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PIONEERS, IMITATORS AND SOCIAL WELFARE
Leonardo Becchetti, Giorgio Federico, Nazaria Solferino

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Leonardo Becchetti

Università di Roma, Tor Vergata

Giorgio Federico

Università di Roma, Tor Vergata

Nazaria Solferino

Università di Roma, Tor Vergata

Informazioni :

Facoltà di Economia di Forlì - Corso di Laurea in Economia delle Imprese Cooperative e delle ONP

Tel. 0543-374620 – Fax 0543-374618 e-mail: nonprofit@spfo.unibo.it website: www.ecofo.unibo.it

The game of social responsibility: pioneers, imitators and social welfare¹

Leonardo Becchetti

Università Tor Vergata, Roma, Facoltà di Economia, Dipartimento di Economia e Istituzioni, Via di Tor Vergata snc, 00133 Roma. E-Mail : Becchetti@economia.uniroma2.it

Giorgio Federico

Università Tor Vergata, Roma, Facoltà di Economia, Dipartimento di Economia e Istituzioni, Via di Tor Vergata snc, 00133 Roma.

Nazaria Solferino

Università Tor Vergata, Roma, Facoltà di Economia, Dipartimento di Economia e Istituzioni, Via di Tor Vergata snc, 00133 Roma.

In this paper we outline a model of horizontal product differentiation where two duopolists - a profit maximising producer (PMP) and a "socially responsible" "fair trader" (FT) producer - compete over prices and (costly) "socially and environmentally responsible" features of their products. We analyse the optimal PMP reaction in price and location on the "social responsibility segment" under the assumption that

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consumers have quadratic costs in buying a product which is below their own ethical standard.

We show that, when consumers' perceived costs of ethical distance are high enough, PMP's partial ethical imitation is part of his optimal reaction under different theoretical frameworks.

We finally evaluate deviations of PMP and FT price-location choices from social optimum, finding that - even though FT's entry represents a Pareto improvement for consumers in the North - strategic complementarity between prices and ethical location leads to prices and location which are above domestic (but not necessarily international) social optimum in all the considered games.

Keywords: horizontal differentiation, social responsibility, social welfare

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1. Introduction

Why companies such as Vodafone suddenly announce that they will distribute "socially responsible (fair trade)² coffee" from their office vending machines all over the world ?

What pushes large transnationals such as Kraft, Nestlè or Starbucks to introduce new lines of socially responsible (fair trade) products ? Why they voluntarily reduce their profit margins on these products to increase their social and environmental sustainability by paying more to subcontractors or commodity producers and introducing higher environmental standards ? ³

² The definition of fair trade product considered in this paper (for additional details see what follows in the introduction), is quite different from the traditional meaning of "Fair trade" in the field of industrial organization. From the 1930s onward (although there are antecedents going back to 1900), in both the US and the UK, the term refers to schemes of industry trade association to regulate competition among members, usually by requiring that prices be posted in advance and that no transactions take place except at posted prices. During the Great Depression in the U.S., such schemes were part of the National Recovery Act. In the more recent literature fair trade indicates "arguments that relate to certain conditions under which trade, and the production of traded goods, should minimally take place" (Maseland - Vaal, 2002). In this framework fair trade generally refers to the absence of duties, controls and dumping practices in international trade. For a similar use of the term see also Mendoza - Bahadur, 2002; Bhagwati, 1996; Stiglitz, 2002; Suranovic, 2002). The fair trade products we refer to in this paper are on the contrary food and artisan products which obtain the fair trade label since their production process follow some criteria for social and environmental sustainability established by the movement of fair trade importer and retailers.

³ One of the world's biggest players in the coffee market, the US consumer good company Procter & Gamble, announced it would begin offering Fair Trade certified coffee through one of its specialty brands. Following Procter & Gamble's decision to start selling a Fair Trade coffee, also Kraft Foods, another coffee giant, committed itself to purchasing sustainably grown coffee. Furthermore, Kraft will buy 5m pounds of Rainforest Alliance certified coffee in the first year, according to an agreement between Kraft Foods and the Rainforest Alliance (EFTA Advocacy Newsletter n° 9). In Italy, the Fair Trade certification brand TransFair Italy certifies specific fair trade products sold by

The aim of this paper is to provide a rationale for these "anomalies" which apparently contradict the profit maximizing goals of corporations, unless we explicitly take into account and model social responsibility as a new competitive dimension.

Our story starts from the observation that the compression of distances led by innovations in the fields of electronics and telecommunication⁴ has increased consumers perception of the interdependence among countries and made more urgent to solve problems related to the "markets failures" and the insufficient provision of global public goods.

On our opinion this is the framework in which competition for social responsibility (SR) is born. The process may be divided in two stages. In the first, the growing sensitiveness of the public opinion toward social responsibility,⁵ generates a series of

consumers good distribution companies and multinationals such as Coop, Carrefour, Sma, Pam, Gs, Conad (http://www.macfrut.com/ita/conv_2003/relazioni/162benvenuti_f2.pdf).

⁴ Some interesting (non strictly economic) definitions of these phenomena or globalisation are "death of distance" (Cairncross, 1997), "intensification of social relationships linking distant places in the world so that what happens locally is affected by what happens thousands of kilometers away" Giddens (2000), "intensification of the conscience of the world as a whole" (Robertson, 1992). It is also well known that the process of global integration is not new, was intense at the beginning of the 20th century, experienced a sudden inversion between the two world wars and had a sudden acceleration in the last thirty years (Debenedictis-Helg, 2002).

⁵ The increased sensitivity is revealed by the growth of socially responsible consumption. In a recent survey the "2003 Corporate social responsibility monitor" (downloadable at <http://www.bsdglobal.com/issues/sr.asp>) finds that the amount of consumers looking at social responsibility in their choices jumped from 36 percent in 1999 to 62 percent in 2001 in Europe. In February 2004, a research undertaken by the market research company TNS Emnid in Germany on a representative sample of the population finds that 2.9% of those interviewed buy Fair Trade products regularly, 19% rarely, and 6% almost never. 35% of respondents said they support the idea, but do not buy (www.fairtrade.net/sites/aboutflo/aboutflo). In a parallel UK survey, Bird and Hughes (1997) classify consumers as ethical (23 percent), semi-ethical (56 percent) and selfish (17 percent). 18

"bottom-up" welfare initiatives, usually classified under the general definition of (zero profit) socially responsible (or socially concerned) saving and consumption. This phenomenon gives rise to a first generation of pioneers selling SR products. These pioneers conquer positive market shares and make traditional producers aware of the existence of consumers choosing not only on the ground of price, quality and "ads induced" status symbols, but also on the basis of the social or environmental values incorporated in the products. In a second step, pioneers' entry triggers traditional producers' competitive reaction, based not only on prices, but also on partial imitation in the field of social responsibility.

