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Abstract

We use the Vote-with-the-Wallet game (VWG) to model socially or environmentally responsible consumption, an increasingly relevant but still under-researched phenomenon. Based on a theoretical model outlining game equilibria and the parametric interval of the related multiplayer prisoners' dilemma (PD) we evaluate with a controlled lab experiment players' behavior in the game and test the effects of an ex post redistribution mechanism between defectors and cooperators. Our findings document that the redistribution mechanism interrupts cooperation decay and stabilizes the share of cooperators at a level significantly higher, even though inferior to the Nash equilibrium.

Keywords: vote with the wallet, prisoner's dilemma, lab experiment

JEL Numbers: C72 (Noncooperative games), C73 (Repeated games), C91 (Laboratory, Individual behavior), M14 (Corporate culture, Social responsibility).

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1. Introduction

The theoretical and empirical literature presents countless contributions to the understanding of the behavioral logic surrounding the prisoner's dilemma (PD). The evolution of economic life however continuously generates new varieties of the basic situation described by the PD game, which become empirically and politically relevant and worth of specific investigation. In this paper we explore theoretically and experimentally the phenomenon of socially and environmentally responsible consumption and how social and environmental responsibility may affect consumers' and investors' choices. We as well argue that the proper way to describe the phenomenon is using a "hybrid contribution-prisoners' dilemma" (Arce and Sandler, 2005), which we define as "Vote-with-the-Wallet" game (VWG henceforth).

The idea of the game comes from the fact that in the nowadays' complex and globalized economic system, consumers and investors face more and more frequently the alternative between buying a standard product vis-à-vis an equivalent socially or environmentally responsible product. When doing so they may (or may not) intrinsically enjoy the act of buying the responsible product per se if they have other-regarding preferences but they often have to pay an extra cost for it. Moreover, if they "coordinate" with a high number of other consumers in choosing the "responsible" product, the share of those buying responsibly grows and produces a positive externality for everyone in terms of more socially and environmentally responsible corporate conduct. However, and this is the core of the problem, the non-rivalrous, non-excludable (public good) component of this externality makes free riding more convenient, under a wide range of reasonable parametric conditions, and more so if the number of players gets large as is usually the case in consumer markets. As a consequence, exactly as in a typical PD, if everyone follows the dominant strategy of buying the standard product, the positive externality is not produced and each player is worse off with respect to the alternative equilibrium where everyone buys the responsible product.

In this paper we start by describing the VWG, and its potential real-life economic applications, outlining its equilibria and the area of the PD under reasonable parametric conditions. We then discuss some potential solutions to it in terms of an ex post redistributive mechanism, whose impact is tested with a controlled lab experiment. To this purpose we devise an experimental design where participants play both the basic VWG and its modified version incorporating a mechanism that redistributes ex post a share of payoffs from defectors to cooperators. To model such mechanism we focus on a feasible (balanced budget) redistribution where all defectors (participants buying the standard product) pay ex post a lump sum tax, which finances a fund that is in turn equally divided among cooperators (participants buying the responsible product).

A fundamental reference for our paper is the contribution of Fehr and Gacther (2000)[1]; they describe a public good game experiment in which participants may costly punish defectors thereby weakening the incentive to defect. The dynamic structure of our experimental task – 20 rounds where the same players play two different versions of the same game (in alternating order) – is similar to theirs. However, while their "policing" mechanism (private costly punishment) may be apt to mimic situations in which defectors actually infringe laws (or strong social norms), it is less apt to describe those situations (as ours) where defectors choose between two perfectly legal actions (buying the standard product or, alternatively, buying the responsible product which, we assume, may contribute more to society well-being). For this reason we choose a policy measure that resembles more closely to what actually occurs in our field of interest: an ex post government redistribution which can be applied when players' choices to defect or cooperate are observable. A valuable example of how this

[1] Fehr and Gächter (2000) document that their decentralized punishment mechanism has a large impact on cooperation in a public good game. Several contributions extend their work in various directions focusing on nonpecuniary sanctions (Masclet et al., 2003, and Noussair and Tucker, 2005), effectiveness of punishment (Nikiforakis and Normann, 2008) and the price of punishment (Anderson and Putterman, 2006, and Carpenter, 2007).

occurs in the economic reality are tax deductions for individuals opting for renewable sources of energy (i.e. installing solar panels) which are charged on the bills of those who remain on non-renewable sources. This approach is widely adopted in the reality since it inspires feed-in schemes that are currently followed in 64 jurisdictions worldwide (Couture and Gagnon, 2010). By associating the renewable source choice to the cooperative and the non-renewable choice to the defective strategies we obtain an example of an implementable ex post redistribution mechanism which may positively affect players' incentive to cooperate. A similar approach to that studied in our experiment may be adopted in other fields such as green consumption taxes, which differ from standard Pigouvian taxes since they work on the demand and not on the supply side. The case for a EU VAT reform in this direction is strongly supported by Albrecth (2006).[2]

The fact that these schemes are explicitly or implicitly implemented in some fields, and the ongoing debate for their extension to new fields, confirm the relevance of our research aimed at verifying how much they can alter the balance between defectors and cooperators in social dilemmas such as the VWG.

Our paper is divided into six sections (including introduction and conclusions). In the second section we provide synthetic evidence of the growing relevance of the "vote-with-the-wallet" phenomenon. In the third section we illustrate the VWG and its equilibria conditional on reasonable parametric assumptions. In the fourth section we describe our experiment design, while in the fifth section we present our empirical findings. The final section concludes.

[2] Along this line Marconi (2010) shows that in a two-country general equilibrium model with endogenous growth and trade an unilateral green consumption tax changes demand patterns and increases technological progress in direction of pollution abatement in both countries. A more specific application of a green consumption tax is proposed by Säll and Gren (2012) who calculate that the introduction of the latter on meat could decrease emissions of GHG, nitrogen, phosphorus and ammonia by a significant amount.

2. The empirical relevance of the VWG

According to the Boston Consulting Group "Responsible consumption" products accounted for at least 15 percent of all grocery sales — or a $400bn global market in 2014.[3] This implies that consumers face more and more the choice of purchasing a "responsible product" (or a product which is advertised as such) vis-à-vis a conventional alternative and that the vote with the wallet is a phenomenon of increasing relevance in contemporary markets.

Specific domains where the phenomenon is particularly relevant are those of socially responsible (SR) investment funds on the investor side and fair-trade products on the consumer side. According to the Eurosif European SRI Study (2014)[4], SR investment funds using exclusion criteria and therefore voting with their wallet in financial markets accounted for around 41 percent (€6.9 trillion) of European professionally managed assets in Europe in 2013, with a growth of around 91 percent between 2011 and 2013. Sustainable, responsible and impact investing has seemingly grown in the United States where the USSIF reports a 76 percent increase from $3.74 trillion at the start of 2012 to $6.57 trillion at the start of 2014 and a market share of around one sixth (Report on US Sustainable, Responsible and Impact Investing Trends 2014).

One of the most well-known and pioneering approaches to responsible consumption in the food and textile industry is Fair-trade. Fair-trade products originate from a product chain with specific socially and environmentally responsible characteristics (pre-financing of primary product producers, price stabilization, price premium reinvested in local public goods, investment for innovation in productive

[3] The Boston Consulting Group (2014), "When Social Responsibility Leads to Growth: An Imperative for Consumer Companies to Go Green", downloadable at http://us5.campaign-archive2.com/?u=a102a1f840f67f04e25a7fc97&id=b8f2d07db0.

