporate economic performance thereby creating an incentive for its implementation at corporate level. The issue of

properly defining high/low standards of social and environmental responsibility obviously arises here. We did not address this problem in the paper since we were simply interested in measuring the effects of publicizing the rankings based on the criteria defined by Oxfam without discussing their merit.

Some caveats however emerge from our analysis, since the experimental findings also include some apparently paradoxical results in the relation between the Behind the Brands ranking and impact on sales. These results may however be related, in one case, to the difficulty of linking brands to companies and to the different reputation between companies and brand (the Twinings tea/ABC case), or, in the two other cases, to consumers' a priori beliefs and the reputation of some companies (the Nestlé and Coca-Cola case). This implies that the significance of policies based on the experiment treatment is mediated by consumers' a priori and by its capacity of linking brands to products (that the online Behind the Brands website allows to do while our scorecard poster does not). In addition to it, the slight negative "invisibility" effect related to the small market share loss of companies not present in the ranking may reduce the incentive of the supermarkets to follow the policy.

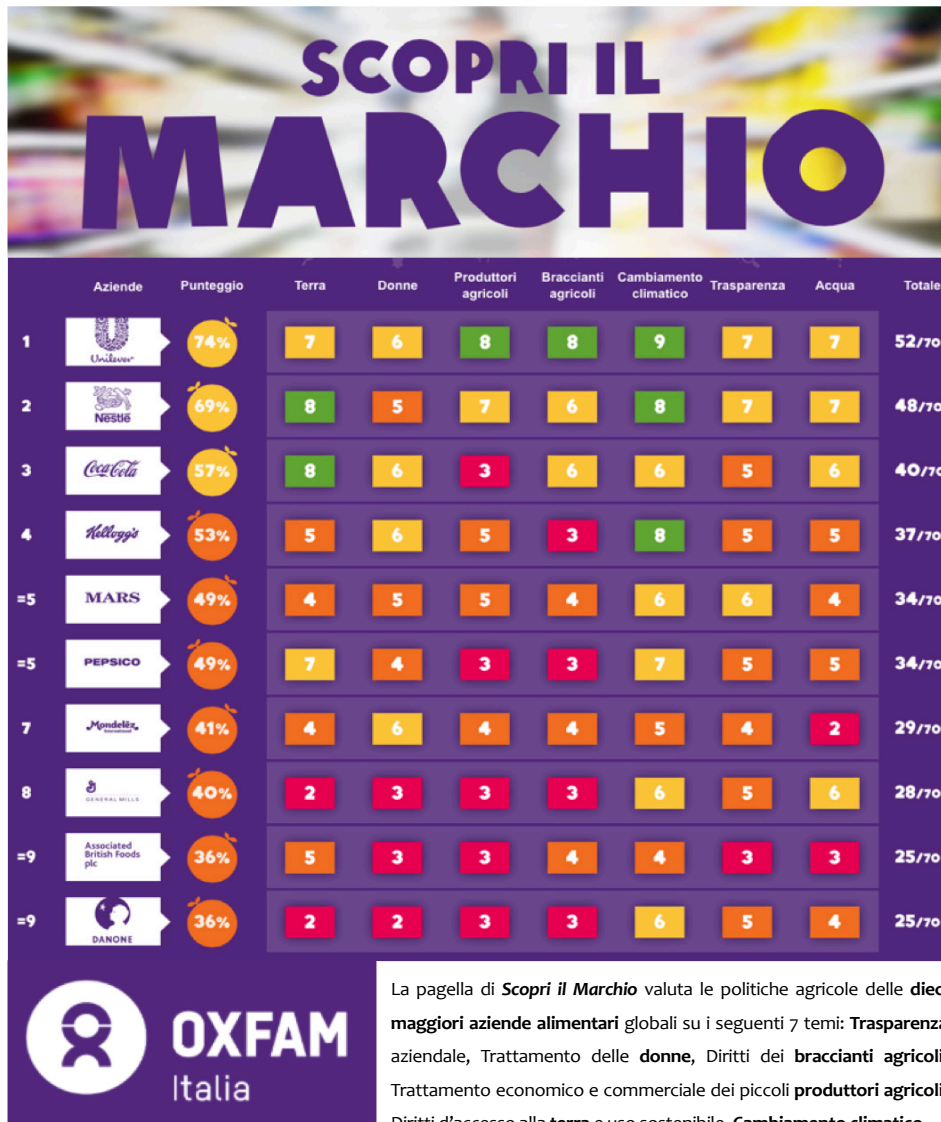
As a general conclusion, our findings reveal that the potential effect of more widespread information on corporate reputation to the general public is huge. The need for high quality standards for such information in order to avoid the undesired effects of manipulation and post-truths on consumer markets is therefore another crucial related issue that may inspire future research.

