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an international duopoly**

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Consumption home bias and ethnocentrism: an international duopoly

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Abstract

We define a model with two countries and two vertically differentiated goods, a high and a low quality variant, and heterogenous consumers with respect to their willingness to pay for quality. Consumers in one country are *ethnocentric* in consumption. They thrive additional satisfaction when consuming a domestic good rather than a foreign one, since only the former can satisfy their *sense of place*. We investigate the role of trade costs and ethnocentric attitude in shaping the equilibrium configuration of the international duopoly.

Keywords: home bias, relative preferences, vertically differentiated model

JEL Classification: D43, F10, F15.

1 Introduction

Consumption home bias is a well documented phenomenon in existing empirical literature (see for instance Chen, 2004 and Morey, 2016). Surprisingly, there is no formal model explaining this issue. In this paper, we propose an international duopoly model that captures the market effects of home bias. There are several causes put forward to explain the existence of consumption home bias. First, it is often assumed that home bias arises due to the willingness of protecting local employment that otherwise would be reduced in favor of foreign workers. Another reason evoked would be that information about the quality of the domestic products is better than the one obtained on foreign ones. Furthermore, it is argued that geographical frictions generating important trade costs hinder trade and favor local goods. Moreover, consuming local goods has become a campaign of environmentalists' movements who argue that transportation of goods is one of the most polluting activities.

Finally, we believe that a major force behind consumption home bias is driven by a cultural component. As a reaction against a borderless world, nationalist movements have pushed forward the idea of ethnic and national identities. With the aim of preserving the traditional values of

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a country, they tend to generate diffidence and refusal of others and to emphasize cross-country differences. *"In general, the concept of ethnocentrism represents the universal inclination of people to view their own group as the center of the universe, to interpret other social groups from the perspective of their own group, and to reject individuals who are culturally dissimilar while blindly accepting those who are culturally like themselves. The symbols and values of one's own ethnic or national group become objects of pride and attachment, whereas symbols of other groups may become objects of contempt"* (Shimp and Sharma, 280, 1987). A particular illustration of such "populist" views is reflected in *consumer ethnocentrism*. Under consumer ethnocentrism, goods become a means to confirm a culture, a *sense of place* (Cresswell, 2005). Ethnocentric consumers attribute a moral meaning to consumption: purchasing foreign products is viewed as a blameworthy behavior generating a dangerous mix of cultures and weakening thereby the ethnic identity of a country. Of course, conferring to goods a moral, social and cultural content adds to the typical drivers of consumption - price and quality of products - a further dimension, opening the door to *a priori* unexpected market configurations. When goods become conspicuous products, consumers may choose more expensive items which at first sight do not provide a better quality or performance. These goods are chosen mainly because of their conspicuous nature. When consuming these items, people feel to belong to a community. They are aware to obtain a cultural or ethnic identity, putting them far away from foreign citizens. For this identity, they are eventually willing to pay a price premium.¹

In this paper, we provide a theoretical setting that captures key features of ethnocentric consumption and analyze their consequences on market prices and quantities. The key question of our analysis is how a market equilibrium is defined when international trade conflicts with ethnocentric consumption. This conflict arises since trade is meant to develop cross-border exchanges of goods whereas ethnocentric consumption favors domestic consumption. This analysis seems particularly relevant when foreign and domestic goods display significant quality differences: it is along these goods' features that consumer ethnocentrism develops, citizens in each country identifying the quality of the good with the "quality" of the country they belong to.