To illustrate this process the paper focuses on a special group of socially responsible products: the so called *fair trade* products.

Fair trade is a product chain created by zero profit⁶ importers, distributors and retailers of food and textile products which have been partially or wholly manufactured by poor rural communities in developing countries under specific social and environmental criteria. To obtain the "fair trade" label products need to comply with a series of criteria, defined by the Fair Trade Labeling Organisation (FLO)⁷: i) paying a fair wage in the local context; ii) offering employees opportunities for advancement

percent of the surveyed consumers declares to be willing to pay a premium for SR products. For a survey on the theoretical literature on social preferences see (Fehr-Falk, 2002).

⁶ Fair trade associations usually have zero or negligible economic profits. This condition is often statutory since most of them take the form of cooperatives. For simplicity we assume here that they are zero profit. The assumption of small positive profits would not change the substance of our model based on the assumption that profit maximisation is not the goal of FT importers. In the year 2001 97 importers and 2741 specialised retailers followed these rules and were part of the FT movement in the EU. In 2000, in the U.S. and Canada, 600 outlets wholesaled Fair Trade products, while at least 2575 offered retail. In 2001, at least 7000 provided retail.

⁷ Further information on Fair Trade may be found, among others, on the following websites www.eftafairtrade.org (European Fair Trade Association) and www.fairtradefederation.com (Fair Trade Federation).

(including investment in local public goods); iii) providing equal employment opportunities for all people, particularly the most disadvantaged; iv) engaging in environmentally sustainable practices; v) being open to public accountability; vi) building long-term trade relationships; vii) providing healthy and safe working conditions within the local context; viii) providing technical and financial assistance (price stabilization insurance services and anticipated financing arrangements which reduce financial constraints) to producers whenever possible.

Most of these criteria may be seen as bottom-up solutions to specific market failures and have been shown to be preferable in terms of welfare effects to the purchase of a good on the traditional market coupled with a charity donation (Becchetti-Solferino, 2003).⁸ The fair wage/price criterion states that, in the price paid to producers in the South, a much higher share of the value of the product must be transferred to them than what is usually the case. If we assume, as it often is, that raw or intermediate material producers in the South have very low

⁸ Intuitively, there are at least five reasons for such superiority: i) only the fair trade purchase generates the positive indirect effects on social responsibility of traditional producers under the conditions explained in this paper; ii) fair trade channels provide learning through export, price stabilization services and promote inclusion of unskilled but potentially productive workers (producers) in international labour (product) markets; iii) charity does not necessarily reward more productive people; iv) fair trade, differently from charity, provides a minimum wage measure needed to solve market failures in case of monopsonistic labour markets (or may reduce intermediary rents in local transportation market); v) fair trade contributes with anticipated financing to reduce uncollateralised producers' credit constraints together with their dependence from monopolistic local moneylenders; vi) the FT bottom-up mechanism may be more efficient than government subsidies in targeting the poor; vii) joining consumption and social transfer reduces transaction costs of aid to the poor with respect to the traditional tax financed government aid scheme. More specifically, points iv) and v) show how FT improves market competitiveness (in credit and labour markets) while charity does not. Finally, when FT consumer price is not substantially higher than the traditional product price, the FT choice results to be much cheaper than the traditional purchase plus charity donation alternative.

bargaining power and are in a quasi-monopsonistic market,⁹ the fair trade price can be related to the market price which would prevail if the two counterparts would have equal bargaining power. In this respect, it may become a non governmental minimum wage provided by private citizens in developed countries.

Adriani and Becchetti (2005) also show that using prices as a policy instrument to transfer resources to the South cannot be considered a market distortion but a market creation since fair traders open in the North a new market in which "contingent

⁹ Support for the existence of monopsonistic labour markets for unskilled workers, not just in LDCs but also in developed countries, is provided by several authors (Manning, 2003; Card and Krueger, 2000). Manning (2003) argues that labour markets may be thin not just in presence of a single employer, but also when employers are few and collude or in the presence of geographical distance and labour differentiation. Evidence of employers' excess market power in LDCs countries is provided by Terrell and El Hamidi (2001) finding that minimum wages reduce inequality and increase employment on a large sample of workers in Costa Rica and by several paper investigating the effects of minimum wage policies in Brazil (Camargo, 1984; Gonzaga et al., 1999; Carneiro, 2002; Lemos, 2004). Furthermore, we argue that, by just looking at published empirical papers, evidence of monopsonistic labour markets is underestimated because of a selection bias. The more the labour market is informal and characterized by exploitation, the more difficult it is that it can be object of a systematic empirical analysis. To quote evidence from reliable reports not object of systematic empirical research, the US state department signals that in 2003 there were about 109 000 children working in dangerous conditions in Ivory Coast, the source of 4 percent of the world's cocoa. Starbucks financed an independent study of working conditions in the Guatemala coffee sector in 2002. The study was undertaken by the Commission for the Verification of Codes of Conduct (COVERCO) and released in February 2000, reporting extensive violation of labor law in the areas of wages, health care, and hours. COVERCO conducted another report on living and working conditions on Guatemalan coffee plantations in March 2003. However, it should be emphasized that the labour market story is just an example of a more widespread phenomenon. We could think of alternative examples in which self-employed farmers sell their crops to a single exporter. For instance, Conley and Udry (2003), in describing the functioning of the pineapple production in Ghana, report that farmers plant and grow their crops, while an exporter is usually in charge of harvesting and shipping the fruits to Europe.

ethical" products (combining physical products and values) are sold.

Fair trade products are beginning to achieve non negligible market shares.¹⁰ They captured around 2% of the ground coffee market in the EU and about 15% of the banana market in Switzerland in the year 2000¹¹.

Within the above described framework the model outlined in this paper aims to analyse structure and consequences of the "social responsibility game". The paper is divided into six sections (including introduction and conclusions). In the second section we shortly describe the basic features of the model, a horizontal differentiation duopoly, in which physical distance is reinterpreted as "social responsibility" distance.

