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Hedonic and environmental quality: A hybrid model of product differentiation☆

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ABSTRACT

In this paper, we analyze how strategic competition between a green firm and a brown competitor develops when their products are differentiated along two dimensions: hedonic quality and environmental quality. The former dimension refers to the pure (intrinsic) performance of the good, whereas the latter dimension has a positional content: buying green goods satisfies the consumer's desire to be portrayed as a socially worthy citizen. We consider the case in which these quality dimensions are in conflict with each other so that the higher the hedonic quality of a good, the lower the corresponding environmental quality. We characterize the equilibrium configurations and discuss the policy implications deriving from our analysis.

1. Introduction

In this paper, we analyze how strategic competition between a green firm and a brown competitor develops when their products are differentiated along two dimensions: hedonic quality and environmental quality. The former dimension refers to the pure (intrinsic) performance of the good, whereas the latter dimension has a positional content: buying "green" goods satisfies the consumer's desire to be portrayed as a socially worthy citizen. We consider the case in which these quality dimensions are in conflict with each other so that the higher the hedonic quality of a good, the lower the corresponding

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environmental quality. Finally, we evaluate the impact of a minimum quality standard, and compare our results with those deriving from a traditional model of vertical differentiation.[1]

Two main considerations inspire our analysis. First of all, people are increasingly concerned with environmental issues. This may be driven by personal interests, as caring about the environment also means caring about their own health and safety (Ostrom, 2000; Heffner et al., 2007; Carlsson et al., 2010; Deltas et al., 2013). Recent analysis also suggests that, when deciding about buying green goods, people are particularly sensitive to psychological and social concerns (Bateson et al., 2006). In 2007, the *New York Times* reported the top five reasons why Toyota Prius owners bought their hybrid cars. The main reason was that "it shows the world that its owner cares",[2] while having "only a basic understanding of environmental issues or the ecological benefits of HEVs (hybrid electric vehicles)" as pointed out by Heffner et al. (2007, p. 409). An environmentally friendly product may contribute to satisfy the desire to stand out as *socially worthy* (Ostrom, 2000), thereby providing buyers with some social/psychological benefits beyond the material needs that products traditionally satisfy.[3] On the contrary, when purchasing "brown" products, consumers may incur a social stigma as they fail to comply with a social/psychological norm of responsible citizens.[4] Drawing on this behavioral frame, one can explain for example why people are more likely to offer money in a public goods game to protect the environment when the giving is done publicly and thus visible to others (Milinski et al., 2006). The same argument also explains why home owners tend to overinvest in solar panels and underinvest in other green home improvements, such as additional insulation and window caulking; while the former investment is conspicuous and therefore it provides some social benefits, the latter is not.[5] *Green consumption is a byword for good citizenship, likewise brown purchasing leads to a blameworthy social image*. A consumption behavior contributes to define the social traits of an individual, thus its relative position among peers. Accordingly, the higher the relative environmental quality of a good, namely its ranking along the *quality ladder*, the higher its social value and the corresponding position it confers to the buyer along the *social ladder*. This represents the *first* ingredient of our analysis.

However, if this is the case, then why are brown goods still so popular? First of all, producing high quality goods does not necessarily imply a trade-off between the hedonic and the environmental dimensions. In some sectors, such as cosmetics, household and sometimes food, high hedonic quality standards can be obtained without sacrificing the environmental quality. Typical examples are given by non-animal tested cosmetics, ultra-concentrated detergents and dolphin-safe tuna. On the contrary, in other sectors, this trade-off is inevitable as certain brown goods meet consumers' requirements better than the green alternatives (Carrigan and Attalla, 2001; Gupta and Ogden, 2009; Weatherell et al., 2003). For example, conventional internal combustion engine vehicles, although dominated by green alternatives in terms of polluting emissions, are still superior in most cases to electric or hybrid vehicles based on pure performance. Paper produced from trees instead of recycled paper is often preferred because it is softer to the touch. The reprocessing of recycled plastic can be more challenging compared with virgin plastic. New generation washing machines have energy saving cycles labeled "green" or "eco"; they are, however, more time consuming in comparison with ordinary cycles. As Conrad states: "Although nowadays ecologically relevant behavior is expected from a consumer, there are still consumers who buy canned beer or bottled juice under a no refund claim system instead of buying beverages under the deposit-refund system. [. . .] They buy cars with a big engine and a bad mileage per liter gasoline instead of a threeliter car. They prefer to use the airplane instead of the train although of a relatively short travel distance, they purchase conventional bulbs instead of electricity saving bulbs or they prefer energy-inefficient halogen light instead of neon tubes" (Conrad, 2005, p. 1). Whatever the intrinsic driver to brown consumption, "there is a trade-off between utility derived from preferred characteristics of a product and the moral behavior of buying "green", expected by part of the society.[. . .] Producers are aware of the conflict of consumers between preferred characteristics and their environmental incompatibility. They know that customers, getting their preferred characteristics from an environmental friendly product, welcome that coincidence but if environmental aspects are missing, they might anyhow buy the product" (Conrad, 2005, p. 2). An immediate by-product of this discussion is that, when the aforementioned trade-off is evident, the ranking of a good along the quality ladder mainly depends on the importance that people attach to its environmentally friendly nature as compared to other attributes. The existence of a *conflict* between the social component of consumption and the individual-rationality-based motive constitutes the *second* ingredient of our analysis.

[1] Interestingly, this issue has been recently addressed by the European Commission in the Energy Union Package, where for the first time, the EU stated that consumers can play a key role in fighting pollution.

[2] http://www.nytimes.com/2007/07/04/business/04hybrid.html%3F_r=0%23addendums.

[3] Notice that this positional content has no direct relationship with the current regulation adopted in a specific country. Case in point, the automotive emissions standards set by the European Union. Two types of cars can meet the requirements, while having different emissions levels. From the EU viewpoint, both of them are *sufficiently* green and therefore do not incur any restriction to their circulation. However, from the consumers' viewpoint, the less pollutant the car, the more significant the contribution to the environment and therefore the better the social image they obtain.

[4] If consumers buy a product which lacks any environmental friendly characteristics, they might be burdened by a bad conscience since it is expected that people be environmentally aware (Conrad, 2005).

[5] Since Veblen (1899), this behavior has been well described by the theory of conspicuous consumption, in which the utility (or status) of a consumer depends, at least partially, on the comparison between her own consumption decision (and the quality of the product she buys) and that of others. Under conspicuous consumption, consumers are willing to pay a higher price for a functionally equivalent good in order to reveal their wealth, their social status or other specific characteristics. See Bagwell and Bernheim (1996) and Bowles and Park (2005) for recent contributions.