[4] http://www.eurosif.org/our-work/research/sri/european-sri-study-2014/.

processes, etc.). What matters here for us is not whether fair-trade achieves what it promises[5] but that its popularity is growing and has created contagion and many imitations in terms of similar alternative product chains advertised as more socially and environmentally responsible to consumers. In times of stagnating consumption such as 2012, fair-trade sales registered a 33 percent yearly growth in Germany, 26 percent in the Netherlands, 28 percent in Sweden, 25 percent in Switzerland and 16 percent in the UK. The fair trade 'vote with the wallet' proposal is well known to UK consumers since the 2013-14 Fair-trade Annual Report documents that 31 percent shoppers seeked fair-trade products in 2013, while 77 percent know the fair-trade trademark.[6] The action of fair-trade not-for-profit pioneers triggered imitation of profit maximizing incumbents. Valuable examples are Nestlè,[7] Tesco, Sainsbury, Ben & Jerry (Unilever), [8] Starbucks, Mars[9] and Ferrero. [10]

SR investment funds using exclusion criteria and fair-trade are just two examples that the VWG is played by millions of consumers and investors everyday confirming the relevance of our investigation which aims to shed light on a topic which is far under-researched if compared to its growing economic importance.

3. The Vote-with-the-Wallet Game (VWG)

[5] For the literature on the economic impact of fair-trade see, among others, LeClair (2002), Becchetti et al. (2014), Maseland and de Vaal (2002), Moore (2004), Hayes (2004), and Redfern and Sneker (2002).

[6] Fair-trade Annual Impact Report 2013-14.

[7] http://news.mongabay.com/2005/1007-reuters.html

[8] http://www.mnn.com/earth-matters/wilderness-resources/blogs/ben-jerry-announces-big-move-into-fair-trade

[9] http://www.mars.com/global/press-center/press-list/news-releases.aspx?SiteId=94&Id=3182

[10] http://www.confectionerynews.com/Commodities/Ferrero-makes-Fairtrade-cocoa-commitment-after-rule-change

Following Becchetti and Salustri (2015), in the simplest two-player VWG player's utility conditional to the choice of voting for the responsible product (*vR*) or voting for the conventional product (*vC*) can be written as

$$U_i(S) = \begin{cases} \beta + \alpha - \gamma & if\ S = (vR, vR) \\ \frac{1}{2}\beta + \alpha - \gamma & if\ S = (vR, vC) \\ \frac{1}{2}\beta & if\ S = (vC, vR) \\ 0 & if\ S = (vC, vC) \end{cases}$$

were $S \coloneqq \left(S^i, S^{-i}\right) \in \{vC, vR\}^2$ indicates the strategy profile.

The parameter $\beta \in [0,+\infty)$ measures the externality arising from the voting choice that induces corporations to a more social, environmental and fiscally responsible stance, the intensity of the effect depending on the share of players choosing the (*vR*) strategy. The parameter $\alpha \in [0,+\infty)$ measures the positive effect generated by strategy (*vR*), in case of players' nonzero other-regarding preferences. The parameter $\gamma \in [0,+\infty)$ measures the cost differential between the *vR* strategy (buying the SR product) and the *vC* strategy (buying the equivalent non SR product). Players are assumed as being not income constrained in the game.[11]

As shown by Becchetti and Salustri (2015), with $G = (N, \left(S^i\right)_{i \in N}, (U_i)_{i \in N}$, $N = \{1,2\}$ and $S^i = \{vR, vC\}$, the unique NE of the game is (*vC*,*vC*) if $\frac{1}{2}\beta + \alpha < \gamma$ and (*vC*,*vC*) otherwise, and we are in the PD area for intermediate values of γ where $\frac{1}{2}\beta + \alpha < \gamma < \beta + \alpha$. In this parametric interval the unique NE - (*vC*,*vC*) - is Pareto dominated by the strategy pair (*vR*,*vR*).

In the multiplayer version of the game $n > 2$, $G_n = (N, \left(S^i\right)_{i \in N}, (U_i)_{i \in N})$, $N = \{1, \dots, n\}$, and $S^i = \{vR, vC\}$ for each $i \in N$. The payoff function now becomes

[11] Said in other terms this implies that only players without income constraints (income at least equal or above the full cost of the responsible product) can participate to the game.

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}\beta + \alpha - \gamma & \text{if } S^i = vR \\ \frac{j}{n}\beta & \text{if } S^i = vC \end{cases}$$

where j measures the number of players choosing the vR strategy in S^{-i}. The multiplayer game has (vC,vC) as a unique NE if $\frac{1}{n}\beta + \alpha < \gamma$ and (vR,vR) otherwise. What has to be noted is that a higher number of players clearly makes the PD region larger since the parametric interval of γ in which we are in presence of a PD is $\left(\frac{1}{n}\beta + \alpha, \alpha + \beta\right)$. This implies that, in global consumer and investor markets, the PD problem of the VWG is highly relevant.

4. The Experiment

4.1.Design

We experimentally investigate choice behavior in the VWG both with and without the redistribution mechanism. Our design is based on two finitely repeated versions of the game: in the base version a group of 10 players chooses repeatedly, independently and anonymously between two goods: A and B. In each round each player receives an endowment of 20 tokens and has to buy one of the following two goods: good A, which costs 10 tokens, or good B, which costs 5 tokens. Irrespectively of the good purchased, each player receives a benefit of 3 tokens for each player who buys good A (see Table 1). This characteristic of the game is intended to reproduce the positive externality generated by the purchase of the more expensive (responsible) good B. The above described payoff structure creates a free-riding problem since, for any given share of players choosing good A, buying good B is the dominant strategy (see Table 2).

Table 1 and 2 about here

An obvious advantage of the lab experiment setting is that we make players focus only on price and public good features of the problem while controlling for all other concurring factors (such as quality differentials) which in real life affect consumer choices among different types of products.

We consider also a second version of the VWG in which a redistributive mechanism is introduced. This 'redistribution' version differs from the basic one because at the end of each round 2.5 points are transferred from players who choose the good B to a common fund. Before the new round begins the fund is equally allocated among the payoffs of all the players who have chosen the good A. The payoffs of this second version of the game are described in Tables 3 and 4. In this game the redistributive mechanism renders more convenient to buy the good A.

Tables 3 and 4 about here

We consider also two additional variants of the base and redistribution games. In these two frames the goods are explicitly described as environmentally responsible goods. More specifically, they are identified as two 'electricity supply contracts' provided by two companies: a socially responsible company, selling good A, and a second unspecified company selling good B. Frame 1 describes social responsibility in terms of the company's commitment to the development of the local economy, while Frame 2 describes it in term of the company's funding social innovative projects on a larger, national scale. The two frames differ, in our intentions, for the different distances that they impose between the indirect potential benefits that the player may get from the company's socially responsible activities.[12]

In each treatment we consider the VWG in its base and redistribution versions; treatments differ because of the order in which the two versions are played (base followed by the redistribution

[12] For a specific description of the two frames see Appendix 1.

treatment or viceversa) and because of the frame used (*Base* without frames, *Base Frame 1* and *Base Frame 2*) (see Table 5).

Each player plays 10 rounds of the basic game and 10 rounds of the redistribution game and then completes a questionnaire. At the end of each round the number of cooperators is revealed to the group but their identity is kept anonymous.

Table 5 about here

By applying the theoretical framework described in section 3 to the parametric case of our game without redistribution we find that $n = 10$, $\frac{1}{10}\beta = 30, \gamma = 10$, and $\alpha = 0$ for simplicity. As a consequence the payoff function becomes[13]

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{10}30 - 10 & \text{if } S^i = vR \\ \frac{j}{10}30 & \text{if } S^i = vC \end{cases}$$

with *j* being the number of players choosing the *vR* strategy in S^{-i}. The multiplayer game has (*vC,vC*) as a unique (inefficient) NE since $\frac{1}{n}\beta + \alpha < \gamma < \beta + \alpha$ (i.e. $3 < 10 < 30$).