In the third section we analyse the sequential entry version of the model in which a profit maximising incumbent reacts to the entry of a socially responsible player. We analyse equilibria under the two different cases of incumbent fixed ethical location and incumbent joint reaction in prices and ethical location, outlining conditions under which the latter decides to partially imitate the entrant. In the fourth section we describe solutions of a simultaneous game in prices and ethical location played by a profit maximising and a zero profit socially responsible player. In the fifth section we compare equilibria of the previously mentioned versions of the model with the socially optimal price and locations fixed by a social planner which maximises welfare of consumers with heterogeneous preferences on social responsibility.

¹⁰ There is a growing interest on Fair Trade also in the institutions. In the 1999 the European Commission issued a document about Fair Trade (29.11.1999 COM(1999) 619; in its introduction is underlined the potential goods effects of Fair Trade to reduce inequalities between the richest and poorest countries and in promoting a sustainable development. Two years later, in the 2001, the European Commission issued also a "Green Book" COM(2001) 366 to promote firms' social responsibility in a european framework, and a relevant part of this book just deals with the Fair Trade experience.

¹¹ The source is the EFTA Yearbook 2001.

2. The basic assumptions of the model before FT entry

Most of the hypotheses in the model which follows are standard assumptions in the horizontal differentiation literature. Some of them are original and are given by the specific nature of ethical competition. We outline model features by defining producers, market space and consumers.

The production side

The monopolist profit maximiser

The monopolist transforms raw materials received from unskilled producers in the South paid with a monopsony wage (w). He maximizes profits by fixing a price P_A for his product which is sold to consumers in the North.

The Fair Trader

We assume in this benchmark model that there are no "free lunches" in ethical responsibility and we abstract from asymmetric information on the quality of FT product. The Fair trader's criteria of action are those described in the introduction. We "stylise" these features by assuming that the entrant sells his product at zero profit and transfers an exogenously fixed "free margin" \bar{s} ¹² (after paying the monopsony wage) which is needed to comply with all the Fair Trade criteria (provision of local public goods, premium on the monopsony wage, creation of a long term

¹² We take the fair trader as an example of socially responsible producer and identify social responsibility in the resources transferred to producers in the South. Our model may be generalised and applied also to "environmentally concerned" producers by assuming that the adoption of environmentally responsible production processes increases costs exactly as in our fair trader's example.

partnership through the provision of export services, etc.).¹³ The zero profit condition of the entrant is therefore: $P_B = w(1 + \bar{s})$.

The market space

The entry of the FT into the market has the effect of creating a new market space along an "ethical" segment which we assume to have unit length for simplicity and without lack of generality (Figure 1). Location on the left extreme corresponds to the choice of no transfer to South producers ($s=0$) in addition to the monopsony wage, while location on the right extreme corresponds to the choice of a transfer exogenously fixed when the Fair Trade criteria mentioned in the introduction are fully complied ($s=\bar{s}=1$). Within these two extreme choices we observe that both producers dispose of a set of strategies in social responsibility - $a\bar{s}$ where $a \in [0,1]$ - allowing them to locate in any point of the segment if they want.

¹³ Fair Trade criteria of action imply a series of initiatives in support of producers in the South (prefinancing, provision of local public goods, a premium as a minimum wage measure against monopsonistic labour markets, export services, price stabilisation mechanisms, training and counselling etc.). On the premise that these initiatives are not costless, we stylise all of them in the model into an additional cost component (the transfer \bar{s}) that the FT send to the producer in the South. Hence, the transfer \bar{s} is not related to the minimum wage only and the reason of its existence does not disappear, even in case of end of the monopsony on the labour markets.

Second, the FT dimension with respect to world markets and the multiple directions of its action make that the decision of a single FT to transfer \bar{s} does not reduce its need in the future for further producers. A very effective and concentrated action in one area may reduce the monopsony problem, but it does not eliminate the other reasons of the transfer. Hence, it is not unreasonable to consider that the individual FT decision to send \bar{s} does not eliminate the aggregate problem of the inclusion of small uncollateralized producers with low bargaining power in the South. These considerations led us to focus on the interaction between FT and incumbent without modelling the effects of the s transfer in the South.

The demand side

Consumers

Consumers have inelastic, unit demands and heterogeneous preferences on social responsibility. Therefore they are uniformly distributed across the line segment $[0,1]$ (a standard feature in horizontal differentiation models).¹⁴

A different position in the interval for consumers does not imply differences in physical distance or in product characteristics, but in the psychological perception of the ethical value of the good.¹⁵ The consideration of ethical instead of physical distance makes a difference in at least two ways. First, consistently with our concept of ethical distance, the cost of moving along the line segment is positive only for those going from a more ethical to a less ethical point. As a consequence, by considering the extreme right of the segment as the most ethical position, consumers move without costs to the right, while they incur in costs proportional to the "ethical" distance anytime they move to the left.¹⁶ This explains why costs are increasing in the distance between consumers and PMP location for consumers buying from the PMP in Figure 1.

We assume that consumers utilities are decreasing in product price and also in the distance between consumer's ethical stance and the

¹⁴ Import duties, value added taxes and transportation costs are obviously part of total costs of importers of agricultural products from the South. In this paper, though, they do not affect our results and therefore are omitted from the model for simplicity.

¹⁵ In this model we abstract from considerations of asymmetric information and divergences between consumers' and sellers' perception of the ethical value of the good by assuming that they coincide. To reduce distance from reality it may be interesting, in an extension of this model, to analyse market equilibria under asymmetric information and considering the role of ethical labelling.

¹⁶ The rationale for these assumptions is that moving to the left implies choosing a product below one's own ethical standards (which is psychologically costly), while moving to the right implies choosing a product above one's own ethical standards (which may be even considered "too much" and therefore we assume it does not give any psychological cost to the buyer).

ethical value incorporated in the purchased product. The psychological cost of buying a product which is below one's own ethical standards is t times the ethical distance so that consumer's welfare is

$$Wc = R_p - P_i - t(x-a)^2 \text{ if } x-a \geq 0^{17} \text{ or } Wc = R_p - P_i \text{ if } x-a < 0$$

where (P_i) is the price of product sold by the i -th seller, (R_p) is the common consumers' reservation price and x denotes generic consumer location.

After the specification of the FT's behaviour and of consumer's position on the segment the cost of ethical distance has a clear monetary counterpart. When the producer is located at the right of the consumer this cost represents the distance in monetary terms between the transfer, which is considered fair by the consumer (indicated by his location on the segment) and the transfer provided by the producer (indicated by producer's location on the segment). The coefficient t maps this objective measure into consumers preferences.

