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## **Adding Environmental Protection To Exchange: More Harm Than Good?**

Very preliminary version

**Abstract:** Cause related products are more and more used to encourage environmental protection and other causes. Nevertheless, these a priori win-win arrangements between firms and environmental unions through the marketing of an impure public good can generate adverse and unexpected effects. Thanks to a simple model, we identify several possible counter-productive effects such as the likelihood of over-consumption or the crowding out of direct contributions. These effects can be increased or decreased according to market structures and initial donation behavior of consumers. We also add survey evidence regarding the effects of cause related products. Several policy implications are drawn.

**Key words:** Fund-raising; Donation behaviour; Exchange; Cause related products; Environmental Protection.

**JEL codes:** M31

## **Adding Environmental Protection To Exchange : More Harm Than Good ?**

### **1. Introduction**

In everyday choice, consumers are more and more confronted with cause related products. If the consumer decides to purchase the product or service, the firm commits itself to fund a non-profit organization either automatically or conditionally, *i.e.*, after some conditions are met by the consumer. For instance, Endangered Species Chocolate (<http://www.chocolatebar.com/>) considers chocolate purchases as ‘a medium to save species, conserve habitat and honour human life. (...). The corporation donates 10 per cent of its net profits to environmental organizations that work to help endangered species and their habitats’. In the same vein, the French bottler of mineral water launched a campaign in several countries under the commitment ‘Drink 1, Give 10’ in partnership with UNICEF (<http://www.drink1give10.com/>). In short, for each litre of bottled water purchased, Volvic provides ten litres of drinking water to people in different African countries. According to a recent study by Cone (2009), ‘79% [of Americans] would be likely to switch from one brand to another brand if the other brand is associated with a good cause’.

These partnerships are widespread and have the potential to raise significant funds for not-for-profit organisations and to increase bottom-line profits for businesses. While the marketing literature on cause related products is well developed and mainly case-oriented, purchase triggered donation have not benefited from substantial economists’ attention. Without purporting to be exhaustive, the marketing literature has notably investigated reasons pushing businesses and not-for-profit organizations to engage in these partnerships and their consequences for each partner, including consumers (e.g., Varadarajan and Menon, 1988; Strahilevitz and Meyers, 1998). Considerable attention has been devoted to practical dimensions shaping the effectiveness of these business deals such as the ‘fit’ between causes and businesses (e.g., Pracejus and Olsen, 2004). From an economic viewpoint, cause related products can be perceived as a practical way to increase private provision of public goods. Indeed, by adding charitable causes or environmental protection to exchange, people can purchase impure public goods and possibly increase their individual contributions to public goods provision (Kotchen, 2005, 2006). Exploring another direction, a recent contribution in behavioural economics has shown in many donation settings people have difficulties to estimate a socially acceptable donation amount. Therefore they prefer opportunities that provide them with an anchor price. This difficulty can be overcome thanks to cause related products where the value of the material good plays this anchoring role and signal a reference price (Briers et al., 2007).

Departing from the usual win-win perspective of these arrangements, we argue that cause related products can lead to adverse and unanticipated effects. Some unintended effects of cause related marketing has been developed by Stole (2008), but the analysis is mainly conducted at a macro-level. The author argues that these practises are mainly ‘window dressing, a way to improve public image while detracting attention from a business’s own role in undermining the public safety net’. In the framework developed below, we show that under some plausible circumstances, cause related products can inadvertently worsen the initial situation (without cause related products) by generating an environmental degradation rather than an overall environmental improvement. Indeed, because of cognitive and behavioural biases, consumers can behave in way that can lead to counterintuitive results. For instance, cause related products can push consumers to consume more. If they increase consumption up

to a certain level, the unit improvement resulting from the donation is more than offset by additional purchases leading to an overall environmental degradation.

The remainder of the paper is organised as follows. In the next section, we expose the possible impacts on the environment due to cause related products in a simple model and emphasize the possible adverse effects. In section 3, we add empirical evidence gathered thanks to a consumer survey (N= 164) devoted to cause related products. Section 4 discusses the circumstances under which the previously identified adverse effects are more likely to arise and stresses some policy implications. Section 5 concludes and suggests directions for future research.