Note that we prefer to set α=0 in our payoff designs in order to make our game more directly comparable with standard contribution PD games (Arce and Sandler, 2005). In this way the existence of other regarding preferences becomes actually one of the interpretation for a nonzero share of co-operators in the game. By looking at Table 2 it is clear that only with $\alpha > 2$ players can find it optimal to vote with the wallet. As well, in the comparison between the basic and the framed version of the

[13] Players' endowment do not make any difference between the two choices and are omitted for simplicity.

game we implicitly check whether other regarding preferences of participants stimulated by the frame may modify the average share of contributors. In the game with redistribution the only difference is that, after their choices, players choosing the *vC* strategy will have to pay a lump sum tax of 3 points. The total amount collected from defectors (players choosing the *vC* strategy) will be redistributed in equal parts among players choosing the *vR* strategy. Note that ex post (post-redistribution) payoffs are such that choosing *vR* becomes the dominant strategy (see Table 4).

4.2. Hypotheses

From our design (see Table 5) several empirical static hypotheses can be inferred and tested by confronting subjects' behavior in the different treatments of the game. Let $C_{T(i,t)}$ be the strategy chosen by the *i*-th player in round *t* of game *G,* with $C \in \{vR,vC\}$ where *vR* (*voting for the responsible product*) is the purchase of good A, while *vC* (*voting for the conventional product*) is the purchase of good B, and $G \in \{$*Base, Base Frame 1, Base Frame 2, Redistribution, Redistribution Frame 1, Redistribution Frame 2*$\}$ indicates the version of the game.

More formally, by conveniently setting the choice *vR*=0 and the choice *vC*=1, we can test

Hypothesis 1: (no policy effect)

$$H_0: E[C_{i,t\,(Base)}] = E[C_{i,t\,(Redistribution)}]$$

$$H_A: E[C_{i,t\,(Base)}] \neq E[C_{i,t\,(Redistribution)}]$$

Under the null of hypothesis 1 the ex post redistribution mechanism does not affect the share of voting choices that are not significantly different in the *Base* and *Redistribution* treatments.

The two hypotheses that follow are closely related and test whether the ex post redistribution mechanism significantly affects voting choices when the treatments are framed (that is, when we explicitly describe in experiment instructions the more expensive product A as a socially responsible product).

Hypothesis 2: (no policy effect under frame 1)

H_0: $E[C_{i,t\,(Base\ Frame\ 1)}] = E[C_{i,t\,(Redistribution\ Frame\ 1)}]$

H_A: $E[C_{i,t\,(Base\ Frame\ 1)}] \neq E[C_{i,t\,(Redistribution\ Frame\ 1)}]$

Hypothesis 3: (no policy effect under frame 2)

H_0: $E[C_{i,t\,(Base\ Frame\ 2)}] = E[C_{i,t\,(Redistribution\ Frame\ 2)}]$

H_A: $E[C_{i,t\,(Base\ Frame\ 2)}] \neq E[C_{i,t\,(Redistribution\ Frame\ 2)}]$

Our fourth and fifth hypotheses test whether the two frames significantly affect *per se* voting choices vis-à-vis the *Base* treatment.

Hypothesis 4: (no frame 1 effect)

H_0: $E[C_{i,t\,(Base)}] = E[C_{i,t\,(Base\ Frame\ 1)}]$

H_A: $E[C_{i,t\,(Base)}] \neq E[C_{i,t\,(Base\ Frame\ 1)}]$

Hypothesis 5: (no frame 2 effect)

H_0: $E[C_{i,t\,(Base)}] = E[C_{i,t\,(Base\ Frame\ 2)}]$

H_A: $E[C_{i,t\,(Base)}] \neq E[C_{i,t\,(Base\ Frame\ 2)}]$

Last, our sixth and seventh hypotheses test whether the framed/non framed ex post redistribution mechanisms produce different shares of voters,

Hypothesis 6: (non differential base/frame 1 redistribution effect)

H_0: $E[C_{i,t\,(Redistribution)}] = E[C_{i,t\,(Redistribution\ Frame\ 1)}]$

H_A: $E[C_{i,t\,(Redistribution)}] \neq E[C_{i,t\,(Redistribution\ Frame\ 1)}]$

Hypothesis 7: (non differential base/frame 2 redistribution effect)

H_0: $E[C_{i,t\,(Redistribution)}] = E[C_{i,t\,(Redistribution\ Frame\ 2)}]$

H_0: $E[C_{i,t\,(Redistribution)}] \neq E[C_{i,t\,(Redistribution\ Frame\ 2)}]$

Note that, while hypotheses 1-3 test within effects, hypotheses 4-7 test between effects.

4.3. Experimental Procedures

We recruited 180 participants (90 females and 90 males) among the volunteers of the BERG (Behavioral Economics Research Group) of the University of Cagliari (Italy), mainly students, from a wide range of disciplines. The 18 experimental sessions took place in Cagliari in June 2015. Upon arrival in the lab, participants, ten per session, were randomly assigned, to a computer terminal. General instructions were read aloud and subjects were informed that the experiment consisted of two

phases, but they received only the specific instructions for phase one. Questions about the structure of the game, the procedures and the payment rules were then answered privately. Participants played the first ten rounds of the game. When everyone had completed phase one, subjects were given phase two instructions, which were read aloud. When the second phase ended all the participants completed a post-experimental questionnaire about their socio-demographic characteristics, general values and their attitude about corporate social and environmental responsibility (see Appendix 2).

One round among the twenty played by each participant was picked at random and paid privately in cash, in addition each participant received 5 tokens as show-up fee (conversion rate 2 tokens = 1 euro). The sessions lasted approximately one hour and earnings averaged about 16 euros. The experiment, other than for the experimental instructions, was computerized using the software z-Tree platform (Fischbacher, 2007).

5. Results on hypothesis testing

Results presented here refer to hypothesis testing described in section 4. We propose both aggregate and disaggregate tests (see Table 6 for a summary and Figures 1 and 2 for confidence intervals). More specifically, aggregate tests consider all rounds[14] and, as well, homogeneous treatments (*Base, Base Frame 1, Base Frame 2, Redistribution , Redistribution Frame 1, Redistribution Frame 2*) irrespective of their order, that is, irrespective of whether they are played in the first 10 rounds (as, for instance, the *Base* treatment in the *Base-Redistribution* design in sessions 1-3) or in the second 10 rounds (as, for instance, the *Base* treatment in the *Redistribution-Base* design in sessions 3-6). Disaggregate tests consider on the contrary sessions which are homogeneous both in terms of type of treatment and order (ie. the *Base-Redistribution* sequence in sessions 1-3 is considered separately from the *Redistribution-Base* sequence in sessions 4-6).

[14] We will analyze and comment the dynamic properties of our findings across rounds in section 6.1.

Table 6 and Figures 1 and 2 about here

When testing hypothesis 1 we find that the average share of voting with the wallet decisions is much smaller in the *Base* than in the *Redistribution* treatment (25.6 percent against 59.3 percent, Table 6). This implies three main considerations. First, we find a significant share of cooperative choices (around one fourth) even in absence of the redistribution mechanism. Second, the redistribution treatment adds around one third of cooperative choices out of total choices. Third, a significant share of non cooperative choices (around 40 percent) remains also in the *Redistribution* treatment. The null of hypothesis 1 assuming that the redistribution mechanism has no significant effect is therefore strongly rejected by experimental evidence (χ^2 139.14, p-value 0.000).

The irrelevance of the ex post redistribution mechanism is rejected as well under the two framed designs (hypotheses 2 and 3, with respectively χ^2 71.40, p-value 0.000 and χ^2 48.70, p-value 0.000). Note however that the share of cooperative choices under *Base Frame 1* and *Base Frame2* treatments is higher than under the *Base* treatment (around 41 and 46 percent players choosing the responsible product respectively). As well, the gain in terms of cooperative choices after the introduction of the redistribution mechanism is relatively lower with respect to what happens under the *Base* treatment (14 and 20 percent respectively in *Redistribution Frame 1* and *Redistribution Frame 2*). Given what said above is no wonder that hypotheses 4 and 5 are rejected since the *Base Frame 1* and *Base Frame 2* treatments produce a significantly higher share of purchases of the responsible product than the Base treatment (χ^2 33.05, p-value 0.000 and χ^2 53.94, p-value 0.000 respectively). Our findings on hypotheses 6 and 7 show that the latter are not rejected documenting that there is no significant difference in the impact of the frame on the share of responsible players in the treatments with redistribution, that is, when the redistribution treatment varies from the *Redistribution* to the *Redistribution Frame 1* and *Redistribution Frame 2* treatments.