The ethical features of the model

Given the model characteristics it is clear that the SR feature coincides with the application of the set of specific FT criteria along the value chain. These criteria promote a series of actions to foster inclusion of South producers with low bargaining power in international markets. Hence, SR is related to what happens in the productive process and in the overall value chain behind the product more than to the intrinsic features of the product sold.

¹⁷ The way we design consumers preferences is consistent with empirical evidence and consumers surveys in which values are shown to be a determinant of choices together with prices (see footnote 5). From a theoretical point of view this point has been remarkably analysed, among others, by Sen (1993) showing that people choose also on the basis of their values and, for this reason, they do not always choose what they would strictly prefer on the basis of prices. Lexicographic preferences are ruled out here but may be considered a limit case of our model when costs of ethical distance go to infinity.

3.1 The effects of the entry of the socially responsible producer when PMP's location is fixed

In this section we assume that the profit maximising producer is a monopolistic incumbent set at the extreme of the ethical segment (he chooses the strategy $a=0$).¹⁸ An "orthodox" Fair Trader fully complies with exogenous FT criteria, enters the market and places himself at $\bar{s} = 1$.¹⁹ The PMP ethical location is fixed and its reaction can be only in prices.

As explained in section 2 the zero profit condition of the entrant is: $P_B = w(1 + \bar{s})$.

After the FT's entry the consumer's indifference condition is equal to $P_A + t(x-a)^2 = P_B$, if $x-a \geq 0$, and $P_A = P_B$, if $x-a < 0$. Hence, the condition for a nonzero market share for the FT is, for some x , $t(x-a)^2 > P_B - P_A$, and the resulting incumbent market share

$x^* = \sqrt{\frac{P_B - P_A}{t}} + a$. This implies that the incumbent market share

increases (decreases) less than proportionally in the price gap (in the costs of ethical distance (t) perceived by consumers).

It is possible to show in this first simple example that the incumbent finds it optimal to reduce his price after the fair trader entry when his location is fixed. after the fair trader entry the incumbent maximises

¹⁸ The assumption will be removed in section 4 of the paper. It is reasonable if we assume that the PMP is initially uninformed about consumers ethical preferences (or he has to pay a sunk cost higher than future expected benefits from being more ethical to verify whether these consumers exist) and FT entry with its market share reveals the existence of these consumers to him.

¹⁹ The case of FTs with non endogenous location in the SR segment is consistent with their international criteria which fix, in the market of agricultural commodities such as coffee, cocoa, etc. a standard contingent premium on market prices adopted by all local organisations. In cocoa and coffee markets for the last 20 years the premium reached a maximum of twice the market price in market downturns, and a minimum of 5% in market upturns (EFTA 2003 Fair Trade Report).

$$Max_{P_A} \pi = [P_A - w] \left[\sqrt{\frac{w(1+\bar{s}) - P_A}{t}} \right] \quad (1).$$

The first order condition yields

$$P_A^* = w \left(1 + \frac{2\bar{s}}{3} \right) \quad (2)$$

The incumbent price is, as expected, increasing in the fair trader transfer to the South. His optimal price is between his zero profit price and the zero profit fair trader price. This means that the incumbent divides the distance between these two prices in two parts. One of them (the largest) is his margin and the other (the smallest) is the extent of the price cut. The last is due to the new element of competition introduced by the FT's entry. In this first simple case the incumbent cannot react on location. He therefore uses prices to compete with the entrant and to defend his market share.

Conditions for the existence of a duopoly reconsidered given optimal PMP reaction

Consider that, with quadratic costs of ethical distance, PMP market share is $\sqrt{\frac{sw}{3t}}$ where $\sqrt{\frac{sw}{3t}} \geq 1$ for $t \leq \bar{s}w/3$. Hence, with FT exogenous location ($\bar{s}=1$) and $t < 1/3$ conditions for FT entry do not materialise and the PMP maintains all the market.²⁰

3.2 Joint price and ethical location choice of the incumbent.

In this section we remove the hypothesis of PMP fixed location and analyse how the incumbent reacts to the FT's entry, by choosing both optimal price and location along the SR segment.

Given the absence of asymmetric information in the model, there are no "free lunches" in social responsibility. Hence, in order to move right in the ethical location, the incumbent must transfer a positive sum to producers in the South in the same way as the fair

trader does. Since $a \in [0,1]$ we argue that $(a\bar{s})$ is the total incumbent transfer, where (\bar{s}) is the fair trader transfer and (a) the incumbent's location choice. This parametric choice ensures that, if the incumbent chooses an ethical location identical to that of the fair trader ($a = 1$), he transfers exactly the same amount to the South.

This hypothesis makes ethical location and prices two non independent variables. This difference adds to the two already mentioned differences between ethical and traditional horizontal differentiation: i) distance costs apply only in one direction (movements to the right in the ethical segment) and ii) one of the duopolists (the fair trader) does not maximize profits. Results from the joint maximization problem of the PMP lead us to formulate the following proposition

Proposition 1. If the PMP jointly chooses price and ethical location after the socially responsible entry, the model switches from an equilibrium with maximum ethical differentiation with no imitation to an equilibrium with partial ethical imitation when consumers marginal costs of ethical distance are higher enough than producer costs of ethical imitation

Proof. In his simultaneous price-location choice the incumbent maximizes:

$$\underset{(P_A, a)}{\text{Max}} \pi = [P_A - w(1 + a\bar{s})] \left[\sqrt{\frac{P_B - P_A}{t}} + a \right] \quad (3) \quad \text{under the nonnegative location}$$

constraint $a \geq 0$.²¹ Solving the first order conditions we obtain the following solutions for the optimal incumbent's price²²

²⁰ With w conveniently normalised to 1 this implies $t > 1/3$ for FT existence and $t > 3/4$ for PMP imitation.

²¹ Consider also that: i) to rule out positive values generated by the product of negative margins and negative market shares we only look at solutions with positive mark-up constraint and that ii) the PMP price cannot be higher than the FT price for real and positive values of PMP's market shares.