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Figure 1 Scorecard of the Oxfam Behind the Brands campaign posted at supermarket entries in the field experiment (in Italian)



Per saperne di più consulta il volantino o visita www.behindthebrands.org/it-it/

Meaning of the scores given by the Oxfam's campaign: 8- 10: Good; 6- 7; Fair: 4 – 5; Some progress: 2 – 3; Poor: 0 – 1: Very poor.

(translation into English)

	Land	Women	Farmers	Workers	Climate	Transparency	Water	TOTAL
<i>Unilever</i>	7	6	8	8	9	7	7	52
<i>Nestlé</i>	8	5	7	6	8	7	7	48
<i>Coca Cola</i>	8	6	3	6	6	5	6	40
<i>Kellogg's</i>	5	6	5	3	8	5	5	37
<i>Mars</i>	4	5	5	4	6	6	4	34
<i>Pepsico</i>	7	4	3	3	7	5	5	34
<i>Mondelez</i>	4	6	4	4	5	4	2	29
<i>General Mills</i>	2	3	3	3	6	5	6	28
<i>Associated British Food</i>	5	3	3	4	4	3	3	25
<i>Danone</i>	2	2	3	3	6	5	4	25

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Figure 2 Position of the Behind the Brand scorecard at supermarket's entry



Table 1 Brands and sales of the companies ranked in the Oxfam Behind the Brands campaign (period 30 May 2016 – 24 July 2016)

Brand	Sales (€)	%*			
			Snickers	244.77	
			Twix	476.85	
<i>Unilever</i>	250,486.599	3.51	Whiskas	11,679.75	
Coccolino	5,968.43		Perfect Fit	1,160.92	
Algida	11,629.82		Catisfaction	684.75	
Mentadent	23,255.7				
Knorr	18,534.91		<i>Pepsico</i>	12,475.63	0.17
Dove	20,393.57		Gatorade	3,211.82	
Svelto	10,655.51		Pepsi	5,433.78	
Lysoform	11,859.99		Seven Up	149.52	
Fissan	2,701.98		Lay's	3,680.51	
Badedas	1,480.82				
Cif	6,380.24		<i>Mondelez</i>	121,422.47	1.70
Clear	1,826.35		Kraft	1,594.42	
Calve'	15,804.62		Saiwa	3,723.72	
Lipton	3,905.1		Philadelphia	40,241.63	
Axe	479.69		Milka	6,907.68	
Carte D'or	20,908.72		Toblerone	159.68	
Sunsilk	6,557.11		Oro Saiwa	26,763.22	
Glysolid	722.77		Ritz	852.67	
Cornetto	38,310.34		Tuc	6,685.98	
Magnum	45,283.13		Figaro	497.29	
Zendium	3,827.79		Halls	955	
			Nabisco Oreo	1,962.7	
<i>Nestlé</i>	160,918.06	2.25	Sottilette	28,617.26	
Buitoni	72,091.91		Mikado	2,461.22	
Fruttolo	6,619.6				
Nestlé	8,766.3		<i>Associated British Food</i>	8,245.3	0.12
Mio	7,935.93		Twinings	8,245.3	
Smarties	485.15				
Belte'	2,499.96		<i>Danone</i>	104,671.74	1.47
Galak	332.2		Danone	6,892.68	
Lc1	1,544.67		Actimel	14,684.68	
Nesquik	8,255.79		Activia	41,973.67	
Vera	4,714.36		Danette	3,198.79	
Orzoro	2,768.43		Vitasnella	14,193.72	
Nescafe'	27,521.21		Danacol	16,210.99	
Baci	3,190.74		Vitasnella Danone	7,517.21	
Fruit Joy	225.33				
Kit Kat	824.59		<i>Coop</i>	1,419,099.14	19.88
Lion	183.06		Crescendo	53,022.9	
Maggi	602.25		Fior Fiore	165,096.3	
Nidina	754.73		Solidal	19,305.49	
Polo	416.95		Coop.	904,300.9	
Perugina	9,459.12		Club 4-10	872.23	
Bacetti Perugina	509.81		Vivi Verde	107,480.5	
Mare Fresco	1,215.97		Bene Si	69,207.07	
Total			Origine	48,171.96	
			Amici Speciali	43,090.92	
			Amici Speciali Premium	8,550.87	
<i>Coca Cola</i>	132,422.58	1.85			
Fanta	16,780.97		<i>Barilla</i>	181,268.61	2.54
Coca Cola	104,325.6		Barilla	1,109.3	
Powerade	3,066.19		Mulino Bianco	141,240.6	
Sprite	3,901.74		Pavesi	36,187.14	
Burn	1,636.82		Wasa	2,731.57	
Lilia	2,711.26				
			<i>Lavazza</i>	139,245.6	1.95
<i>Kellogg's</i>	57,575.86	0.81			
Kellogg's	48,539.82		<i>Mukki</i>	138,547	1.94
Pringles	9,036.04				
			<i>Sammontana</i>	100,321.6	1.41
<i>Mars</i>	47,797.96	0.67			
Uncle Ben's	18.88		<i>Ferrero</i>	103,917.28	1.46
M&M's	1,045.64		Ferrero	5,037.04	
Kitekat	6,281.5		Kinder	40,380.87	
Pedigree	6,138.97		Estathé	50,873.34	
Suzi Wan	261.75		Tic Tac	4,953.19	
Bounty	3,413.46		Tronky	1,631.02	
Cesar	5,111.01		Duplo	1,041.82	
Mars	2,813.54				
Sheba	8,466.17				