In order to increase homogeneity of the aggregated round treatments we decompose our previous tests by separately considering the (framed and not framed) base/redistribution and the (framed and not framed) redistribution/base sequences. The hypothesis of no difference in the share of cooperative choices between the base and the redistribution treatments is strongly rejected as well when we look at homogeneous sequences separating cases in which redistribution comes first (after) and base treatment comes after (first). The only exception is the *Base Frame 1-Redistribution Frame 1* sequence (Table 6 from line 8 on).

5.1 Dynamic findings

In what discussed above we did not investigate how players' behavior evolve across rounds. We do it here, firstly, by plotting the share of players choosing the responsible product for each of the 20 rounds in homogeneous sessions.

Figures 3 and 4 about here

We start with the first three sessions where players play the *Base* treatment for the first 10 rounds and the *Redistribution* treatment for the following 10 rounds (Figure 3). Four main results emerge. First, the break in the share of the responsible choices following the introduction of the redistribution mechanism is sharp (from 17.7 in the last (10^{th}) round without redistribution to 77.7 percent in the 11^{th} round when the redistribution mechanism is first applied). Second, the negative slope of the share of responsible players in the 10 rounds of the *Base* treatment documents a decay of cooperative choices showing that players tend to move toward the Nash Equilibrium of zero cooperators in absence of the redistribution mechanism. More specifically, we start from a share of 63.3 percent of cooperators in the first round and fall down to 17.7 percent in the 10^{th} round. In absence of further

round we cannot however say whether the zero cooperators share will be achieved or if a share of unconditional cooperators will persist. Third, the same downward movement after the redistribution break is not observed in the following 10 rounds since the difference between the 11th and the 20th round is smaller and not significant in terms of 95% confidence intervals. Fourth, the share of responsible voters is in general below the 100% share of the new (redistribution design) Nash equilibrium since the latter ranges from a maximum of 76.6 percent to a minimum of 46.6 percent (ending up with a share of 60 percent in the 20th round).

In treatments 4 to 6 we invert the Base-Redistribution sequence (the first 10 rounds with redistribution are followed by 10 rounds with no redistribution) and find that the break after the 10th round is less strong than in treatments 1-3, even though still remarkable (the share of cooperators falls from 63.3 to 30 percent from the 10th to the 11th round). The downward slope in the first ten rounds of the base treatment is still relevant (from 30 to 6.6 percent cooperators from the 11th to the 20th round). The share of players buying the responsible product ranges between 46.6 and 80 percent in the first ten redistribution rounds and is in any case below the redistribution design Nash equilibrium.

Results from the other groups of homogeneous designs in which we apply the two frames display similar properties. In the *Base Frame 1* - *Redistribution Frame 1* design the downward slope in the first 10 rounds is step. We start from 90 percent responsible voters in the first round and end up to 33.3 percent in the 10th round. The break of the 11th round in which we begin to introduce the redistribution mechanism brings back the cooperators' share to 70 percent. The share remains quite stable going to a minimum of 57.46 percent and ends up to 60 percent in the last round, well below the Nash equilibrium in presence of the redistribution mechanism. When we invert the sequence between the *Base Frame 1* and the *Redistribution Frame 1* treatment results are less clear-cut. The main difference here is that the break between the 10th and the 11th round is much smaller (from 57.6 to 47.6 percent cooperative choices) and the slope is negative as well in the first 10 periods of the redistribution mechanism (from 83.3 to 56.6 percent cooperative choices).

When looking at the first sequence of the second frame (*Frame 2 – Redistribution Frame 2*) treatment we find again that the latter has a very strong initial effect also in absence of the redistribution mechanism. In the first round 86.6 percent of players buy the responsible product. However the share of cooperators declines across rounds down to 46.6 percent in the last (10^{th}) round without redistribution mechanism. The 11^{th} round break after the introduction of the redistribution mechanism is remarkable and brings the share of responsible voters up to 73.3 percent. The final share of cooperators in the 20^{th} round is not much lower (63.3 percent) but still below the redistribution design Nash equilibrium.

In the last group of homogeneous sessions (where we switch from the *Redistribution Frame 2* to *Base Frame 2* treatment) we find that the share of responsible voters is very high at the beginning (86.6 percent) moving down to 70 percent at period 10 (figure 4). The break is not remarkable since 56.6 percent of players choose the responsible product at the 11^{th} round when the redistribution mechanism is eliminated and the final share of responsible voters is down to 23.3 percent in the last round.

5.2 Regression findings

Econometric estimates may help us to shed further light on the determinants of our findings. In a perfect information vote-with-the-wallet theoretical model we know that two of the three parameters are fixed and common to each player (the extra cost of voting for the responsible product γ and the public good benefit β). Our experiment faithfully reproduces these two characteristics. However there is a third parameter (the self-regarding preference component), which is unknown and likely to be heterogeneous among players. This parameter accounts for differences in players' choices and in our *Base* treatment it must worth more than 2 tokens to produce a switch from the conventional to the responsible product given the payoff structure shown in Table 2.

By regressing players' choices on a set of socio-demographic variables we may understand which factors affect the above mentioned other regarding preference parameter.

We start with the following pooled data specification

$$ResponsibleChoice_{i,t,s} = \beta_0 + \beta_1 Redistribution_{t,s} + \beta_2 \text{Frame } 1_{t,s} + \beta_3 \text{Frame } 2_{t,s} + \beta_4 Round + \beta_5 Round * Redistribution + \sum \delta_i SocioDem_i \quad (1)$$

where *ResponsibleChoice* is a dummy taking value 1 if the *i*-th individual purchases the good A (the buying responsible choice) and 0 otherwise in session *s* at round *t. Redistribution* is a (0/1) dummy equal to 1 if the redistribution mechanism is applied in session *s* at round *t*, *Frame 1 (Frame 2) is* a (0/1) dummy equal to 1 if *Base Frame 1* (*Base Frame 2*) treatment applies. The variable *Round* measures the round number thereby controlling for the time effect within the treatment. We also control for the interaction using the variable *Round*Redistribution* (dummy *Redistribution* times the *Round* variable) to test whether the round effect changes when the redistribution mechanism is applied. *SocioDem* represents the socio-demographic variables added as controls in the estimates[15] (age, sex, housing conditions, mother education, father education, mother professional status, father professional status, volunteering activities).

Regression findings in Table 7 (column 1) document that the *Frame 1* dummy produces a significant and positive effect (0.763) on the probability of buying the responsible product vis-à-vis the Base treatment that represents the omitted benchmark. The impact of the *Frame 2* dummy is as well

[15] For further details on the socio-demographic variables and their impact see questions 1-11 of the Questionnaire in Appendix 2 and detailed descriptive and econometric findings in Appendix 3.

positive and significant and stronger in magnitude (1.018). The policy redistribution effect is as well positive and significant (0.990). These results confirm findings of our static tests on hypotheses 1-5 and are consistent with what observed in Figure 3 and 4.

Another relevant result is the negative and significant effect of the *Round* variable (-0.097) confirming that the repeated game tends to bring players toward the non cooperative Nash equilibrium as shown by Figure 3. However our descriptive findings documented as well that this effect occurred mainly in no redistribution rounds, while being almost absent when the redistribution mechanism is at work. This evidence is as well confirmed and supported by the positive and significant effect (0.076) of the interacted *Round*Redistribution* dummy variable. The combination of the two results documents that the introduction of the redistribution mechanism interrupts the 'entropic' effect bringing players away from cooperation.

With regard to the other controls our findings show that practice of voluntary activities, the number of family members and left wing political orientation are positively and significantly correlated with the responsible voting choice.