²² The apparently counterintuitive result of the positive relationship between PMP price and consumers costs of ethical

$$P_A^* = P_B - \frac{(\bar{sw})^2}{4t} \quad (4) \text{ and location } a = \frac{1}{2} - \frac{3\bar{sw}}{8t} \quad (5) \text{ for } t > (3\bar{sw}/4), \text{ while,}$$

when $t < (3\bar{sw}/4)$, $a^* = 0$ and P_A^* is that calculated in (2) as optimal price in the problem with exogenous PMP location. Hence $t = 3\bar{sw}/4$ is the threshold of consumers costs of ethical distance which triggers PMP imitation. ■

Note that higher consumers sensitiveness toward ethical responsibility raises gains from ethical imitation and therefore leads to higher PMP optimal price and imitation in equilibrium. Furthermore, both optimal price and location are increasing in consumers costs of ethical distance while the effect of FT location on PMP optimal price is ambiguous. On the one side, more ethical FT location raises P_B allowing the PMP to compete with higher prices. On the other side, it raises costs of ethical imitation, thereby reducing one source of PMP price increase.

4.1 The simultaneous game with the "altruistic" FT

The first rudimentary model of section 3 starts from the realistic assumption that Fair traders only recently appeared on product markets and incumbent profit maximisers reacted to their entry. In this section we investigate the interaction between profit maximisers and fair traders (and conditions for PMP imitation) into the broader context of simultaneous games by demonstrating the following proposition.

Proposition 2: the simultaneous game, in which the FT chooses location so to maximize transfers of both producers and the PMP chooses price and location, yields partial PMP imitation, with FT located in an interior point of the unit ethical space.

distance depends on the positive relationship between optimal PMP price and ethical imitation which is evident from the PMP price

Proof: In the simultaneous game the PMP and the FT jointly maximise, respectively, profits and total transfers to the South (i.e. the sum of the amount transferred to Southern producers both from PMP and from FT), under $s^* \leq 1$.

The three FOCs are

$$\frac{\partial \pi}{\partial P_A} = 2 \left(\frac{P_B - P_A}{t} \right) + 2a \sqrt{\frac{P_B - P_A}{t}} - \left[\frac{P_A - w(1+as)}{t} \right] = 0 \quad (6)$$

$$\frac{\partial \pi}{\partial a} = -sw \left[\sqrt{\frac{P_B - P_A}{t}} + a \right] + [P_A - w(1+as)] = 0 \quad (7)$$

$$\frac{\partial T}{\partial s} = 2(1-a) \sqrt{\frac{P_B - P_A}{t}} - 2 \left(\frac{P_B - P_A}{t} \right) - \frac{sw}{t} + \frac{aw}{t} = 0 \quad (8)$$

where (6) and (7) solve the PMP and (8) the FT maximisation problem formulated as $Max T = s[1-x^*] + asx^*$.

From the first two equations of the system we get $x^* = \sqrt{\frac{P_B - P_A}{t}} = \frac{sw}{2t}$

$$(9), \quad P_A^* = P_B - \frac{(sw)^2}{4t} \quad (10) \quad \text{and} \quad a^* = \frac{1}{2} - \frac{3sw}{8t} \quad (11).$$

By replacing these reaction functions into the third equation of the system, we get,

$$\text{after some manipulations: } s^* = \frac{-(3w+4t) + \sqrt{(3w+4t)^2 + 16tw}}{2w} \quad (12) \quad \text{which is}$$

lower than one and therefore within the unit SR segment.²³ By some algebraic transformations it is possible to show that, under (12), the condition $t > 3sw/4$, under which ethical imitation is convenient for the PMP, is always respected.

Therefore the FT chooses his location in an internal point s^* inside the unit segment and, given that $t > 3s^*w/4$ always holds, a^*

reaction function ($P_A^*(a^*)$) derived from first order conditions.

²³ By normalizing $w=1$ with no loss of generality, we obtain a range of $s^* \in [.11, .76]$ given the reasonable range of $t \in [.1, 3]$ for consumers' costs of ethical distance. More generally, with $w=1$, $\lim_{t \rightarrow \infty} s^* = 1$.

and P_A^* , obtained by replacing s^* in (10) and (11), correspond to the PMP's optimal price and location in the simultaneous game. ■

An important feature of this solution is that total transfers are increasing in PMP ethical imitation. Since total transfers are the goal of the FT he will find convenient to elicit PMP imitation and, for this reason, he will find it optimal to locate himself more to the left in order to reduce PMP's costs of imitation.

4.2 The simultaneous game with the "selfish" FT

Notice that this last result may change if the FT, is less "altruistic" and chooses the best location by maximising *his own transfers* and not total market transfers. In such case we may observe a *trade-off between radicalism and effectiveness of social responsibility* evidenced by the following proposition.

Proposition 3. The fair trader optimal position on the SR segment in the simultaneous game with the PMP is more "socially responsible" when he maximizes his own and not total market transfers to the South. In this case, and under given parametric conditions, such position may reduce the likelihood of PMP imitation and total SR transfers to the South.

Proof: the new maximand of the "selfish" FT is $MaxT = s[1-x^*]$. In

that case the third equation of the system (6-8) of FOCs becomes

$$\frac{\partial T}{\partial s} = 2(1-a)\sqrt{\frac{P_B - P_A}{t}} - 2\left(\frac{P_B - P_A}{t}\right) - \frac{sw}{t} = 0 \quad (8')$$

and, by replacing PMP price and location reaction functions (respectively 10 and 11) into it,

$$\text{we get } 2\left(1 - \frac{1}{2} + \frac{3sw}{8t}\right)\frac{sw}{2t} - 2\left(\frac{sw}{2t}\right)^2 - \frac{sw}{t} = 1 + \frac{sw}{4t} > 0 \quad (13)$$

which is always positive. This implies that the FT will choose the highest s compatible with the constraint $s \leq 1$. Therefore his optimal location may be only at the right extreme of the SR unit segment ($s=1$).

At the same time, for $t > 3/4$, (10) and (11) still express the optimal PMP's price and location choices.

