

Eco-labelling schemes faced with selfish or altruistic consumer motivations and with the public or private nature of environmental attributes

The success of eco-labelling is due to the combination of two main factors: on the one hand, the interactions between the private or public nature of environmental attributes (i.e. the type of individual or collective benefits they provide) and on the other hand the number of consumers with selfish or altruistic social behaviour. This second factor, particularly, helps understand why some eco-labels applied to the same type of products and with a fixed level of private and public attributes work differently according to the country. We show that if some consumers' altruism level is high, their purchasing behaviour may prevent more "selfish" consumers from having access to the eco-labelled good, and therefore, reduce the desired global environmental benefit. Moreover, it seems important to avoid a uniform policy by setting up marketing strategies adapted to different segments of consumers.

In most developed countries, the number of eco-labelling schemes of private or public origin has considerably increased so as to allow consumers to differentiate between products according to their environmental quality and to allow firms to promote their efforts. However, the success of these schemes, measured by the number and categories of products, is very heterogeneous across countries. For example, while the German eco-label *Blue Angel* includes more than 3500 products in 80 categories, the French eco-label NF-Environment only concerns 250 products in 15 categories. Within the same eco-labelling scheme, the number of products being labelled varies greatly from one product to another.

What company strategy in the presence of an eco-label?

Economists have taken a special interest in the ability of eco-labels to reduce the risks linked to information asymmetries in a credible way. Analysing eco-labelling schemes in terms of information asymmetry is certainly useful but insufficient because it does not explain all the success factors of these eco-labels. With a simple theoretical model in which the variations in performances between schemes depend on the

interactions between the more or less public nature of environmental attributes and the more or less altruistic motivations of consumers, we analyse the strategy of a firm in a monopolistic situation and deciding to implement an eco-label.

The analysis of the firm's profit function shows that the firm must consider whether to sell to all consumers at a rather low price or only to altruistic consumers at a higher price (see table 1). The strategy is determined by the respective number of altruists and egoists in society (see frame 1), but also by the level of altruism of the altruists and the degree of complementarity between the private and public characteristics of the good (see frame 2). In a more formal way, when the degree of complementarity is rather low, the relative variation in prices between the targeting strategy (sell only to altruists) and the mass strategy (sell to both types of consumers) is high, something which might cause the firm to sell the eco-labelled product to altruists only, a strategy which maximises its profit (see Figure 1).

Table 1: Analysis of eco-labelled product purchasing

		Consumer type	
		Selfsh	Altruistic
Nature of product attribute	Private attributes	Concerned by purchase	Concerned by purchase
	Public attributes	Not concerned by purchase	Concerned by purchase according to level of altruism

It may be that the firm adopts a niche strategy in case there are not many altruists in the economy. In that case, the altruists are willing to pay a much higher price for the eco-labelled product than the egoists are, especially in the absence of private benefit associated with the eco-label. Supposing that the firm cannot discriminate between both groups, *if the degree of altruism is quite high, the altruists prevent selfish consumers from buying the eco-labelled product.*

Therefore, if altruists show less obvious motivation to improve social welfare, the price of the environmental goods is likely to come down and allow a larger number to have access to these goods. If price discrimination is possible, such a counter-intuitive phenomenon would however be less likely to happen.

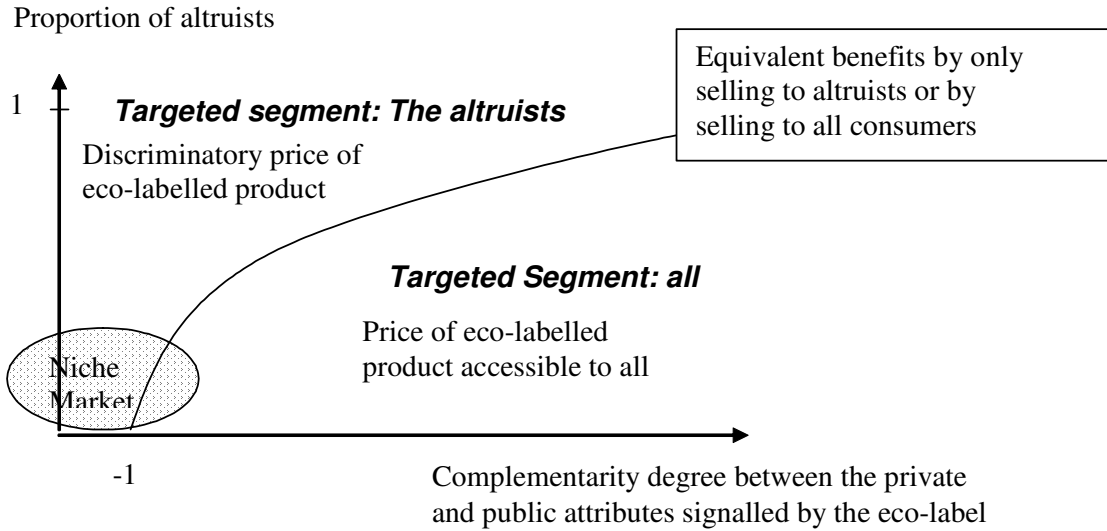
Frame 1: Motivations to purchase environmental goods