In order to disentangle this issue, we define a partial equilibrium model with two countries and two vertically differentiated goods, a high and a low quality good.² Consumers in each country are heterogenous with respect to their willingness to pay for quality. Each country is populated by a firm. Each firm exports its product thereby facing an iceberg cost. Introducing this cost in the model enables to consider how the profitability to produce a good changes when trade gets more and more intense. We assume that consumers in one country attribute a social content to the goods. In particular, they thrive additional satisfaction when consuming a domestic good rather than a foreign one, since only the former can satisfy their *sense of place*. By contrast, they suffer a psychological penalty if they consume the foreign product. Borrowing from the literature of conspicuous consumption and relative preferences, we capture the social benefit and the social penalty through the quality gap between variants and can be interpreted as a proxy of cultural distance between countries. We assume that consumers in the other country do not have any concern with respect to cultural content of products and only judge the intrinsic quality of

¹Since Veblen (1899), in the theory of conspicuous consumption the utility (or status) of a consumer depends on the comparison between her own consumption decision and that of others. Under conspicuous consumption, consumers are willing to pay a price premium for a functionally equivalent good for signalling their wealth or other specific characteristics, such as culture or religious attitude.

²A good survey of the industrial organisation models nested with international trade is Krugman (1989).

variants.

Accordingly, under the assumption of country-specific relative preferences, we characterize the equilibrium configuration of the international duopoly. In particular, we first describe the role of these preferences capturing the ethnocentric consumption by comparing this equilibrium with a baseline where relative preferences are absent. Second, we compare the two equilibria arising with and without ethnocentric consumption. Finally, we study the effect of a trade cost reduction on the equilibrium configuration.

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 first characterize the scenario where consumers in the country where the high-quality good is produced display relative preferences, and then the reverse case with ethnocentric consumers being in the country where the low quality good is produced (Section 6). Then, we conclude in Section 7.

2 Related literature

Our analysis develops along several research lines. The key ingredient that consumers have a social identity stems from Tajfel and Turner (1979)'s pioneering contribution to psychology. They formulate a process for a social identity to be defined so that people are putted in categories and then they are contrasted with other groups, thereby generating a sense of place. This perspective is at first sight far from the mainstream view in economics postulating the existence of a rational and selfish agent with given preferences. Still, it has opened the door among economists to the analysis of social interaction in shaping collective values, preferences and economic behavior. In 90's Akerlof introduces the notion of social decision in economic theory and describe the process through which people choose their position in a *social space*.³ In a companion stream of literature on endogenous preferences, Bowles (1998) analyses the effects of institution on preferences, which are considered to be endogenously determined. Later, Benabou and Tirole (2006) emphasize the role of beliefs as drivers for a pro-social behavior.

Starting from these contributions, we shift the focus of our analysis on the effect of social identity on economic choices when trade coexists with an ethnocentric culture.⁴ Finally, in order to formalize the analysis, we borrow the notion of relative preferences adopted by Ben Elhadj et al. (2015). In their setting of vertical differentiation *à la* Mussa and Rosen (1978) and Gabszewicz and Thisse(1979), consumers value a good along a relative dimension: its relative quality, namely the quality gap with respect to another adjacent variant, determines its ranking along a social ladder and, thus, its economic price. We add to this formalization, a further component which captures consumers' ethnocentric feelings and assume that this component is country-specific.

Last, even though we use a very different setting, our paper is related to existing literature on quality and international trade. Quality and trade literature has considerably expanded since the seminal paper by Linder (1961) showing that product quality matters in the trade patterns among trading partners (Hummels and Klenow, 2005; Verhoogen, 2008; Khandelwal, 2010; Hallak and Schott, 2011; Baldwin and Harrigan, 2011; Fajgebaum et al, 2011). Existing papers have also

³See also Akerlof (1997), Akerlof and Kranton (2000) for a formal notion of *identity*, as a *person's sense of self*.

⁴The idea that consumers may be reluctant to buy foreign product is not recent. It has been introduced by Shimp and Sharma (1987) through the notion of *ethnocentrism*. In their seminal paper, the authors emphasize the role of in-group affiliation and *belief in the morality* of domestic consumption.

analysed how trade liberalization affects quality choice when countries are asymmetric (Cabralés and Motta, 2001). The focus of our paper is on preferences with home bias and how they interplay with trade costs.