On the contrary, if $t < 3/4$, PMP chooses $a=0$ as in the fixed location case. Under this circumstance the FT maximisation problem becomes

$$4\left(\frac{sw}{3t}\right) = 9\left(\frac{sw}{3t}\right)^2 \Rightarrow s^{**} = \frac{4t}{3w} \quad (14).$$

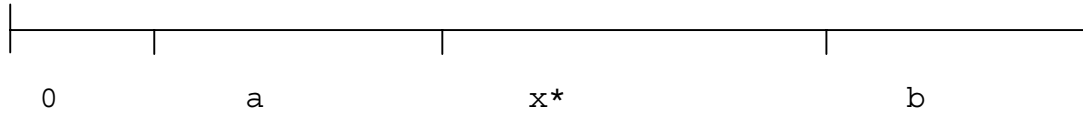
As a consequence, we fall in the case in which $t = 3sw/4$ so that $a=0$ is still the optimal PMP location choice. Since s^* (the optimal location of the "altruistic" FT) is lower than $\bar{s}=1$ we may fall into cases in which $3s^*w/4 < t < 3w/4$ and therefore the PMP would imitate with altruistic but not with selfish FT. Hence the "selfish attitude of the FT reduces the likelihood of PMP imitation and total transfers to the South under relevant parameter ranges."²⁴ ■

The difference between FT locations when he maximises total transfers or his own transfers clearly identifies a trade-off between radicalism and effectiveness of social responsibility. If the FT goal is to maximise his own transfers he will be more radical in social responsibility, while, if the goal is to maximise total transfers to the South, he will be more pragmatic and reduce his own activity in order to elicit more imitation from the PMP.

5. Social planner

We are now interested in comparing results from the previous versions of the model with socially optimal prices and locations of the two players. Consider a social planner that maximises consumers welfare by fixing a zero profit price - $P_i = w(1+s_i)$ - for both players. Under this condition he chooses PMP and FT locations

(respectively a and b) which maximise social welfare on the ethical segment which is drawn below²⁵



1

By remembering that, in the ethical segment, only consumers moving from the right to the left have costs of ethical distance, the social planner problem is to find optimal locations a and b maximising consumers welfare

$$MaxWC = \int_0^a [Rp - P_A] dx + \int_a^{x^*} [Rp - P_A - t(x-a)^2] dx + \int_{x^*}^b [Rp - P_B] dx + \int_b^1 [Rp - P_B - t(x-b)^2] dx$$

(15)

or, equivalently, minimising consumers total costs (TC):

$$MinTC = \int_0^a [P_A] dx + \int_a^{x^*} [P_A + t(x-a)^2] dx + \int_{x^*}^b [P_B] dx + \int_b^1 [P_B + t(x-b)^2] dx$$

(16)

To solve this problem consider that when, for simplicity, we set $w=1$, the indifference condition yields

$$P_A + t(x-a)^2 = P_B \Rightarrow 1+a+t(x-a)^2 = 1+b$$

(17)

implying the following market share for the player located more to the left.

$$x^* = \sqrt{\frac{b-a}{t}} + a$$

(18)

By replacing (18) in (16) we get:

²⁴ More precisely, by normalizing $w=1$ we find that total market transfers to the South are higher in the simultaneous game with altruistic FT when $t \in [.3, .8]$

²⁵ We conventionally continue to consider a and b, respectively as the PMP and the FT location even though, for the social planner fixing for both a zero profit rule, the distinction between the two vanishes.

$$TC = 1 + b - \left(\sqrt{\frac{b-a}{t}} + a \right) (b-a) + tx^* \left[\frac{x^{*2}}{3} + a^2 - a \sqrt{\frac{b-a}{t}} - a^2 \right] + t \left[\frac{1}{3} + b^2 - b - \frac{b^3}{3} + b^3 - b^3 \right] -$$

$$-t \left[\frac{a^3}{3} + a^3 - a^3 \right]$$

(19)

)

The solution is analytically cumbersome and it may be easier to solve it by considering optimal location under reasonable parameters ranges.

We start by considering that $x^* \in [0,1]$, normalizing $w=1$ and evaluating a and b for different values of consumers costs of ethical distance (t). Results of optimal prices and locations in different games compared with social optimum are presented in Figures 3 and 4.

The most important conclusions that can be drawn are the following.

First, for low levels of t the FT always chooses a location within the unit segment and therefore inferior to its exogenous location (difference between $Ex(a)$ and $SIMI(a)$) given that, to maximize transfers to the South, it is optimal to be less socially responsible in order to capture a higher market share.

Second, PMP imitation starts at the lowest levels of consumers sensitivity to ethical distance in the simultaneous game in which the FT is altruistic (maximizes total market transfers) (the difference between $SIM(a)$ and $SIMs(a)$ is always positive for any level of t in Figure 2). The joint (price-location) choice of the PMP with exogenous FT location is an intermediate case (for any level of t $SIM(a) > Ex(a) > SIMs(a)$), while the lowest and latest PMP reaction in ethical location ($SIMs(a)$) is in the simultaneous game in which the FT maximizes his own transfers.

Third, PMP growth in ethical location is less than proportional in the increment of consumers costs of ethical distance, consistently with the limited capacity of conquering additional market shares

in a model in which consumers sensitivity is quadratic and not linear.

Fourth, PMP and FT location tend to diverge in the simultaneous game in which the FT is altruistic, while they tend to converge in all other cases since the FT rapidly moves to the extreme of the segment, while the PMP increases imitation in proportion to consumers perceived costs of ethical distance (Figure 2).

Fifth, consistently with proposition 3 we observe that the altruistic FT is less radical than the FT which maximizes his own transfers (the difference between $SIMs(b)$ and $SIM(b)$ is positive for any t) since, by being more radical, he can trigger more imitation and imitation is in his own target when he maximizes total market transfers. Hence, in our model radicalism is therefore a consequence of "non altruism", or of maximizing one's own transfers and not total market transfers.

Sixth, *social planner optimal locations are always lower than privately optimal locations* ($SP(a)$ is below $SIM(a)$, $SIMs(a)$ and $Ex(a)$ and $SP(b)$ is below $SIM(b)$, $SIMs(b)$ and $Ex(b)$ for any level of t). This is because social planner is not concerned with market shares and therefore he does not use ethical location for strategic concerns. On other terms, strategic complementarity between prices and ethical location is such that higher prices, justified by more ethical location, may help and not prevent the conquest of additional market shares. The private equilibrium therefore leads to excess ethical location and excess prices with respect to the socially optimal solution (Figure 3).

6. Conclusions

In recent times we assisted to an outsurge of (costly) initiatives in the field of social responsibility of large transnational companies with a behaviour which is in apparent contradiction with the conventionally assumed profit maximising strategy.

In this paper we explain why this contradiction does not exist when such behaviour is correctly interpreted as the optimal reaction to the entry of a zero profit socially responsible producer which conquers market shares by selling to consumers with stronger preferences for social responsibility.

Our results show that, under reasonable parametric conditions, the optimal reaction of the monopolist incumbent PMP to the entry of socially responsible producers is ethical imitation. The extent of ethical imitation depends on its cost, on consumers sensitiveness to social responsibility and on the structure (simultaneous, sequential) of the social responsibility game.