Consumers may adopt selfish or altruistic behaviours. This hypothesis is also based on various experiments. Environmental preferences include a wide variety of motivations ranging from pure selfish considerations to pure altruism. Between these two extreme positions, consumers may express various forms of impure altruism, like the “warm glow”, that is to say questing for a (social) status via consumption of public goods and identity considerations. In a survey of the Nordic Swan Eco-label for several products (toilet paper, kitchen paper, detergents), Bjorner *et al.* (2004) conclude that consumers were motivated by altruistic considerations, because the products did not provide any direct additional benefit. The main differences between selfish and altruistic consumers may be analysed in the following way: the first are willing-to-pay a premium if the eco-labelled product provides private benefits. These private benefits depend on the quantity of private characteristics which are complementary to the public benefits offered by the eco-label. In other words, the egoist behaves as *homo economicus*. The altruistic consumer does not only look for better environmental quality, but also appreciates the fact that other people in society are benefiting from that better quality. In extreme cases, that is to say when the agent is purely altruistic, he behaves like an environmentally friendly public decision maker (*homo politicus*). It is important to note that whatever their decision to purchase the eco-labelled product or not, all people benefit from the public advantages created by others’ behaviour.

Frame 2: Complementarity of eco-labelled public and private attributes

The environmental attributes of products may be vectors of private benefits (lesser energy consumption, cut in pesticide residues) or public ones (reduction in greenhouse gases) and their proportion varies from one product to another. For instance, the production of organic fruit and vegetables generates less soil and water pollution but also presupposes less pesticide residues. While the first attribute has a significant public dimension, the second one clearly has a private dimension since consumers see these lower levels of pesticides as lowering their health risks. In France, the Consumers’ Association (*Les Consommateurs et le Monde Agricole*, Paris, 1998) argues that consumers often see environmentally friendly farming practices as an indicator of better food safety and of better flavour. Conversely, private benefits seem to be much smaller for produce from sustainably managed forests, green electricity or even tuna caught according to dolphin friendly methods, as consumers consider the environmental quality of a sustainably managed forest (carbon storage, greenhouse gas reduction), for example, as being mainly public. Some public benefits may even go against other private benefits. For instance, while food without nitrates and/or pesticides are often well received by consumers, other non food products, like washing powders and washing up products without chemical products may be perceived as less effective by consumers. This intuitive presentation must not hide the possible strategic uses of information aiming to increase the private nature of some environmental goods, such as dolphin safe tuna (Grolleau *et al.*, 2007).

Figure 1: Price choice and targeting strategies for a monopoly



Consumer characteristics and environmental impact of an eco-label

Even in the presence of strong pro-social considerations from the altruists and from a small number of consumers purchasing the eco-labelled product, the public benefits created by the eco-label depend on the level of environmental quality provided by the firm. The environmental quality level per unit of product is always higher when altruists purchase the eco-labelled product than when the firm sells to both types of consumers. However, despite a higher level of environmental quality, the global level of public benefit is not always optimal when only altruists are targeted. In other words, *in some cases, when altruists prevent selfish consumers from purchasing the eco-labelled product, the global environmental benefit may be reduced* (see figure 2). A less pronounced motivation to improve social welfare among altruists is likely to increase the global environmental benefit of the eco-label because, as the altruistic consumer maximizes his own environmental benefit, he does not take account of the direct impact of his willingness-to-pay on the firm's strategy and ultimately on the eco-label's market share.

Therefore, the global environmental quality is better when the eco-label provides a lower level of environmental quality and is aimed at all consumers. This result shows a differentiating criterion according to the socio-economic context, namely the importance of the respective proportion of altruists and egoists in the population as a whole in relation to a given eco-product, the eco-product itself being characterized by a proportion of private and public benefits.

Implications for the success of eco-labelling schemes

It is crucial to understand the interaction between the private/public nature of products and the consumer type in order to anticipate the success of eco-labelling schemes.