## 2. A theoretical framework

Cause related products (CRP) establish new relationships between three categories of agents: manufacturers, environmental unions and consumers. At first glance, we consider that these agents have their conventional constrained objective functions. Manufacturers and environmental unions seek to maximize respectively profits and environmental quality under budget constraints. Consumers seek to maximize their utility under budget constraints. We assume that consumers are willing to donate for the environment for several non-mutually exclusive motives such as pure and impure altruism, reciprocity or commitment to social norms (Croson, 2007).

The aim of the theoretical framework is to analyse whether associating an environmental cause to a product will actually improve the environment given that there exist negative side-effects such as crowding out and/or over-consumption. To reach this goal, we compare two economies. An economy A where consumers allocate their budget between two conventional goods,  $x$  and  $w$ , and a direct donation to an environmental NGO,  $y$ . And an economy B somehow similar to economy A except for the product  $x$  for which the manufacturer pledges to contribute a set amount of the product price,  $z$ , to an environmental cause. In other words product  $x$  becomes a cause related product (CRP): each unit of CRP<sup>1</sup> purchased corresponds to an indirect donation,  $z$ . We will compare both economies in order to analyse whether tying an environmental cause to a conventional good can lead to an environmental improvement.

We will consider two particular cases: first, consumers who already devote a part of their budget to an environmental NGO via direct donations and second, consumers who do not donate directly to an environmental cause, *i.e.*,  $y=0$ .

### Consumer behaviour

Consumer preferences can be represented by the following utility function

$$U(\alpha) = (1 + \alpha z)\sqrt{x} + \sqrt{w} + \beta y \quad (1)$$

where  $\alpha$  and  $\beta$  can be interpreted as parameters of environmental consciousness.

Notice that in the case no cause is related to good  $x$ , we set  $z$  equal to 0. Similarly, in the case consumers don't donate directly to the environmental cause,  $\beta=0$ .

The budget constraint can be written as

$$R = (p_x + z - a)x + p_w w + y \quad (2)$$

Consumer demand for the products  $x$  and  $w$  can be derived from utility maximisation under the budget constraint (2). We consider two cases:  $y=0$  and  $y>0$ . In the first case, consumers do

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<sup>1</sup> In this basic framework, there are no transaction costs. Including transaction costs in the analysis can offer fruitful extensions.

not donate directly to an environmental cause. The environmental consciousness is not sufficiently high<sup>2</sup> and consumers will prefer consumption of private goods. The demand for product x and w will depend on product prices. A price increase of product x will result in a decrease of demand for product x and consequently lead to an increase in demand of product w. If the product x is a CRP, demand also depends on environmental consciousness and the amount given to the environmental cause per unit purchased (see Table 1). Tying an environmental cause to a product is a way for the NGO to convey information to consumers on the existence and importance of the environmental cause. Moreover, the ‘automaticity’ of donations and the small amount involved in many CRP arrangements can lead more people to be generous, even unconsciously. It seems therefore realistic to assume that  $\alpha \geq \beta$ .

*Table 1: consumer demand if consumers don't donate directly to an environmental cause*

	No cause related product Economy A	With cause related product Economy B
Good, x	$x_{00}^* = \frac{p_w}{p_x(p_x + p_w)} R$	$x_{z0}^* = \frac{(1 + \alpha z)^2 p_w}{p_z(p_z + (1 + \alpha z)^2 p_w)} R$
Conventional good, w	$w_{00}^* = \frac{p_x}{p_x(p_x + p_w)} R$	$w_{z0}^* = \frac{p_z}{p_z(p_z + (1 + \alpha z)^2 p_w)} R$

In the second case, we consider that consumers do donate directly to an environmental cause (cf. Table 2). The substitution in demand will be balanced by direct donations, *i.e.*, a price increase of a product x (or w) will benefit to direct donations and doesn't increase the demand for product w (or x).

*Table 2: consumer demand if consumers donate directly to environmental NGO*

	No cause related product Economy A	With cause related product Economy B
Direct donations, y	$y_{0\beta}^* = R - \frac{1}{4\beta^2 p_x} - \frac{1}{4\beta^2 p_w}$	$y_{0\beta}^* = R - \frac{(1 + \alpha z)^2}{4\beta^2 p_z} - \frac{1}{4\beta^2 p_w}$
Good, x	$x_{0\beta}^* = \frac{1}{4\beta^2 p_x^2}$	$x_{z\beta}^* = \frac{(1 + \alpha z)^2}{4\beta^2 p_z^2}$
Conventional good, w	$w_{0\beta}^* = \frac{1}{4\beta^2 p_w^2}$	$w_{z\beta}^* = \frac{1}{4\beta^2 p_w^2}$

Demand for product x, w and donations are highly dependent on product prices. Adding an environmental cause to product x, implies that the firm will give a part z per unit sold to the environmental NGO. The firm may decide the part of this amount that will be paid by consumers. In other words, in the case of a CRP, the price of product x can be written as  $p_x = p_x + z - a$  where a is the financial part of the firm to the environmental cause.