In the final section of the paper we compare privately optimal prices and locations of the two players with those of a social planner maximising welfare of consumers in the North. Our results show, somewhat surprisingly, that all equilibria in the game exhibit too much social responsibility from a domestic welfare perspective. Such result is crucially affected by our assumption of a duopolistic market and by the complementarity between prices and ethical location.

In evaluating this result we must not forget though that the FT represents by itself a Pareto improvement for consumers in the South, since it is equivalent to the creation of a new market of contingent goods in which new products, combining physical and socially responsible characteristics, are sold (Adriani-Becchetti, 2005). Furthermore, the result of excess social responsibility might be reversed if we incorporate preferences of South producers to the social planner problem. In that case we might obtain an interesting result of an oligopolistic market equilibrium which attains the international socially optimal level of social responsibility. We would have therefore an (oligopolistic) market mechanism based on the strategic complementarity between prices and social responsibility which compensates with entirely private and voluntary mechanisms the absence of an international social planner.

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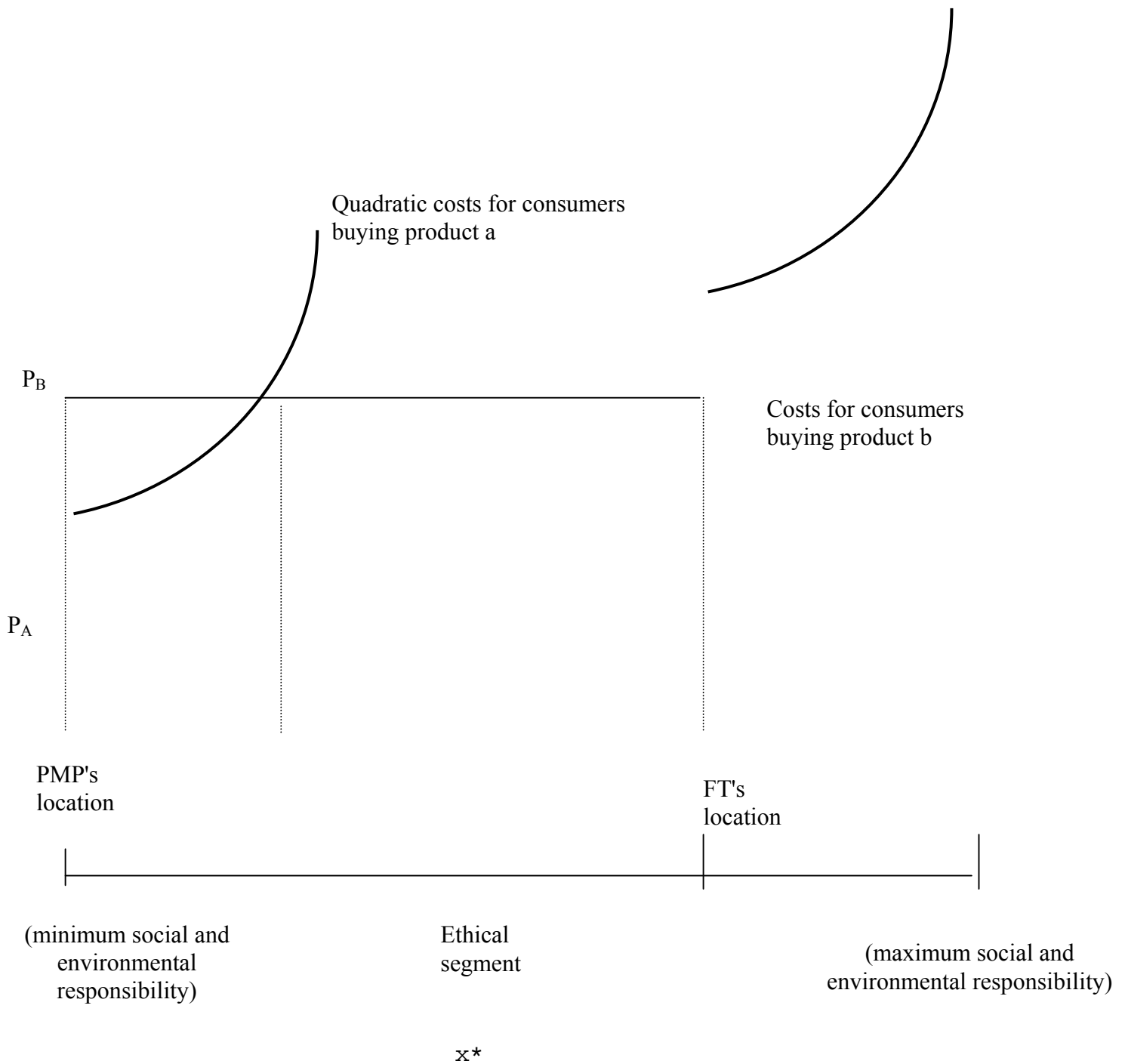
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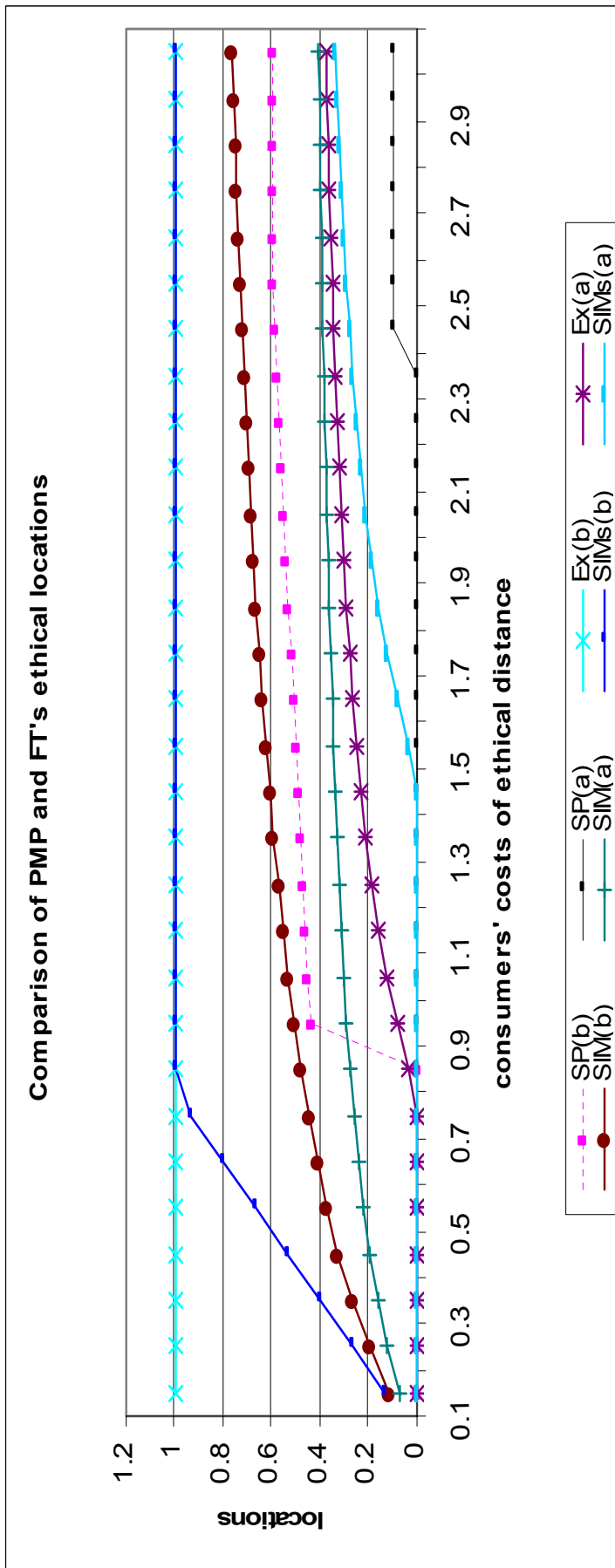
Figure 1. The ethical product differentiation and the asymmetric costs of ethical distances