In order to investigate more in depth the role of time in our repeated experiment we propose the following dynamic estimate in which we test for the existence of conditional cooperation and/or conformity.

$$ResponsibleChoice_{i,t,s} = \beta_0 + \beta_1 Redistribution_{t,s} + \beta_2 \text{Frame } 1_{t,s} + \beta_3 \text{Frame } 2_{t,s} + \beta_4 Round + \beta_5 Round * Redistribution + \beta_6 AvgGroupResponsibleChoice_{i,t-1,s} + \beta_7 [PlayerChoice_{i,t-1,s} - AvgResponsibleChoice_{t-1,s}] + \sum \delta_i SocioDem_i \quad (2)$$

More specifically, the introduction of time in our estimates allows us to add two variables. The first - $AvgResponsibleChoice_{i,t-1,s}$ - is the lagged average share of responsible voters. The second - $[PlayerChoice_{i,t-1,s} - AvgGroupResponsibleChoice_{t-1,s}]$ - is the lagged difference between the

player's choice and the average choice of players in her/his session (where the choice equal 1 when buying responsibly and 0 otherwise). The first variable is positive and significant indicating the presence of conditional cooperation and/or conformity.[16] The second variable is as well positive and significant rejecting the hypothesis of an error correction mechanism and documenting instead a reinforcement mechanism where players who deviate from average behavior in sense of non cooperation reinforce their attitude in the following round.

6. Conclusions

More and more, millions of consumers and investors face everyday the alternative between buying/ investing in a product which they consider as more socially and environmentally responsible and an alternative conventional product. Most of times this choice is accompanied by a trade-off between social responsibility and prices. We reproduce the essential features of the dilemma in a model and test empirically the behavior of players facing the dilemma in a randomized experiment looking more specifically at the effect of frames and ex post redistribution mechanisms between cooperators and defectors.

Our experimental results highlight three main findings. First, conditional cooperation brings toward the Nash equilibrium (even though not reaching it) in the no redistribution treatment and progressively reduces the number of voters across time in an 'entropic' effect where the 'energy' of cooperation progressively fades over time. Second, frame effects matter, producing a share of voters significantly higher in no redistribution treatments. This last finding contributes to explain why

[16] In order to discriminate between conditional cooperation (see among others Fischbacher, Gachter, and Fehr, 2001) and Fischbacher and Gächter, 2010) and conformity (see among others Moscovici, 1985 and Cialdini and Trost, 1998) we should have introduced an additional treatment where players are informed about the average share of cooperators in sessions different from their one. The issue however is beyond the scope of our analysis and left for future research.

advertising on corporate social responsibility is so popular today. Third, redistribution mechanisms work, especially when combined with base treatments with sustainability frames. However they produce a level of cooperation inferior to that predicted by the post-redistribution Nash equilibrium.

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Tables and Figures

Table 1: Costs and benefits in the Base Vote-with-the-wallet game (VWG) experiment

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A

Table 2: Players' payoff in the Base VWG experiment conditional to other players' choices.

	When you buy good A				**When you buy good B**			
How many players choose good A	Endowment	Cost	Benefit	**TOTAL**	Endowment	Cost	Benefit	**TOTAL**
			3 X *n* =				3 X *n* =	
10	20	-10	30	**40**	-	-	-	-
9	20	-10	27	**37**	20	-5	27	**42**
8	20	-10	24	**34**	20	-5	24	**39**
7	20	-10	21	**31**	20	-5	21	**36**
6	20	-10	18	**28**	20	-5	18	**33**
5	20	-10	15	**25**	20	-5	15	**30**
4	20	-10	12	**22**	20	-5	12	**27**
3	20	-10	9	**19**	20	-5	9	**24**
2	20	-10	6	**16**	20	-5	6	**21**
1	20	-10	3	**13**	20	-5	3	**18**
0	-	-	-	-	20	-5	0	**15**

Table 3: Costs and benefits in the VWG experiment with Redistribution

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A
Redistribution effect	2.5 tokens times the number of players who choses product B, divided by the number of those who choses product A	-2.5

Table 4: Players' payoff in the VWG experiment with Redistribution, conditional to other players' choices.

	When you buy good A					**When you buy good B**				
How many players choose good A	Endowment	Cost	Benefit	Redistribution	**TOTAL**	Endowment	Cost	Benefit	Redistribution	**TOTAL**
			3 X *n* =					3 X *n* =		
10	20	-10	30	-	**40.0**	-	-	-		-
9	20	-10	27	0.3	**37.3**	20	-5	27	-2.5	**39.5**
8	20	-10	24	0.6	**34.6**	20	-5	24	-2.5	**36.5**
7	20	-10	21	1.1	**32.1**	20	-5	21	-2.5	**33.5**
6	20	-10	18	1.7	**29.7**	20	-5	18	-2.5	**30.5**
5	20	-10	15	2.5	**27.5**	20	-5	15	-2.5	**27.5**
4	20	-10	12	3.8	**25.8**	20	-5	12	-2.5	**24.5**
3	20	-10	9	5.8	**24.8**	20	-5	9	-2.5	**21.5**
2	20	-10	6	10.0	**26.0**	20	-5	6	-2.5	**18.5**
1	20	-10	3	22.5	**35.5**	20	-5	3	-2.5	**15.5**
0	-	-	-	-	-	20	-5	0	-2.5	**12.5**

Table 5: Treatments and Sessions.

Treatment	Phase 1 (10 rounds)	Phase 2 (10 rounds)	Phase 3	Subjects no.
BR	Base	Redistribution	Questionnaire	30
RB	Redistribution	Base	Questionnaire	30
BR1	Base Frame 1	Redistribution Frame 1	Questionnaire	30
RB1	Redistribution Frame 1	Base Frame 1	Questionnaire	30
BR2	Base Frame 2	Redistribution Frame 2	Questionnaire	30
RB2	Redistribution Frame 2	Base Frame 2	Questionnaire	30

Table 6. Hypothesis testing

Treatment (1) vs (2)	Obs.	Share of cooperators (%) (1) vs (2)	χ^2	P- value
Base vs Redistribution (aggregate)	1,200	25.6 vs 59.3	139.144	0.000
Base Frame 1 vs Redistribution Frame 1 (aggregate)	1,200	41.3 vs 65.6	71.403	0.000
Base Frame2 vs Redistribution Frame2 (aggregate)	1,200	46.0 vs 66.0	48.701	0.000
Base vs Base Frame 1	1,200	25.6 vs 41.3	33.053	0.000
Base vs Base Frame 2	1,200	25.6 vs 46.0	53.944	0.000
Redistribution vs Redistribution Frame 1	1,200	59.3 vs 65.6	5.134	0.023
Redistribution vs Redistribution Frame 2	1,200	59.3 vs 66.0	5.699	0.017
Base vs Redistribution	600	27.6 vs 58.3	57.555	0.000
Redistribution vs Base	600	60.3 vs 23.6	82.786	0.000
Base Frame 1 vs Redistribution Frame 1	600	48.3 vs 64.3	15.611	0.000
Redistribution Frame 1 vs Base Frame 1	600	67.0 vs 34.3	64.038	0.000
Base Frame 2 vs Redistribution Frame 2	600	62.0 vs 67.6	2.113	0.146
Redistribution Frame 2 vs Base Frame 2	600	64.3 vs 30.0	70.955	0.000

Legend: aggregate includes both sequences of the two treatments in alternating order, i.e. Base vs Redistribution and Redistribution vs Base concerning the first row, Base Frame 1 vs Redistribution Frame 1 and Redistribution Frame 1 vs Base Frame 1 concerning the second row, Base Frame 2 vs Redistribution Frame 2 and Redistribution Frame 2 vs Base Frame 2 concerning the third row.

