



Analysis

Green Consumption and Relative Preferences in a Vertically Differentiated International Oligopoly[☆]Giulia Ceccantoni^a, Ornella Tarola^b, Skerdilajda Zanj^{c,*}^a MEMOTEF, University of Rome, La sapienza Via Del Castro Laurenziano 9, Roma 00161, Italy^b DISSE, University of Rome, La Sapienza Piazzale Aldo Moro, 5, Rome 00100, Italy^c CREA, University of Luxembourg, 162A, avenue de la Faiencerie, L-1511, Luxembourg

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ABSTRACT

We consider an open to trade two-country model with two vertically differentiated goods and relative preferences in consumption. These preferences are such that consumers obtain satisfaction from their own consumption in relation to the consumption of the others. Product differentiation is along an environmental quality dimension and countries are asymmetric in average income. Analysing the equilibrium configuration, we find that, when relative preferences are relegated to the poorer country producing the brown good, the process of trade liberalization can favor the polluting firm, while penalizing the green rival. In these circumstances, trade liberalization can be environmentally detrimental. At the opposite, trade liberalization always favors the green producer when relative preferences are observed in both countries, with possibly positive effects on global emissions.

1. Introduction

“There is strong agreement across the EU about the ethics of environmentally-friendly products: 95% of respondents agreed that using environmentally friendly products is ‘the right thing to do’, 91% agreed that buying environmentally-friendly products sets a good example and 80% agreed that their family and friends would think it was a good thing if they used environmentally-friendly products.” (European Commission, 2013) (italics added by the authors).

Since the famous treatise by Veblen (1899), *conspicuous practices* intended as means to satisfy craving for power or social approval have been largely observed among consumers. While, for a long time, luxurious cars, expensive wine and apparel have been considered the key drivers for high social status, more recent approaches have identified further conspicuous goods for a relative position in the social community. For example, the environmental degradation of the planet has generated increasing concerns among people who are currently aware of the devastating effects of global pollution on public health. Protecting environment is viewed as a way to preserve the future of human beings and to care for relatives, peers and friends. As a natural by-product of this awareness, environmentally friendly products have been introduced in the set of conspicuous goods: green consumption is

nowadays a byword for good citizenship and green products are conspicuous means to get the status of good citizens.

The conspicuous content of green consumption opens the door to two considerations.

First, *the social reward for environmental protection shall be wider the more conspicuous are the goods*. Whenever the environmental quality gap between a green variant and an ordinary product is not extremely relevant, the contribution to environmental protection, and thus to the social community, coming from green consumption is not significant. In this circumstance, green consumers do not distinguish themselves from dirty buyers and thus do not obtain the visible status of socially worthy citizens. It is as if the product's ranking along the environmental quality ladder would determine the consumers' ranking along the social ladder. In 2007, the *New York Times* cited the main reasons why Toyota Prius owners bought their hybrid cars. It emerged that the buyers had ‘only a basic understanding of environmental issues or the ecological benefits of HEVs (hybrid electric vehicles)’ and they purchased only because ‘it shows the world that its owner cares’ (Heffner et al., 2007, p. 409).

Second, *the environmental concern determining the conspicuous dimension of green good is mainly country specific*. Individuals living in the same neighborhood or the same region and sustained by a same level of average income may share a set of shared values, behaviours and beliefs

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(Dietz et al., 2005; Steg and de Groot, 2012) that determine a common consciousness about the environmental issues as well as about the socially appreciated consumption attitudes/choices (Litina et al., 2016).¹ Nonetheless, countries are more and more involved in international agreements which liberalize trade and reduce the costs of export/import. As a consequence of this trade liberalization process, consumers living in different country, with heterogeneous income, culture and beliefs, get familiar with goods that they would not know in absence of trade.²

These considerations generate some questions that we try to give an answer in this paper. How the conspicuous dimension of green consumption affect the equilibrium configuration of the market? Countries differ not only in terms of culture and values but also in terms of income levels. Does the worldwide distribution of environmental consciousness play a role in curbing global emissions? What is the contribution, if any, of trade liberalization to the environment when taking into account that green goods can be perceived as conspicuous products?

We define a partial equilibrium model with two asymmetric countries as in Cabrales and Motta (2001) and two vertically differentiated goods where the green good is the high quality good.³ Consumers in each country are heterogeneous with respect to their willingness to pay for quality. Countries are asymmetric in terms of average income. The richer country produces a clean good while the latter, the poorer, specializes in the production of a brown good.⁴ Each country is populated by a firm. Each firm exports its product thereby facing an iceberg cost, which is lower the more liberalized trade is. Introducing this cost in the model enables to consider how the profitability to produce green versus brown goods changes with the process of trade liberalization.