Legend: moving to the left of the ethical segment implies choosing a product below one's own ethical standards (and therefore is costly) while moving to right implies choosing a product above

one's own ethical standards (and therefore does not give any added psychological benefit or cost to the buyer).

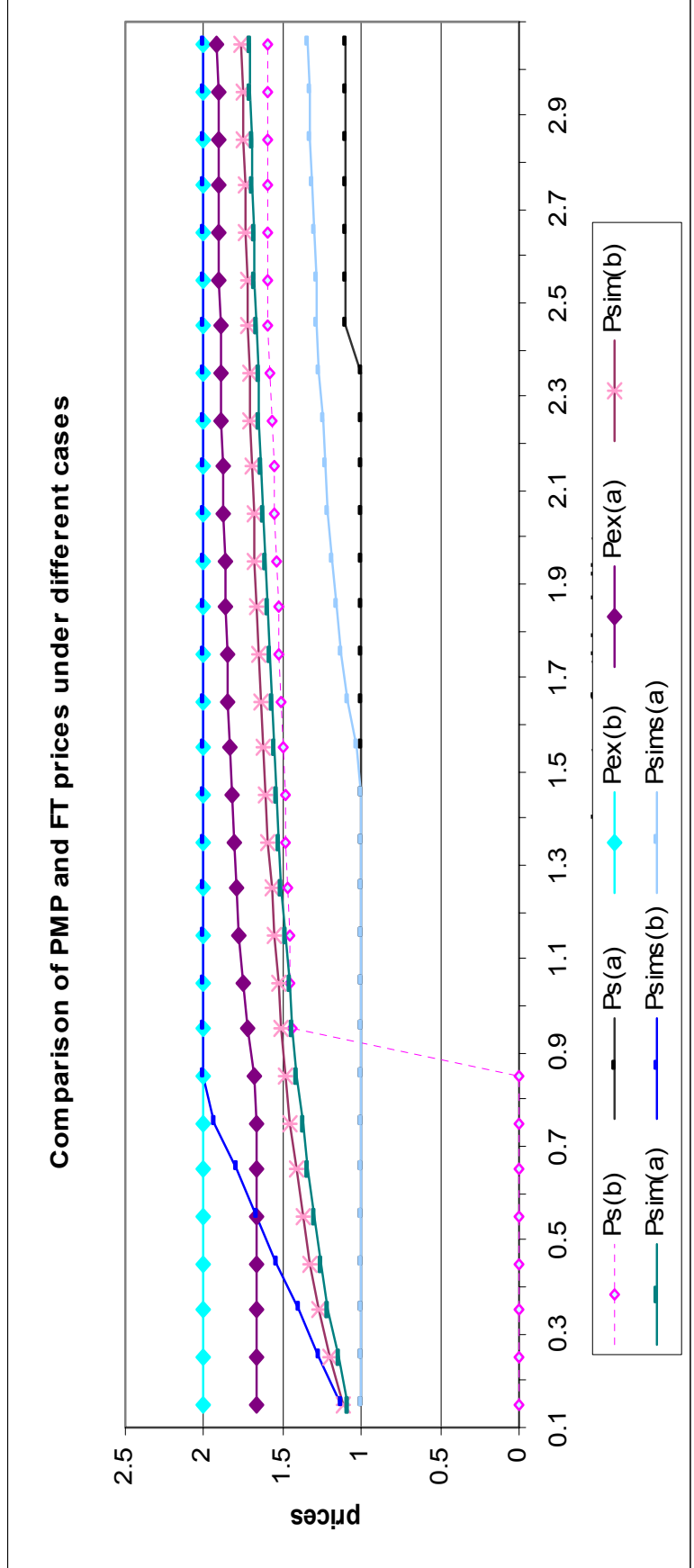
Figure 2. Optimal locations for the two players under different market structures compared with domestic consumers' social optimum



Legend: a (location of the profit maximising producer or PMP on the SR segment), b (location of the fair trader on the SR segment).

$SP(i)$: optimal location of player i ($i=a,b$) for domestic social planner; $SIM(i)$: optimal location of player i in the simultaneous game with altruistic FT; $SIMs(i)$: optimal location of player i in the simultaneous game with selfish FT(i); $Ex(i)$: optimal location of player i when FT location is exogenous and the PMP reacts in prices and ethical location.

Figure 3. Optimal prices for the two players under different market structures compared with domestic consumers' social optimum



Legend: a (price of the profit maximising producer or PMP on the SR segment), b (price of the fair trader on the SR segment).

$PSP(i)$: optimal price of player i ($i=a,b$) for domestic social planner; $PSIM(i)$: optimal price of player i in the simultaneous game with altruistic FT; $PSIMS(i)$: optimal price of player i in the

simultaneous game with selfish $FT(i)$; $PEx(i)$: optimal price of player i when FT location is exogenous and the PMP reacts in prices and ethical location.