Table 7. Econometric findings

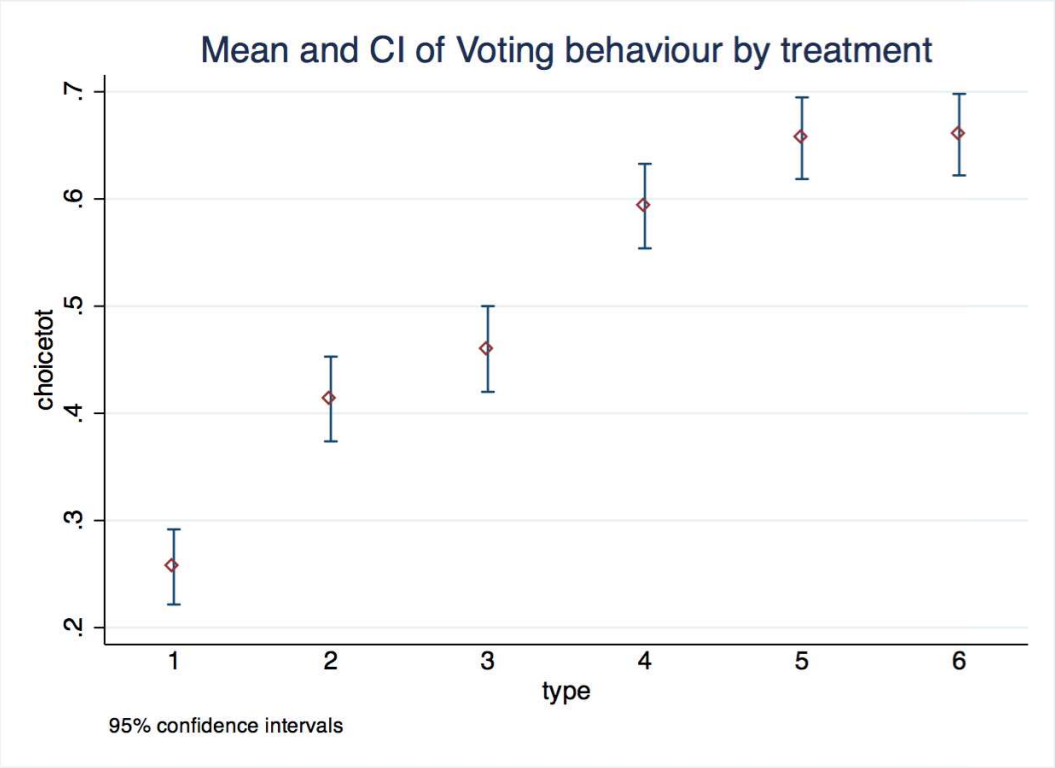
VARIABLES	(1) STAT	(2) DYN	(2) DYN
Redistribution	0.990***	1.140***	1.053***
	(0.181)	(0.297)	(0.309)
Redistribution Frame 1	0.763***	0.631***	0.583***
	(0.142)	(0.197)	(0.199)
Redistribution Frame 2	1.018***	0.833***	0.740***
	(0.141)	(0.202)	(0.215)
Round	-0.0974***	-0.0767***	-0.0794***
	(0.00968)	(0.0160)	(0.0164)
Round*Redistribution	0.0758***	0.0659***	0.0707***
	(0.0136)	(0.0248)	(0.0256)
$AvgResponsibleChoice_{t-1}$		0.572**	0.525**
		(0.260)	(0.261)
$ResponsibleChoice_{t-1}$ - $AvgResponsibleChoice_{t-1}$		0.885***	0.896***
		(0.105)	(0.105)
Socio-Demographic controls	Yes	Yes	No
Fixed effects	No	No	Yes
Observations	3,600	3,420	3,420
Number of id		180	180

Standard errors in parentheses

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

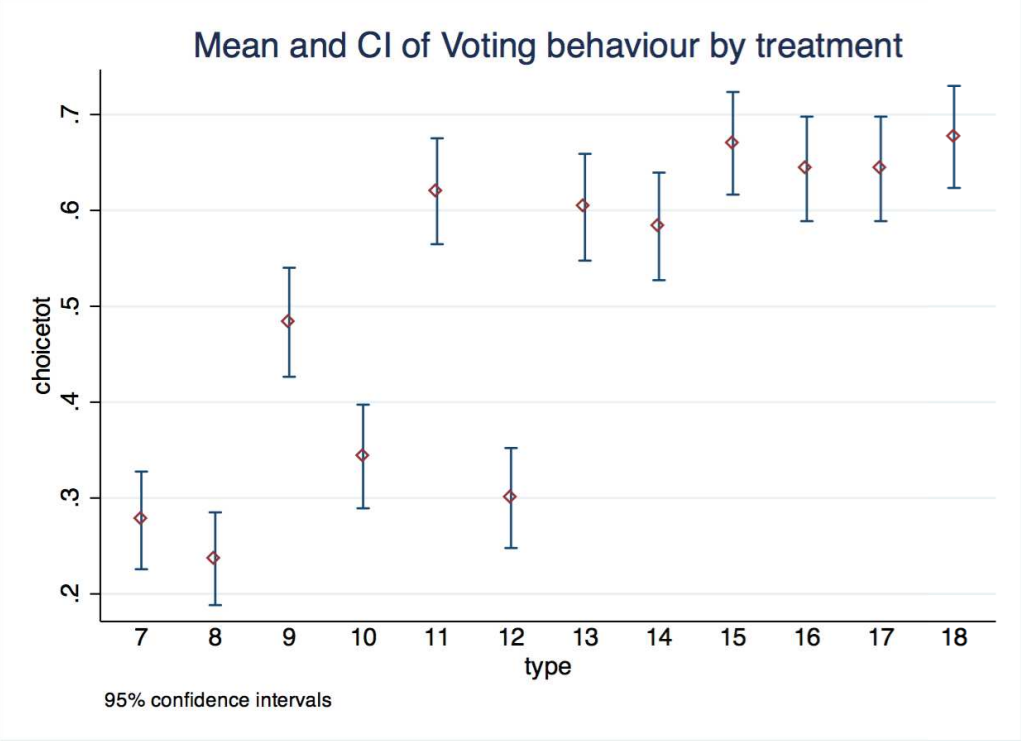
Legend: STAT: pooled estimate of specification (1); DYN: panel data estimate of specification (2) augmented with two dynamic variables (see section 6.2 for the definition of regressors).

Figure 1:Voting Behavior by Treatment



Legend (vertical axis: share of players buying the responsible product, horizontal axis numbers and corresponding treatments): (1) Base, (2) Base Frame 1, (3) Base Frame 2, (4) Redistribution, (5) Redistribution Frame 1, (6) Redistribution Frame 2.

Figure 2:Voting Behavior by Treatment (disaggregated by order)



Legend(vertical axis: share of players buying the responsible product, horizontal axis numbers and corresponding treatments): (7) Base (in Base-Redistribution sessions), (8) Base (in Redistribution-Base sessions), (9) Frame 1 in Base Frame 1- Redistribution Frame 1 sessions, (10) Base Frame 1 in Redistribution Frame 1 - Base Frame 1 sessions, (11) Frame 2 in Base Frame 2- Redistribution Frame 2 sessions, (12) Base Frame 2 in Redistribution Frame 2 - Base Frame 2 sessions, (13) (Redistribution) (in Base-Redistribution sessions), (14) Redistribution (in Redistribution-Base sessions) (15) Redistribution Frame 1 in Base Frame 1- Redistribution Frame 1 sessions, (16) Redistribution Frame 1 in Redistribution Frame 1 - Base Frame 1 sessions, (17) Redistribution Frame 2 in Base Frame 2- Redistribution Frame 2 sessions, (18) Redistribution Frame 2 in Redistribution Frame 2 - Base Frame 2 sessions.)