<sup>2</sup> It might also reflect a situation where consumers possess little information on the environmental cause or on the environmental NGO. For this reason  $\alpha$  and  $\beta$  aren't similar.

### Cause related product pricing

How will prices be set by a firm if an environmental cause is related to the product?

Interestingly, we can easily show that a firm that chooses to relate an environmental cause to the product  $x$ , will not adopt the same strategy if the initial market is competitive or not. In the case, the market of product  $x$  is monopolistic, the market price, before adding the cause, will be monopolistic, which allows profit maximizing. Then adding a cause will not alter the price decision. *A contrario*, if the initial market of product  $x$  is competitive; the firm will not bear entirely the indirect donation and will transfer it (at least partly) on consumers.

We suppose that the market of product is competitive and firms adopt marginal cost pricing;  $p_w = c_w$ .

In an economy where consumers spent a part of their budget to direct donations, there is no substitution between products  $x$  and  $w$ . Adding an environmental cause to the product  $x$  allows the producer to create market power and earn monopolistic profits by rising the product price (rf. Table 3). In other words, the firm will not pay the whole indirect donation itself but will pass a part on consumers ( $c_x$ ). A perverse situation may arise when the marginal cost is above the promised donation per unit sold. Under cover of supporting a cause, the firm can extract from consumers more than what it will pay to the cause and achieve extra profits. The environmental cause allows the firm to acquire monopolistic market power.

	No cause related product Economy A	With cause related product Economy B
<b>Competitive market</b>		$a^{c*} = z - c_x$
Price of good $x$	$p_x^{c*} = c_x$	$p_z^{c*} = 2c_x$
Market supply, $x$ if consumers do donate	$x_{o\beta}^{c*} = \frac{1}{4\beta^2 c_x^2}$	$x_{z\beta}^{c*} = \frac{(1 + \alpha z)^2}{16\beta^2 c_x^2}$
<b>Monopolistic market</b>		$a^{c*} = z$
Price of good $x$	$p_x^{m*} = 2c_x$	$p_x^{m*} = 2c_x$
Market supply, $x$ if consumers do donate	$x_{o\beta}^{c*} = \frac{1}{16\beta^2 c_x^2}$	$w_{z\beta}^* = \frac{(1 + \alpha z)^2}{16\beta^2 c_x^2}$

*Table 3: firm behaviour if consumers already donate directly to the environmental NGO*

If consumers do not directly donate to the environmental cause, pricing behaviour is more complicated (rf. Table 4). Indeed, there is a substitution effect between  $x$  and  $w$ , which induces the firm, if  $x$  is marketed in a monopolistic market, to increase the price level. We show that the price distortion is even more accentuated in this case. Again, adding an environmental cause to product  $x$  is a way for firms to obtain market power. The price of CRP is fixed at monopolistic level. The only situation in which the firm totally bears the indirect donation occurs when product  $x$  is marketed within an economy with monopolistic market power and where consumers do donate already directly to the environmental NGO. In this

particular case the monopolistic firm is unable to benefit from an even higher monopolistic power as consumers will compensate towards direct donation. The benefit of proposing CRP is a higher demand for product  $x_z$ .

We suppose over-consumption to arise in markets where CRP are offered by monopolistic firms. Over-consumption induces higher pollution but may also imply a reduction in direct donations.

### Environmental Impact

Let us analyse the overall impact of the introduction of cause related products, on the state of the environment,  $I$ .

$$I = \delta Y - \varepsilon X - \varphi W = \delta (y^* + zx^*) - \varepsilon x^* - \varphi w^* \quad (3)$$

We suppose that the overall environmental impact in the economy is function of

- ✓ the amount of *donations* to the environmental non-profit organisation. Donations are either collected through direct donations,  $y$ , or through indirect donations (CRP),  $zx_z$ .  $\delta$  corresponds to the efficiency of the NGO to depollute, ie the depollution per monetary unit
- ✓ the *environmental degradation of consumption*, which depends on the overall quantity of consumed. From cradle to grave, each product generates an environmental degradation. Products  $x$  and  $w$  don't necessarily pollute similarly. We suppose that  $\varepsilon$ , respectively  $\varphi$ , corresponds to the unit pollution level of product  $x$ , respectively  $w$ . Notice that relating an environmental cause to product  $x$  doesn't modify its pollution impact.