3 The model

Consider a two-country model with two vertically differentiated goods. Each country is populated by a single firm. We label h and l each country and the corresponding firm within the country. The h (resp. l) firm produces the high (resp. low) quality variant u_H (resp. u_L). The range of quality is in the interval $[\bar{u}, \underline{u}]$ where \bar{u} is the highest quality level that is technologically feasible and $\underline{u} > 0$ is the lowest one. Each firm can serve both countries. When serving the foreign market, it incurs iceberg trade costs t , $1 \geq t \geq 0$. From the firms viewpoint, this trade cost creates a gap between the quantity produced to serve the foreign market and the one generating profits. When t is closer to 1, trade costs are relatively low and the quantity produced to serve the foreign market tends to coincide with the one determining profits. When t is close to 0, the gap between the quantity which could possibly generate profits and the one targeted to the foreign market is relevant.

As for the demand side, in each country, consumers are characterized by their willingness to pay for quality indexed by θ , uniformly distributed over the interval $[a, b]$. Parameter b denotes the highest willingness to pay for quality. Assuming that countries do not differ in their willingness to pay enables us to focus on the role of attitude toward local/foreign goods as unique driver to a change in the equilibrium configuration with respect to a standard vertical product differentiation setting.

4 The baseline scenario: absence of home bias

We first consider a closed economy scenario where, in absence of trade, a monopoly in country i only serves the domestic market i , $i = h, l$. Consumers display the same preferences with respect to variants, so that their indirect utility function $U_i(\theta)$ writes as

$$U_i(\theta) = \begin{cases} \theta u_h - p_h & \text{if she buys h} \\ \theta u_l - p_l & \text{if she buys l} \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

In this case, the indifferent consumer between buying variant i and not buying at all is $\hat{\theta}_i = \frac{p_i}{q_i}$ with $i = h, l$. Then, it is immediate that, at equilibrium, price and quantity p_i^A and q_i^A are:

$$p_h^A = \frac{1}{2}u_h b \text{ and } p_l^A = \frac{1}{2}u_l b$$

$$x_h^A = \frac{1}{2}b \text{ and } x_l^A = \frac{1}{2}b,$$

where the subscript A stands for autarky.

In the case of open economies the market structure is a duopoly with firms competing in an international economy. The corresponding demand function of each firm can be written as follows

$$x_h(p_h, p_l) = t\left(b - \frac{p_h - p_l}{u_h - u_l}\right) + \left(b - \frac{p_h - p_l}{u_h - u_l}\right)$$

$$x_l(p_h, p_l) = \left(\frac{p_h - p_l}{u_h - u_l} - a\right) + t\left(\frac{p_h - p_l}{u_h - u_l} - a\right)$$

Maximizing profit $\pi_i = p_i x_i(p_i, p_j)$, $i, j = h, l$, $i \neq j$, of firm i yields the candidate equilibrium prices

$$\begin{aligned} p_h^* &= \frac{1}{3} (2b - a) (u_h - u_l) \\ p_l^* &= \frac{1}{3} (b - 2a) (u_h - u_l). \end{aligned}$$

Notice that equilibrium prices do not depend on iceberg costs which only affect the quantity sold in each country.

The corresponding demands at equilibrium write as

$$x_h^* = \frac{1}{3} (t + 1) (2b - a) \text{ and } x_l^* = \frac{1}{3} (t + 1) (b - 2a).$$

In this setting, the typical effects of trade on the equilibrium configuration emerge so that the equilibrium prices of the variants decrease and the corresponding demands raise as trade gets more and more liberalized.

5 Home bias in country h

Now, we move to consider a different setting where each variant is evaluated not only on the basis of its intrinsic quality but also in term of its sociocultural content. More specifically, we assume that consumers in country h thrive additional satisfaction when consuming the locally produced good h . This good represents the national cultural: its buyer feel to protect a national identity. By contrast, they incur a psychological suffering when consuming the foreign good l . This suffering is not due to the lower quality l wrt h , but to the awareness that this variant is produced by a foreign firm instead of a national one. Accordingly, this consumption choice benefits the foreign producer and indirectly spread a different cultural from the national one. To formalize these ideas, we use a vertical differentiation model *à la* Mussa and Rosen, with relative preferences, nested with a *cultural* component, namely an ethnocentric attitude. Thus, the utility function $U^h(\theta)$ of a h -consumer is given by

$$U^h(\theta) = \begin{cases} \theta u_h - p_h + \lambda(\gamma_b u_h - u_l) & \text{if she buys } h \\ \theta u_l - p_l - \lambda(\gamma_p u_h - u_l) & \text{if she buys } l \end{cases} \quad (2)$$