Figure 3. Share of players buying the responsible product (by treatment)

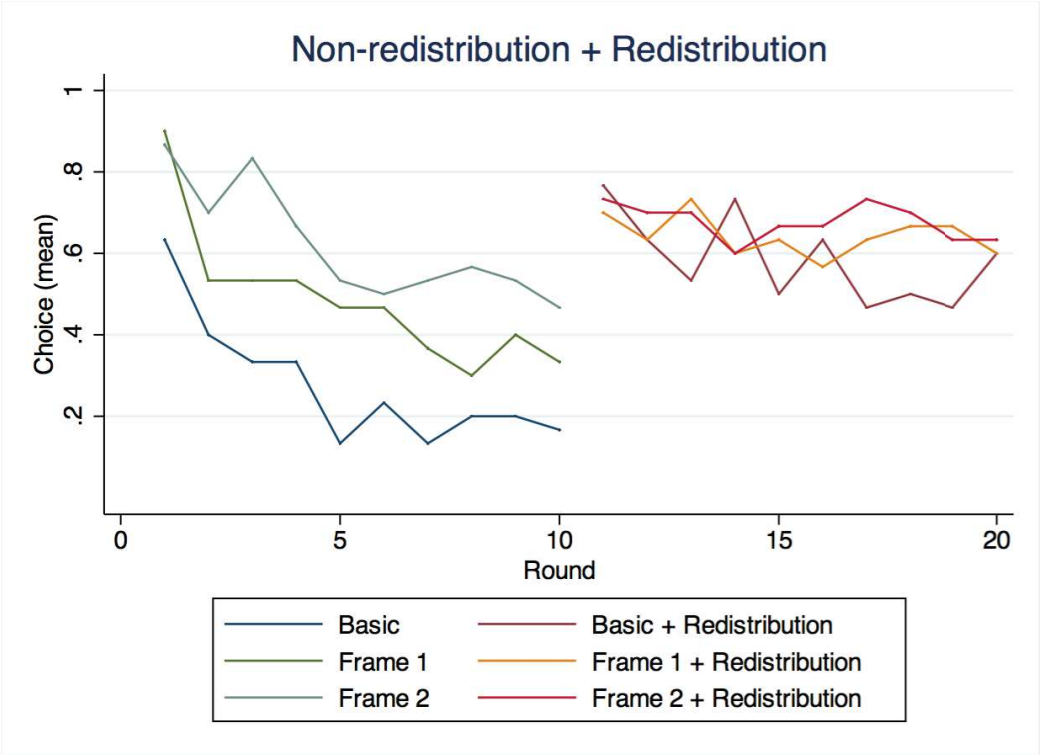


Figure 4. Share of players buying the responsible product (by treatment)



Appendix 1: Experimental instructions

1. General instructions

Welcome and thanks for participating to this experiment. Our goal is to verify the impact of some factors on our decision processes. Together with other participants you will have to take decisions in different situations. Depending of your decisions along with those of the other participants you will get a certain number of points. One among all your decision will be picked randomly and the points you get in that particular situation will be converted in euros (with the exchange rate 2 points = 1 euro) and paid to you in cash. Besides, you will receive 5 points for participating. These points will sum up to those gained during the experiment.

Your identity and those of the other participants to the experiment will never be revealed even after the end of the experiment. Also your choices and answers will be dealt with anonymously (without reference to your identity). Overall the experimental session will last approximately one hour. We ask you to work alone and in silence.

Thanks for your participation!

2. Specific instructions

2.1 Base Treatment

In this session you will be asked to choose (for 10 rounds) which, among two products (product A and product B), you intend to buy. For every round you will be given an endowment of 20 points that you will be able to spend to purchase one of the two products. At each round, after your choice and the choices of all other players, we will tell to you and them, without revealing their identity, how many players have chosen product A and product B. After this communication you will play the following round.

Round *n*

You receive an endowment of 20 points. You must choose whether to buy:

- Product A
- Product B.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B costs 5 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows:

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table:

	When you buy good A				**When you buy good B**			
How many players choose good A	Endowment	Cost	Benefit	**TOTAL**	Endowment	Cost	Benefit	**TOTAL**
			3 X *n* =				3 X *n* =	
10	20	-10	30	**40**	-	-	-	-
9	20	-10	27	**37**	20	-5	27	**42**
8	20	-10	24	**34**	20	-5	24	**39**
7	20	-10	21	**31**	20	-5	21	**36**
6	20	-10	18	**28**	20	-5	18	**33**
5	20	-10	15	**25**	20	-5	15	**30**
4	20	-10	12	**22**	20	-5	12	**27**
3	20	-10	9	**19**	20	-5	9	**24**
2	20	-10	6	**16**	20	-5	6	**21**
1	20	-10	3	**13**	20	-5	3	**18**
0	-	-	-	-	20	-5	0	**15**

Please choose: Product A Product B

2.2 Redistribution treatment

Same as in the Base treatment plus:

Notice that, at the end of each round 2.5 points will be subtracted from the payoff of all those participants who have chosen **product B.** All those point will for a common fund that will equally divided among the participants who have chosen **product A.**

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A
Redistribution effect	2.5 times the number of players who choses product B, divided by the number of those who choses product A	-2.5

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table:

	When you buy good A					When you buy good B				
How many players choose good A	Endowment	Cost	Benefit	Redistribution	**TOTAL**	Endowment	Cost	Benefit	Redistribution	**TOTAL**
			3 X *n* =					3 X *n* =		
10	20	-10	30	-	**40.0**	-	-	-		-
9	20	-10	27	0.3	**37.3**	20	-5	27	-2.5	**39.5**
8	20	-10	24	0.6	**34.6**	20	-5	24	-2.5	**36.5**
7	20	-10	21	1.1	**32.1**	20	-5	21	-2.5	**33.5**
6	20	-10	18	1.7	**29.7**	20	-5	18	-2.5	**30.5**
5	20	-10	15	2.5	**27.5**	20	-5	15	-2.5	**27.5**
4	20	-10	12	3.8	**25.8**	20	-5	12	-2.5	**24.5**
3	20	-10	9	5.8	**24.8**	20	-5	9	-2.5	**21.5**
2	20	-10	6	10.0	**26.0**	20	-5	6	-2.5	**18.5**
1	20	-10	3	22.5	**35.5**	20	-5	3	-2.5	**15.5**
0	-	-	-	-	-	20	-5	0	-2.5	**12.5**

3. Frames

The frames concern a more detailed description of the two products

3.1 Frame 1

Product A is a 'energy supply contract'. The company that provides it is committed to:

- spend the 80% of its budget within the region, to generate a positive impact on the local economy, both in term of value creation and higher employment;
- employ workers only with permanent employment contract;
- train on a regular basis the employees to keep their capabilities and human capital constantly up-to-date.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B is a 'energy supply contract' provided by a company that does not implement any particular form of social responsible conduct. **Product B** costs 5 points. If you choose product B you will you will receive 3 points for any of the other players choosing to buy product A.

3.2 Frame 2

Product A is a ‘energy supply contract’. The company that provides it, is committed to devote each year a share of its profits to fund a number of high social impact projects. A national call will attract socially oriented projects that will be selected through a voting process among the company clients.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B is a ‘energy supply contract’ provided by a company that does not implement any particular form of social responsible conduct. **Product B** costs 5 points. If you choose product B you will you will receive 3 points for any of the other players choosing to buy product A.