Interestingly, the introduction of cause related products is likely to affect the environment both positively and negatively according to the sub-effects considered and their relative magnitudes.

We can distinguish two main effects: an over-consumption effect and a crowding out effect.

- ✓ The *over-consumption effect*, which is captured by  $\varepsilon (x_z^* - x_0^*) + \varphi (w_z^* - w_0^*)$ . In the case consumers are sensitive to the cause related to product  $x$ , it may push consumers to consume more. A recent study combining in-store shopping and on-line shopping showed that for various products cause-related message led to 'a substantial sales lift relative to the generic corporate advertisement' (Cone, 2009). For instance, the study reported a 74% increase in actual purchase for a shampoo brand when associated with a cause. The consumption of the good *per se* and regardless of any financial contribution to an environmental organization causes an increase in the level of pollution. An increase in sales is more likely to appear if the price of product  $x$  remains identical. An increase in sales of product  $x$  is not necessarily painful. If consumers orientate their consumption towards product  $w$  it will depend on the environmental impact of product  $x$  and  $w$ , whether over-consumption will negatively impact the environment.

✓ The *crowding-out effect*, which corresponds to the sum of two terms,  $(y_z^* - y_0^*) + zx_z^*$ . If consumers do not donate directly to the environmental cause,  $y=0$ , there is no crowding out effect. Relating an environmental cause to product  $x$  allows the collection of indirect donations. *A contrario*, if consumers devote already a part of their budget to direct donations, consumption of CRP might change their direct donation decision. It may push consumers to reduce their direct donations (i.e. if  $(y_z^* - y_0^*) < 0$ ) as they consider that through purchases they support the environmental cause. The overall effect is ambiguous and depends of the magnitude and ‘interactions’ of each kind of donations. In some plausible circumstances, a decrease in direct donations (caused by indirect donations) can be under-compensated by indirect donations, leading to a decrease of overall funds raised by the not-for-profit organizations. This situation is more likely, given that most of the time, indirect donations are relatively small compared to direct donations (Briers et al., 2007). Sometimes, the exact amount pledged to the environmental cause is not clearly communicated to consumers or ‘exploit’ the consumer inexperience in computing it (e.g., ‘for each product sold, a tree is planted’), which can reinforce the likelihood of crowding-out direct donations. In other cases, cause related products can also crowd-in direct donations. For instance, if  $(2 + \alpha z)\alpha z(p_x^*)^2 - 2(z - a)p_x^* - (z - a) > 0$ , consumers will increase the consumption of  $x$ . As the consumption level of  $w$  remains constant, the direct donation will increase. We can see that for  $a=z$ , direct donations will increase in an economy with CRP (compared to an economy with only conventional goods).

If each consumer perceives the environmental improvement per unit of product due to the indirect donation but does not compute the overall environmental impact of his increased consumption, the overall outcome can be an unexpected environmental degradation (Bougherara et al., 2005). This environmental degradation is not necessarily offset by the environmental improvement of indirect donations. In this particular case, an over-consumption might harm the environment. Interestingly, a price increase prevents over-consumption.

In sum, when the negative effects exceed the positive effects, a counter-productive result, *i.e.*, an environmental degradation rather than an environmental improvement is likely to arise. We can distinguish different situations for which the introduction of CRP leads to an environmental degradation (see Figure 1).

[Insert Figure 1]

Let us discuss in the following section some policy implications of this analysis.

### 3. Cause related products: more harm than good?

In some circumstances, introducing cause related products can lead to counter-productive outcomes from the environmental quality viewpoint. Interestingly, some products are more subject than others to adverse effects. For instance, all products are not likely to be over-consumed alike (Bougherara et al., 2005). In the same vein, Cone (2009) showed that sales increase due to cause related marketing are far from identical across products. Intuitively, we contend that paper is more likely to experience a consumption increase than televisions, for example. In addition, the life cycle of some products is more polluting than others, which means *ceteris paribus* that increasing their consumption can be more harmful for the environment than a similar increase of less polluting products.