This h -consumer who consumes good h has an additional utility benefit given by $\lambda(\gamma_b u_h - u_l)$; whereas when she buys l , she suffers a psychological frustration measured by $\lambda(\gamma_p u_h - u_l)$. Parameter λ magnifies the sociocultural component independently whether this is a benefit or a frustration. It captures the intensity of these social feelings. Parameter γ_j , $j = b, p$ captures the feelings of satisfaction, say a benefit, γ_b or frustration, say a penalty, γ_p generated by consuming variant h or l , respectively. We assume that the social component $\lambda(\gamma_b u_h - u_l)$ is different from the psychological penalty $\lambda(\gamma_p u_h - u_l)$: $\theta > \gamma_b > \gamma_p > 1 > \lambda \geq 0$.

To guarantee that the utility level of a native consumer buying the good l is *a priori* positive (i.e. $\theta u_l - \lambda(\gamma_p u_h - u_l) > 0$), it must hold that

$$\frac{\lambda + \theta}{\lambda} \frac{u_l}{u_h} > \gamma_p.$$

In country l , consumers do not attribute any cultural content to consumption. Accordingly, they choose the variant depending on the quality and the corresponding price. Thus, the utility function of a consumer in country l is

$$U^l(\theta) = \begin{cases} \theta u_h - p_h & \text{if she buys } h \\ \theta u_l - p_l & \text{if she buys } l \end{cases} .$$

In line with the traditional model of vertical product differentiation, the marginal consumer in each group $\theta_h(p_h, p_l)$ and $\theta_l(p_h, p_l)$, respectively write as

$$\theta_h(p_h, p_l) = \frac{p_h - p_l - \lambda(u_h(\gamma_b + \gamma_p) - 2u_l)}{u_h - u_l}$$

$$\theta_l(p_h, p_l) = \frac{p_h - p_l}{u_h - u_l}$$

If $\lambda = 0$, we recover the traditional expression of the marginal consumer in the vertical differentiation model. In this framework, the demand functions faced by firms h and l write, respectively, as:

$$x_h = (b - \theta_h(p_h, p_l)) + t(b - \theta_l(p_h, p_l))$$

$$x_l = t(\theta_h(p_h, p_l) - a) + (\theta_l(p_h, p_l) - a).$$

Maximizing the profit function of firm i , $\Pi_i = x_i p_i$, with $i = h, l$ we get the optimal price p_i^{**} :

$$p_h^{**} = \frac{((t+1)(u_h - u_l)(2b - a) - \lambda(-2u_l + \gamma_b u_h + \gamma_p u_h))(t - 2)}{3t + 3}$$

$$p_l^{**} = \frac{(b - 2a)(t+1)(u_h - u_l) - \lambda(-2u_l + \gamma_b u_h + \gamma_p u_h)(2t - 1)}{3t + 3}$$

and then the corresponding optimal quantity x_i^{**}

$$x_h^{**} = \frac{((2b - a)(t+1)(u_h - u_l)) - (\lambda(-2u_l + \gamma_b u_h + \gamma_p u_h)(t - 2))}{3(u_h - u_l)}$$

$$x_l^{**} = \frac{(b - 2a)(t+1)(u_h - u_l) - (2\lambda u_l - \lambda\gamma_b u_h - \lambda\gamma_p u_h)}{3(u_h - u_l)}$$

It is interesting to determine the role of home bias and trade costs in determining the new equilibrium configuration. With respect to home bias scenario, we can write the following:

Proposition 1 *Whatever the level of trade costs, home bias raises the equilibrium price of the high-quality variant and the corresponding quantity with respect to the baseline. The equilibrium quantity of the low quality variant raises too, although its price increases iff trade costs are not too high (i.e. $t < \frac{1}{2}$).*