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Total	2,978,415.49	41.72
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* percent of sales on total sales in the shopping places selected for the experiment

Table 2. Weekly average market shares at brand level and weekly total sales for the Oxfam-ranked companies.

Variable	Obs	Control period				Treatment period				
		Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
<i>Unilever</i>										
Market share	2,696	0,033	0,002	0,030	0,039	2,675	0,036	0,006	0,028	0,048
Total sales	2,696	44,642	77,451	0,000	1109,920	2,675	48,647	104,683	0,000	1479,580
<i>Nestlé</i>										
Market share	2,388	0,022	0,003	0,016	0,025	2,428	0,023	0,004	0,016	0,030
Total sales	2,388	34,319	61,205	0,000	682,400	2,428	32,523	56,893	0,000	753,100
<i>Coca Cola</i>										
Market share	396	0,019	0,005	0,011	0,027	394	0,018	0,003	0,014	0,023
Total sales	396	168,348	307,692	0,360	1801,380	394	166,895	323,098	1,250	2235,200
<i>Kellogg's</i>										
Market share	466	0,008	0,001	0,006	0,010	466	0,008	0,001	0,007	0,010
Total sales	466	62,885	79,885	1,400	709,390	466	60,668	75,929	2,080	544,520
<i>Mars</i>										
Market share	833	0,007	0,002	0,004	0,010	892	0,007	0,002	0,005	0,010
Total sales	833	2,781	29,666	0,940	252,330	892	27,611	28,866	1,050	219,210
<i>PepsiCo</i>										
Market share	196	0,002	0,001	0,001	0,003	198	0,002	0,000	0,001	0,003
Total sales	196	33,152	25,603	3,710	127,670	198	30,191	28,282	0,800	167,130
<i>Mondelez</i>										
Market share	1	0,017	0,001	0,015	0,020	1,009	0,017	0,001	0,015	0,019
Total sales	1	61,496	141,056	0,950	1025,260	1,009	59,392	141,745	0,950	1717,690
<i>ABC</i>										
Market share	112	0,001	0,000	0,001	0,002	118	0,001	0,000	0,001	0,002
Total sales	112	37,361	33,875	2,500	165,700	118	34,414	27,714	2,500	128,800
<i>Danone</i>										
Market share	631	0,014	0,002	0,011	0,017	618	0,013	0,002	0,010	0,016
Total sales	631	79,657	144,751	0,530	1169,660	618	76,886	133,332	0,530	1298,720

Table 3. The effect of the Behind the Brands scorecard poster on companies' market shares.