Given that the price effect can attenuate the over-consumption risk, products for which donations do not cause (or are not perceived to cause) a perceptible price increase, are more likely to be over-consumed, increasing the likelihood of an environmental degradation. Interestingly, while consumers can perceive a price increase as a strategy of the manufacturer to make them incurring the whole cost of the donation, such a price increase can be useful to prevent over-consumption. Similarly, when manufacturers incur the whole cost of donations by reducing their own margins or when environmental unions agree on very small amounts, over-consumption and its environmental consequences are more likely. It can be interesting to compute consumer's reactions (i.e., a kind of donation elasticity) to various couples of donations and price increases to acquire a better knowledge of the over-consumption risk. Moreover, manufacturers' interests and unions interests can diverge. While the former can seek to increasing quantities sold, environmental unions can seek to increase funds raised and ultimately environmental improvements. These circumstances also question the true (and not only the self-claimed) arguments of the objective function of environmental unions and their relative weights.

In addition, cause related products can reinforce or crowd-out pre-existing donations. Indeed, if consumers perceive cause related products as a substitute for their previous donations, it can lead to an overall decrease in funds raised. For instance, if cause related products are directed at consumers who were previously offering direct donations, the crowding out effect is more likely. Several parameters can help in estimating the potential effects of cause related products on overall funds raised, such as the proportion of 'direct' donors in the whole population, the average donation amount and the donors' sensitiveness to 'crowding out'. A natural managerial implication for environmental unions will be to target consumers who are not direct donors. Rather than adopting a one-size-fits-all strategy, companies and environmental unions can have to negotiate on which subsets of the population to target cause related products in order to avoid such a crowding out effect<sup>3</sup>. Moreover, we have assumed that the efficacy of funds collected directly or through the manufacturer are identical at generating environmental results. If it is not the case, the analysis becomes more complex. In some cases, given the small overlap between direct contributors and the great number of potential contributors through cause related products, the possible loss due to crowding out can be more than offset. Lastly, designers of these partnerships have to be cautious and consider their possible effects over time, given that crowding-out can last, even after stopping the operation and be contagious to other non-targeted domains (e.g., Gneezy and Rustichini, 2000).

#### **4. An exploratory empirical investigation**

In order to add empirical evidence to the analysis developed above, we achieved a survey on a convenience sample (N=164) recruited among faculty, staff, students and their relatives at a higher education institution in Montpellier, South of France, namely at Montpellier SupAgro. The survey administered asks various questions about households' practices, knowledge, behaviour and preferences regarding cause related products. All respondents were also asked about their age, gender, education, monthly income to test whether these socio-demographic variables are related to some choices. In January 2010, we administered the anonymous one-

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<sup>3</sup> For instance, du Halgouet (2010) indicates that Sidaction (a French association devoted to fight against AIDS) 'discriminates between donators and do not ask from regular donators to purchase cause -related products'. (<http://ong-entreprise.blogspot.com/2010/06/les-produits-partage-restant-lapanage.html>, Consulté le 27 août 2010).

page survey instrument<sup>4</sup> to various individuals on the campus. Thanks to data collected, we investigate the following hypotheses:

- ✓ H1: People know cause related products and have already purchased these kinds of products.
- ✓ H2: Consumers are willing to pay a premium for cause related products or at least to choose them rather than similar products, *ceteris paribus*.
- ✓ H3: Cause related products can push consumers to consume more, either from the same product or from products from the brand supporting the cause (over-consumption hypothesis)
- ✓ H4: Cause related products can lead to decrease of other kinds of donations (crowding out hypothesis).

In the two surveys, women (55%) are more represented than men (45%). The average age in the sample is 36.8 years, varying from 15 to 85 years. 46% of respondents are single and 54% are in couple. A more detailed figure of descriptive statistics on the two samples is reported in table 2.