First of all, do consumers perceive the promised environmental attribute as being private or public? To some extent, this perception of private or public nature may be influenced (Beretti et al. 2009). The way private benefits may be improved to attract selfish consumers is particularly interesting. Increasing the private

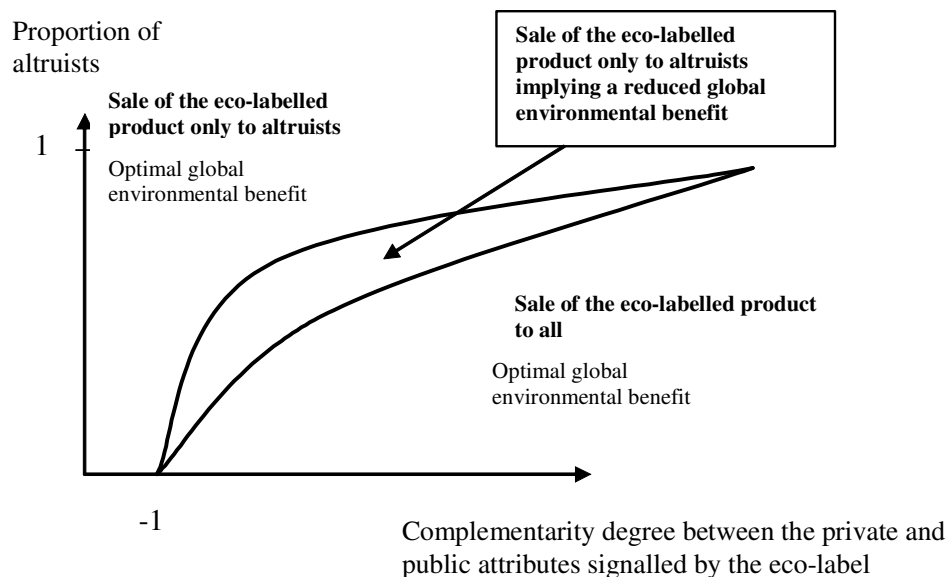
nature of the eco-labelled attributes of goods may take various forms: objective forms, that is to say based on science, or subjective ones, that is to say by playing on consumers' perceptions. Some eco-labels emphasize the benefits in relation to local public goods such as local groundwater, rather than global public benefits such as the impact on the ozone layer. In this way, an advertisement in Munich informs consumers that purchasing a litre of milk or 100 grams of cheese in their water catchment area helps protect the quality of 12,500 litres of water.

The cost associated with an increase in the private nature of attributes varies according to the categories of eco-labelled products, partly because of the *ex ante* perception of consumers. Intuitively, this cost is lower for low energy products or agrifood products than for environmentally friendly wood or green electricity. Knowing the degree of the private dimension which should be reached at a given cost may be interesting for public decision makers and may allow them to compare and select categories of products according to the anticipated net global environmental effect.

However, the conceivable investment to promote the private dimension of some eco-products may generate overflowing effects (the benefits gained from an advertisement praising the better taste of organic oranges will very likely profit all the firms marketing organic oranges and not only the firm paying for the cost of this advertisement), which may reduce private agents' willingness to make that type of investment.

Second, do consumers adopt altruistic or selfish behaviour for a given product? Consumer behaviour is neither necessarily identical for all products, nor stable over time. The same consumer may behave in an altruistic way with some products and selfishly with others. Intuitively, a bad match between the environmental attributes put forward and the consumer type may lead to a failure of an eco-labelling scheme. The promoters of these schemes may try to introduce an (impure) altruism, for example by increasing the status benefits which may result from the consumption of eco-labelled products. The success among environmentalists of the Toyota Prius hybrid car was partially explained by its ability to generate social status in Prius drivers compared with similar other cars (Naughton and Chapman, 2007).

Figure 2: Global environmental impact of the ecolabels



Similarly, consumers' motivations may change over time or vary from one country to the next. Without excessive generalization, it is often thought that German consumers have higher environmental awareness than French consumers. For example, the comparison by the Charities Aid Foundation between the donations made in 2006 to charitable causes as a percentage of GDP in France and Germany show that German citizens (22%) are more generous than the French are (17%), which is in line with our intuition. This difference may be due to attribution bias and longer-standing educational policies in Germany than in France, leading to the internalization norms, particularly in some fields (Müller, 2002).

Ultimately, environmental differentiation may fail if it does not take into account the multi-dimensional character of eco-labelling schemes. Though our model presents a simplified mechanism whereby eco-labelling schemes may harm the environment rather than improve it, it does not take other dimensions into account such as the eco-label performance measured by the number of products concerned or the degree of recognition among potential purchasers.

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