	(1)	(2)
VARIABLES	Mkt shares	Mkt shares
Unilever*Treat	0.0614*** (0.00308)	0.0614*** (0.00308)
Nestlé*Treat	-0.00120 (0.00348)	-0.00120 (0.00348)
Coca Cola*Treat	-0.00323 (0.0117)	-0.00323 (0.0117)
Kellogg's*Treat	0.0180** (0.00735)	0.0180** (0.00735)
Mars*Treat	0.0783*** (0.00540)	0.0783*** (0.00540)
PepsiCo*Treat	-0.0710** (0.0304)	-0.0710** (0.0304)
Mondelez*Treat	-0.00777*** (0.00253)	-0.00777*** (0.00253)
Associated British Food*Treat	0.0323** (0.0150)	0.0323** (0.0150)
Danone*Treat	-0.0219*** (0.00300)	-0.0219*** (0.00300)
Coop*Treat		-0.00137*** (3.68e-05)
Barilla*Treat		-0.00138*** (9.91e-05)
Lavazza*Treat		-0.00156*** (0.000191)
Mukki*Treat		-0.00126*** (0.000125)
Sammontana*Treat		-0.00128*** (0.000186)
Ferrero*Treat		-0.00137*** (0.000125)
Brand/Store FE	Yes	Yes
Store FE	Yes	Yes
Week FE	Yes	Yes
Joint sign. of ranked brands	F(9, 156436) = 76.27 (0.000)	F(9, 156430) = 76.27 (0.000)
Joint sign. of non ranked brands		F(6,156430) = 315.57 (0.000)
Joint sign. of the top 4 ranked brands	F(4, 156436) = 100.69 (0.000)	F(4,156430) = 100.70 (0.000)
Joint sign. of the bottom 4 ranked brands	F(5,156436) = 56.72 (0.000)	F(5,156430) = 56.73 (0.000)
Observations	156,493	156,493
Observations		157,664
R-squared	0.99	0.99

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. The effect of the Behind the Brands scorecard poster on companies' market shares. (controlling for food vs non food effect)

VARIABLES	(1)	(2)
Unilever*Treat	0.0598*** (0.00387)	0.0598*** (0.00387)
Nestlé*Treat	-0.00120 (0.00348)	-0.00120 (0.00348)
Coca Cola*Treat	-0.00323 (0.0117)	-0.00323 (0.0117)
Kellogg's*Treat	0.0180** (0.00735)	0.0180** (0.00735)
Mars*Treat	0.0830*** (0.00883)	0.0829*** (0.00883)
PepsiCo*Treat	-0.0710** (0.0304)	-0.0710** (0.0304)
Mondelez*Treat	-0.00738*** (0.00256)	-0.00739*** (0.00256)
Associated British Food*Treat	0.0323** (0.0150)	0.0323** (0.0150)
Danone*Treat	-0.0219*** (0.00300)	-0.0219*** (0.00300)
Coop*Treat		-0.00145*** (5.08e-05)
Barilla*Treat		-0.00143*** (0.000103)
Lavazza*Treat		-0.00163*** (0.000203)
Mukki*Treat		-0.00131*** (0.000127)
Sammontana*Treat		-0.00134*** (0.000193)
Ferrero*Treat		-0.00142*** (0.000128)
Non food	-8.48e-05 (9.92e-05)	-0.000159 (0.000108)
Unilever*Non food*Treat	0.00293 (0.00440)	0.00301 (0.00440)
Mars*Non food*Treat	-0.00612 (0.00911)	-0.00606 (0.00911)
Mondelez*Non food*Treat	-0.00768 (0.00848)	-0.00761 (0.00848)
Coop*Non food		0.000241* (0.000123)
Joint significance of treatment on ranked Brands	F(9,156432) = 44.99 (0.000)	F(9,156425) = 44.94 (0.000)
Joint significance of treatment on non ranked Brands		F(6,156425) = 155.96 (0.000)
Joint significance of the top 4 ranked brands	F(4,156432) = 61.20 (0.000)	F(4,156425) = 61.12 (0.000)

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Joint significance of the bottom 5 ranked brands	F(5,156432) = 32.02 (0.000)	F(5,156425) = 32.00 (0.000)
Observations	156,493	156,493
R-squared	0.999	0.999

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 5. The effect of information on Behind the Brands total score on ranked companies' market shares

	(1)	(2)	(3)
VARIABLES			
Brand/Store FE	No	Yes	Yes
Store FE	Yes	No	Yes
Week FE	Yes	Yes	Yes
Totalscore	0.0497*** (0.000539)	0.120*** (0.000575)	0.226*** (0.00139)
Treat*Totalscore	0.000503*** (0.000149)	0.000596*** (4.10e-05)	0.000596*** (4.10e-05)
Observations	16,287	16,287	16,287
R-squared	0.449	0.977	0.977