**Table 2. Descriptive statistics regarding the convenience sample (N=164)**

Variables	Number and percentage
Number of women	91(55%)
Number of men	73(45%)
Average age	36,8 (Min=15; Max=85)
<b>Matrimonial status</b>	
Single	74 (46%)
Couple relationship	88(54 %)
At least one child	72(44 %)
Number of people with an university education	130(79%)
<b>Income per month</b>	
- < 1000 €	55(34%)
- Between 1000 and 1500 €	16(10%)
- Between 1500 and 2000 €	20(12.5%)
- Between 2000 and 3000 €	25(15.6%)
- > 3000 €	44(27.5%)

Even if data collected by declarative surveys present some inherent limits, we contend that they can provide useful information, especially regarding trends among consumers. Rather than competing with more accurate empirical investigation, they allow to investigate quickly and cheaply some directions suggested by theoretical analysis. The four hypotheses developed above are more or less supported by data. Regarding hypothesis 1, 67% of surveyed individuals know cause related products. Among them, 39% have already bought cause-related products (H1). In the same vein, 61% of respondents declare that they are ready to pay a premium for cause-related products. Among people willing to pay a premium, 55% and 44 % state that they are willing to pay a premium between 0 and 5% and 5 and 10% of the per-unit price (H2). Moreover, 94.5% of respondents are ready to change their usual product in favor of cause related products if the price and the quality of the product are similar. 44% (22%) of the surveyed individuals state that cause association can push them to consume more of the concerned product (brand) (H3). Interestingly, 16.5% of respondents stated that cause related products will reduce their other kinds of donations such as volunteering or direct

<sup>4</sup> The French version of the survey instrument is available upon request.

donations (H4). Lastly, using logistic regression, we tested whether the probability of choosing a cause related product was related to socio-demographic variables reported in table 2. The results (not shown here) are inconclusive and do not allow to draw any clear cut regularity.

## **5. Conclusion**

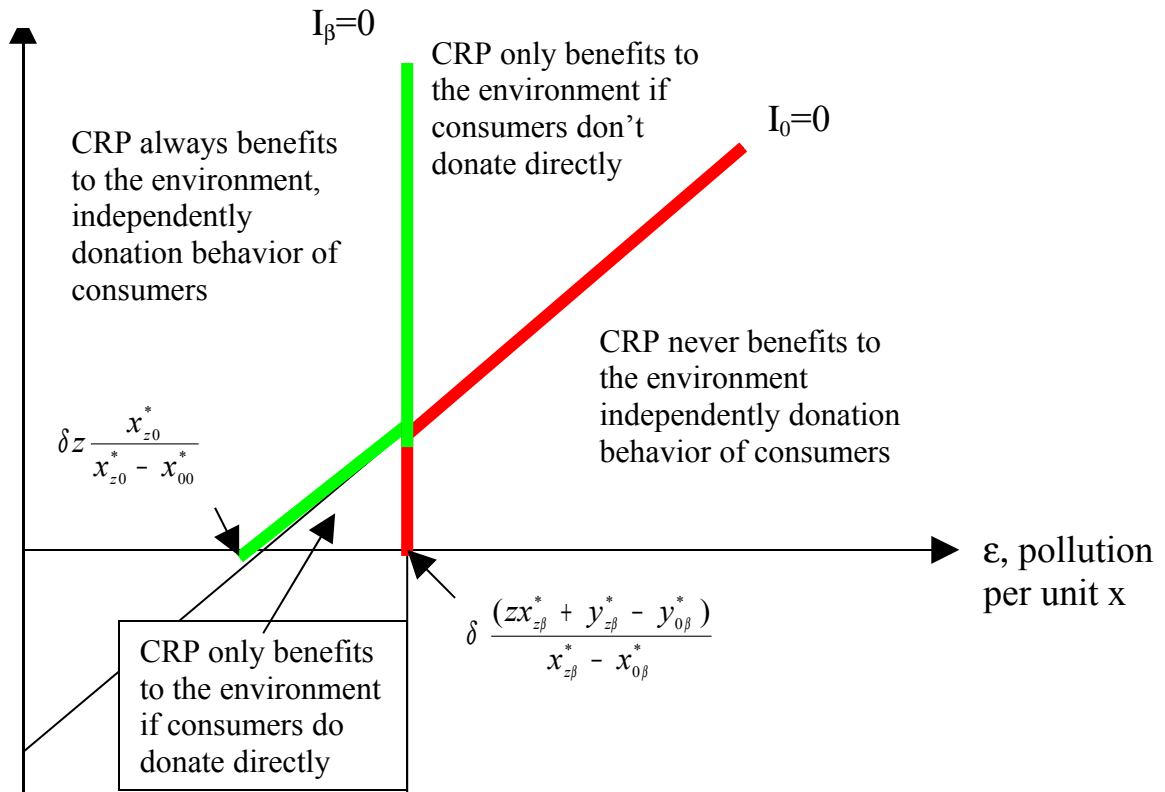
Departing from the conventional or popular wisdom where cause related products are a win-win-win strategy, we showed that they can lead to counter-productive results from an environmental protection strategy. Environmental degradation rather than environmental improvement can occur. These outcomes can be due to various combinations of several effects, namely over-consumption, crowding-out of direct donations and price effects. Designing effective cause related products is a complex task requiring a deep analysis of interactions between several parameters such as the impact of indirect donations on products price, the environmental impact of products, the pre-existing behaviour in terms of donations. Moreover, a situation is not fixed and can vary across time and space. Our modelling is simple and can be extended in various directions, some of them have been indicated all along the text. For instance, questioning the objective functions attributed to environmental unions, by distinguishing either raising funds or protecting the environment of agents can seriously influence the end-impact of cause related products.