Appendix 2: Post-Experimental Questionnaire

1. Gender
2. Age
3. Place of residence
4. Housing condition:
    a. Living alone
    b. Living with family
    c. Living with other people (non family)
5. Father education
    a. Primary School
    b. Middle School
    c. Upper Intermediate/High school
    d. University degree
    e. Other
6. Mother education
    a. Primary School
    b. Middle School
    c. Upper Intermediate/High school
    d. University degree
    e. Other
7. Father professional status
    a. Self employed
    b. Clerk
    c. Manual worker
    d. Executive
    e. Retired

f. House activity

g. Student

h. Entrepreneur

i. Unemployed

j. Other

8. Mother professional status

a. Self employed

b. Clerk

c. Manual worker

d. Executive

e. Retired

f. House activity

g. Student

h. Entrepreneur

i. Unemployed

j. Other

9. Number of people in the household (including yourself)

10. Are you or members of your family actively involved in volunteering organisations?

11. Are you or members of your family actively involved in environmental organisations?

12. Whom do you buy your electricity from?

13. Does you house/apartment is provided with any of the following technologies?

a. Solar panels

b. Other solar thermal technologies

c. Pellet stoves

14. Your family's yearly net income (year 2014):

a. < 15.000

b. 15.001 - 25.000

c. 25.001 - 35.000

d. 35.001 - 50.000

e. 50.001 - 90.000

f. > 90.000

Use this scale to answer the following questions

Not at all=0 Completely satisfied=10

15. How much do you feel satisfied about what you experienced during this experiment?
16. How much do you feel satisfied about others' participant behavior in the games?
17. How much do you feel satisfied about your behavior in the game?
18. Generally speaking how much do you think you can trust others
19. To what extent are you satisfied with your life in general?
20. To what extent are you satisfied with your life in financial situation?
21. Using a scale (-5 = left , 0 center, +5 right) how would you define your political preferences?

Appendix 3: Additional online material

Table A1. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Male	3600	.5	.5000695	0	1
LivingAlone	3600	.0611111	.2395673	0	1
LivingInFamily	3600	.6388889	.4803894	0	1
LivingWithOthers	3600	.3	.4583212	0	1
FatherElementarySchool	3600	.0722222	.2588915	0	1
FatherIntermediateSchool	3600	.4	.489966	0	1
FatherHighSchool	3600	.3388889	.4733978	0	1
FatherGraduate	3600	.1888889	.3914747	0	1
MotherElementarySchool	3600	.0611111	.2395673	0	1
MotherIntermediateSchool					
MotherHighSchool	3600	.4833333	.4997916	0	1
MotherGraduate	3600	.1166667	.3210673	0	1
Income Low	3600	.3	.4583212	0	1
Income MediumLow	3600	.2222222	.4157975	0	1
Income Medium	3600	.25	.4330729	0	1
Income MediumHigh	3600	.1333333	.3399819	0	1
Income High	3600	.0944444	.2924867	0	1
FatherSelfEmployed	3600	.1555556	.3624838	0	1
FatherClerk	3600	.1555556	.3624838	0	1
FatherManualWorker	3600	.1111111	.3143133	0	1
FatherExecutive	3600	.0277778	.1643584	0	1
FatherRetired	3600	.3166667	.4652408	0	1
FatherHouseActivity	3600	0	0	0	0
FatherStudent	3600	0	0	0	0
FatherEntrepreneur	3600	.0833333	.2764238	0	1

FatherEmployer	3600	.0722222	.2588915	0	1
MotherSelfEmployed	3600	.05	.2179752	0	1
MotherClerk	3600	.2222222	.4157975	0	1
MotherManualWorker	3600	.0388889	.193357	0	1
MotherExecutive					
MotherRetired	3600	.1055556	.3073106	0	1
MotherHouseActivity	3600	.4277778	.4948252	0	1
MotherStudent	3600	0	0	0	0
MotherEntrepreneur	3600	.0388889	.193357	0	1
MotherEmployer	3600	.0277778	.1643584	0	1
Voluntary	3600	.3944444	.4887989	0	1
AssociationMembership	3600	.0777778	.2678588	0	1
NumberOfFamilyMembers	3600	3.994.444	1.062.102	1	8

VARIABLES	(1) STAT choicetot	(2) DYN choicetot	(3) DYN1 choicetot
Redistribution	0.990***	1.140***	1.053***
	(0.181)	(0.297)	(0.309)
Frame 1	0.763***	0.631***	0.583***
	(0.142)	(0.197)	(0.199)
Frame 2	1.018***	0.833***	0.740***
	(0.141)	(0.202)	(0.215)
Round	-0.0974***	-0.0767***	-0.0794***
	(0.00968)	(0.0160)	(0.0164)
Round*Redistribution	0.0758***	0.0659***	0.0707***
	(0.0136)	(0.0248)	(0.0256)
$AvgResponsibleChoice_{t-1}$		0.572**	0.525**
		(0.260)	(0.261)
$ResponsibleChoice_{t-1}$ - $AvgResponsibleChoice_{t-1}$		0.885***	0.896***
		(0.105)	(0.105)
Male	-0.101	-0.125	
	(0.0798)	(0.185)	
Age	0.0678***	0.0825**	
	(0.0143)	(0.0335)	
LivingWithFamily		-0.278	
		(0.447)	
LivingWithOthers		-0.358	
		(0.442)	
FatherIntermediateSchool		-0.183	
		(0.436)	
FatherHighSchool		0.0741	
		(0.427)	
FatherGraduate		0.0447	
		(0.474)	
MotherIntermediateSchool		-0.216	
		(0.427)	
MotherHighSchool		-0.470	
		(0.435)	
MotherGraduate		-0.713	
		(0.536)	
MotherOtherEdu		-1.168	
		(0.902)	
FatherClerk		-0.0436	
		(0.341)	
FatherManualWorker		-0.637*	
		(0.382)	
FatherExecutive		0.347	
		(0.668)	
FatherRetired		-0.201	
		(0.323)	
FatherEntrepreneur		0.337	
		(0.415)	

FatherUnemployed		0.0253
		(0.438)
FatherEmployer		-0.176
		(0.407)
MotherClerk		-0.954**
		(0.460)
MotherManualWorker		-1.124*
		(0.660)
MotherExecutive		-0.266
		(0.866)
MotherRetired		-1.604***
		(0.518)
MotherHouseActivity		-0.953**
		(0.464)
MotherStudent		-0.676
		(0.659)
MotherEntrepreneur		-1.030
		(0.744)
MotherEmployer		-0.496
		(0.536)
Income MediumLow		0.606**
		(0.277)
Income Medium		0.121
		(0.280)
Income MediumHigh		0.0449
		(0.334)
Income High		0.116
		(0.413)
NumberOfFamilyMembers	0.0999**	0.110
	(0.0400)	(0.0934)
Voluntary	0.236***	0.283
	(0.0825)	(0.192)
AssociationMembership	0.304*	0.316
	(0.157)	(0.360)
Politics	-0.162***	-0.145*
	(0.0374)	(0.0856)
LivingWithFamily	-0.149	
	(0.189)	
LivingWithOthers	-0.180	
	(0.188)	
FatherIntermediateSchool	-0.188	
	(0.189)	
FatherHighSchool	-0.0197	
	(0.187)	
FatherGraduate	0.00271	
	(0.205)	
MotherIntermediateSchool	-0.130	
	(0.185)	
MotherIntermediateSchool	-0.347*	
	(0.189)	
MotherGraduated	-0.498**	

	(0.233)		
MotherOtherEdu	-1.237***		
	(0.389)		
FatherClerk	-0.0808		
	(0.147)		
FatherManualWorker	-0.609***		
	(0.166)		
FatherExecutive	0.313		
	(0.280)		
FatherRetired	-0.145		
	(0.141)		
FatherEntrepreneur	0.235		
	(0.175)		
FatherUnemployed	0.0394		
	(0.190)		
FatherEmployer	-0.224		
	(0.179)		
MotherClerk	-0.839***		
	(0.202)		
MotherManualWorker	-0.829***		
	(0.287)		
MotherExecutive	-0.143		
	(0.371)		
MotherRetired	-1.394***		
	(0.225)		
MotherHouseActivity	-0.804***		
	(0.203)		
MotherStudent	-0.586**		
	(0.285)		
MotherEntrepreneur	-0.864***		
	(0.315)		
MotherEmployer	-0.390*		
	(0.235)		
Income MediumLow	0.610***		
	(0.120)		
Income Medium	0.124		
	(0.120)		
Income MediumHigh	0.0740		
	(0.144)		
Income High	0.123		
	(0.177)		
id			0.00238
			(0.00199)
Observations	3,600	3,420	3,420
Number of id		180	180

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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