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 6. The Behind the Brands scorecard without the self-regarding domains (Climate and Traspacency)

	Land	Women	Farmers	Workers	Climate	Transparency	Water	TOTAL
Unilever	7	6	8	8			7	36
Nestlé	8	5	7	6			7	33
Coca Cola	8	6	3	6			6	29
Kellogg's	5	6	5	3			5	24
Mars	4	5	5	4			4	22
Pepsico	7	4	3	3			5	22
Mondelez	4	6	4	4			2	20
General Mills	2	3	3	3			6	17

Associated British Food	5	3	3	4	3	18
Danone	2	2	3	3	4	14

Table 7. The effect of information on Behind the Brands total score on ranked companies' market shares (excluding climate and transparency).

	(1)	(2)	(3)
VARIABLES			
Brand/Store FE	No	Yes	Yes
Store FE	Yes	No	Yes
Week FE	Yes	Yes	Yes
Totalscore	0.0650*** (0.000715)	0.217*** (0.00185)	0.308*** (0.00189)
Totalscore*Treatment	0.000744*** (0.000209)	0.000877*** (5.99e-05)	0.000877*** (5.99e-05)
Observations	16,287	16,287	16,287
R-squared	0.448	0.977	0.977

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8. The effect of information on Behind the Brands total score on ranked companies' market shares (including after treatment effects)

	(1)	(2)
VARIABLES		
Brand/Store FE	Yes	Yes
Store FE	No	Yes
Week FE	Yes	Yes
DpostTreatment	0.0955*** (0.0123)	0.0955*** (0.0123)
Totalscore	0.144*** (0.000724)	0.224*** (0.00140)
Totalscore*Post treatment	0.00238*** (0.000287)	0.00238*** (0.000287)
Totalscore*Treatment	0.00286*** (0.000209)	0.00286*** (0.000209)

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Observations	16,287	16,287
R-squared	0.977	0.977

Appendix A Consumer choices when the responsible product contributes to a global public good

Assume that the Oxfam Behind the Brands treatment makes the consumer aware of the possibility of contributing to the creation of a global common good by modifying her/his choices (ie. by not buying anymore a product for which negative scores have been provided or starting to buy a product for which positive scores have been provided). Assume that the disutility from changing choices (ie. moving from the previous pre-treatment optimal choice to the new choice) is c , where c is equal to $U_{k1} - U_{k2}$ as in our two-dimensional case of Figure 1. Assume that the consumer has an other-regarding preference argument that produces an utility level (δ) in case of choice change toward a more responsible expenditure. Assume as well that the individual contribution to the global public good (transparency, climate) implied by the consumer choice is (b).

More in detail, following Becchetti and Salustri's vote with the wallet model (2015), the utility function for each j -th individual consumer may be written as

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}b + a - c & \text{if } S^i = vR \\ \frac{j}{n}b & \text{if } S^i = vS \end{cases}$$

where vR indicates the strategy of buying responsibly (ie. changing choices after having information from the campaign poster) and vS the strategy of buying conventionally (ie. not changing choices after having information from the campaign poster). The model conveniently and without lack of generality assumes that the global common good effect (b) is multiplicative on the share of consumers making the responsible choice.

Since we are in large consumer markets, n players are playing this game with n being very large. Only a small subset m of n is represented by consumers buying in the supermarket where the poster is exposed. Hence the consumer finds herself in a prisoner dilemma if

$$(1/n)b + \delta < c < \delta + b$$

where the optimal strategy is moving toward responsibility (reacting to the poster) only if $c < (1/n)b + \delta$.

The very large (n) in mass consumers market as those involved by our experiment brings the first addend at the LHS of the inequality close to zero. This implies that, even for small (c), a change in consumer choices after exposure to the poster is possible only if the consumer has nonzero other-regarding preferences or, more formally, with $c > 0$ and $\lim_{b \rightarrow \infty} \left(\frac{1}{n}\right)b = 0$, the inequality holds iff $a > 0$. Hence, even though the individual consumer knows that the purchase of a responsible product may contribute to a global public good producing a positive effect on her/his utility the optimal strategy is not to contribute given the Prisoner's dilemma problem in mass consumer markets. In essence, the consumer knows that she/he will fail to coordinate with the other world consumers and therefore her/his individual uncoordinated contribution to the global common good is so small to produce a benefit inferior to the cost (c) of switching to the responsible product.