## References

- Bougherara, D., Grolleau, G., Thiébaud, L. (2005). Can labelling policies do more harm than good? An analysis applied to environmental labelling schemes. *European Journal of Law and Economics*, 19, 5-16.
- Briers, B., Pandelaere, M., Warlop, L. (2007). Adding exchange to charity: A reference price explanation. *Journal of Economic Psychology*, 28(1), 15-30.
- Cone, 2009, Past. Present. Future. The 25th Anniversary of Cause Marketing, <http://www.coneinc.com/stuff/contentmgr/files/0/8ac1ce2f758c08eb226580a3b67d5617/files/cone25thcause.pdf>.
- Croson, R., 2007, Theories of Commitment, Altruism and Reciprocity: Evidence from Linear Public Goods Games, *Economic Inquiry*, 45(2), 199-216.
- Grolleau, G., Ibanez, L., Mzoughi, N. (2009). Too much of a good thing? Why altruism can harm the environment?. *Ecological Economics*, 68(7), 2145-2149.
- Kotchen, M.J. (2009). Offsetting green guilt. *Stanford Social Innovation Review*, 7(2), 26-31
- Kotchen, M.J. (2006). Green Markets and Private Provision of Public Goods. *Journal of Political Economy*, 114(4), 816-834.
- Pracejus, JW.; Olsen, G. Douglas, 2004, The role of brand/cause fit in the effectiveness of cause-related marketing campaigns, *Journal of Business Research*, 57, 635-40.
- Stole, I.L. (2008). Philanthropy as Public Relations: A Critical Perspective on Cause Marketing. *International Journal of Communication*, 2, 426-440.
- Strahilevitz, M., Myers, J.G. (1998). Donations to charity as purchase incentives: How well they work may depend on what you are trying to sell. *The Journal of Consumer Research*, 24(4), 434-446.
- Varadarajan, PR., Menon, A. (1988). Cause-related Marketing: A co alignment of marketing strategy and corporate philanthropy. *The Journal of Marketing*, 52(3), 58-74.

**Appendix 1**

$\phi$ , pollution per unit  $w$



*Figure 1 : overall environmental impact of cause related products*

## Appendix 2

	No cause related product Economy A	With cause related product Economy B
<b>Competitive market</b>		$a^{c^*} = z - \sqrt{c_x(c_x + (1 + \alpha z)^2 c_w)}$
Price of good x	$p_x^{c^*} = c_x$	$p_z^{m^*} = c_x + \sqrt{c_x(c_x + (1 + \alpha z)^2 c_w)}$
Market supply, x if consumers do not donate	$x_{00}^{c^*} = \frac{c_w}{c_x(c_x + c_w)} R$	
<b>Monopolistic market</b>		$a^{c^*} = z - \sqrt{c_x(c_x + (1 + \alpha z)^2 c_w)} + \sqrt{c_x(c_x + c_w)}$
Price of good x	$p_x^{m^*} = c_x + \sqrt{c_x(c_x + c_w)}$	$p_z^{m^*} = c_x + \sqrt{c_x(c_x + (1 + \alpha z)^2 c_w)}$
Market supply, x if consumers do not donate	$x_{00}^{m^*} = \frac{c_w}{2c_x(c_x + c_w) + (2c_x + c_w)\sqrt{c_x(c_x + c_w)}} R$	

*Table 4: firm behavior if consumers do not donate directly to the environmental NGO*