When defining consumption behaviour in a country, we do not depart from the well-known concept of *homo economicus*, a rational and self-interested agent who traditionally maximizes his/her utility. Still, we reconcile this traditional approach with the idea that human beings are (at least partially) affected by social interaction and driven in their behaviour by some country specific social values. Thus, when consuming conspicuous goods, they obtain social benefits or incur social stigma, behind the material needs which are typically met. In line with this, we assume that goods are valued along two dimensions: their intrinsic quality and their social component. The former, in accordance with the traditional model of vertical differentiation à la Mussa and Rosen, is such that the absolute quality of a variant determines its utility. So, the green good is the high quality variant along the *quality ladder* since it dominates the competing and low-quality alternative from an environmental viewpoint. The latter induces consumers to value a variant depending on its relative environmental quality, namely the quality gap between the variant itself and the alternative one: this gap determines the social value of the good and thus fixes the status of her buyer along a *social ladder*. We formalize this social component through *relative preferences* and, borrowing some ingredients from Elhadj and Tarola (2015), we nest them in a vertically differentiated market.⁵

¹ Ultimately, these shared values provide social mechanisms which sanction any deviation from the set of appreciated attitudes and reward a compliant behaviour. Additionally, individual perceptions about the causes of pollution seem quite different among people living in rich and poor countries as reported by The Health of the Planet Survey (Dunlap and Metig, 1995). People living in rich countries show much more awareness about the role of their individual green versus brown consumption on pollution in the country of residence: feeling responsible w.r.t. environment belongs to a set of values arising after essential needs have been satisfied.

² For a dynamic analysis, with vertically differentiated goods, see Gabszewicz et al. (2017), who study how consumption habits evolve when countries open to trade.

³ A good survey of the industrial organisation models nested with international trade is Krugman (1989).

⁴ This assumption is in line with the traditional view of a North–South model of production where dirty productions are relegated in less developed countries, the green ones being rather in the more advanced groups of nations (see for instance Copeland and Taylor, 1994 and Fajgelbaum et al., 2011).

⁵ Relative preferences capture the idea that consumers obtain satisfaction from their

Accordingly, under the assumption of country-specific relative preferences, we characterize the equilibrium configuration of the oligopoly. In particular, we first describe the role of relative preferences by comparing this equilibrium with a baseline where relative preferences are absent. Second, under country-specific relative preferences, we study the effect of trade liberalization on the equilibrium configuration thereby evaluating the role of trade liberalization.

We consider different scenarios. After presenting the related literature (Section 2), we provide the presentation of the model in Section 3 and the description of the setup without relative preferences in Section 4. In Section 5, we characterize the scenario where consumers in both countries display relative preferences. Then, in Section 6 we assume that relative preferences emerge only in one country. We conclude in Section 7.

We find that relative preferences in both countries never reduce the optimal quantity of goods and the corresponding trade exchanges with respect to the baseline. Moreover, the twofold goal of increasing the production of green good at expense of the brown one and curbing global emissions is reached whenever trade liberalization is sufficiently significant. This shows that while some results could be true in a closed economy, they can cease to be valid in a more realistic world of open trading areas.

More relevant, increasing trade liberalization can reduce global emissions only in the case when both areas attribute a social content to green consumption. By contrast, trade liberalization is always environment detrimental when relative preferences are observed in the poorer country.

2. Related Literature

Our paper locates in the existing literature that analyses conspicuous consumption and the corresponding role played by the social content of preferences. More specifically, our modelling strategy is inspired by the *empirical* literature on conspicuous green consumption and social status. Sexton and Sexton (2014) test for the presence of a conspicuous conservation effect in vehicle purchase decisions and estimate the willingness to pay for the “green halo” generated by signaling green type. They find that “green” cars are more valuable in communities with a strong green ethos than in communities with greater heterogeneity in attitudes toward the environment. Welsch and Kühling (2009) using a panel data for Germany find evidence that the green consumption of reference persons plays a significant role on whether individuals install residential solar energy equipment or subscribe to green-electricity programs. It seems indeed that when buying environmentally-friendly products agents feel to set a good example for their peers and that their family and friends would appreciate back if they used environmentally-friendly product.⁶ Alpizar and Gsottbauer (2015) present a framed field experiment on the role of reputation as a driver of a recycling behaviour. They find that reputation plays a role in promoting green efforts. Interestingly, the willingness to avoid shame generated by a bad behaviour is stronger than the one to acquire gratitude or good reputation.

We believe that this phenomenon can be modelled in a

(footnote continued)

own consumption in relation to the consumption of the others. Specific relative preferences have been considered for example by Akerlof (1997). In his paper, the satisfaction of a consumer increases with the difference between the personal status and others' status. Alexopoulos and Sapp (2006) and Riechmann (2006) analyse relative preferences from the point of view of firms. They are also labeled ‘other-regarding preferences’.

⁶ Torgler and García-Valiñas (2007) in a different but close perspective stress the role of trust and membership in promoting pro-environmental behaviour. See also Van den Bergh (2008) for an empirical analysis on potential psychological determinants of a pro-environmental behaviour.

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