Proof. $\frac{\partial p_h^{**}}{\partial \lambda} = -\frac{1}{3}(t-2)\frac{-2u_l+\gamma_b u_h+\gamma_p u_h}{t+1} > 0$; $\frac{\partial p_h^{**}}{\partial \gamma_b} = \frac{\partial p_h^{**}}{\partial \gamma_p} = \frac{1}{3}\lambda u_h \frac{2-t}{t+1} > 0$
 $\frac{\partial p_l^{**}}{\partial \lambda} = \frac{1}{3}(1-2t)\frac{-2u_l+\gamma_b u_h+\gamma_p u_h}{t+1} \stackrel{\geq}{\leq} 0 \Leftrightarrow (1-2t) \stackrel{\geq}{\leq} 0$ and $\frac{\partial p_l^{**}}{\partial \gamma_b} = \frac{\partial p_l^{**}}{\partial \gamma_p} = \frac{1}{3}\lambda u_h \frac{1-2t}{t+1} \stackrel{\geq}{\leq} 0 \Leftrightarrow (1-2t) \stackrel{\geq}{\leq} 0$
 $\frac{\partial x_h^{**}}{\partial \lambda} = -\frac{1}{3}(t-2)\frac{-2u_l+\gamma_b u_h+\gamma_p u_h}{u_h-u_l} > 0$, $\frac{\partial x_h^{**}}{\partial \gamma_b} = \frac{\partial x_h^{**}}{\partial \gamma_p} = \frac{1}{3}\lambda u_h \frac{2-t}{u_h-u_l} > 0$
 $\frac{\partial x_l^{**}}{\partial \lambda} = \frac{1}{3}\frac{-2u_l+\gamma_b u_h+\gamma_p u_h}{u_h-u_l} > 0$, $\frac{\partial x_l^{**}}{\partial \gamma_b} = \frac{\partial x_l^{**}}{\partial \gamma_p} = \frac{1}{3}\lambda \frac{u_h}{u_h-u_l}$ ■

The economic intuition underlying the above findings can be summarized as follows. Due to the psychological benefit that consuming variant h confers to its buyers, under home bias the price of this variant raises. Still, contrary to the standard case, the corresponding quantity does not decrease. These feelings enlarge the market share of the high-quality producer, which thus can obtain higher profits at equilibrium.

As far as the effect of λ on the price p_l^{**} , this develops along two dimensions. A first *direct* effect is such that when the low quality variant is marketed in a country where consumers suffer a frustration with respect to the foreign good, the foreign producer l is induced to fix a lower price in order to sell the product. The second is an indirect effect: home bias pushes upward the price of the high quality variant. Since price are strategic complements, the higher the equilibrium price p_h^{**} , the higher p_l^{**} . This latter effect prevails when trade is not very liberalized, namely when the frustration suffered by consumers in h is somehow weakened by trade barriers. Interestingly, the corresponding quantity x_l^{**} raises with λ both when $\frac{\partial p_l^{**}}{\partial \lambda} \leq 0$ and $\frac{\partial p_l^{**}}{\partial \lambda} > 0$. The increase of x_l^{**} in the case of $\frac{\partial p_l^{**}}{\partial \lambda} \leq 0$ is not surprising. Under $\frac{\partial p_l^{**}}{\partial \lambda} > 0$ the raise can be explained by taking into account that this scenario only arises when $(1-2t) > 0$ namely when trade costs are high.

When considering the role of trade costs, defining $\check{\lambda} \equiv \frac{(u_h-u_l)(2b-a)}{u_h(\gamma_b+\gamma_p)-2u_l}$, we observe that

Proposition 2 *A reduction of trade costs (i) increases the quantity sold by firm H iff $\lambda < \check{\lambda}$; it increases the quantity sold of firm L whatever the value of λ ; (ii) it decreases the price of both goods.*

Proof. $\frac{\partial p_h^*}{\partial t} = \frac{d}{dt} \left(\frac{((t+1)(u_h-u_l)(2b-a)-\lambda(-2u_l+\gamma_b u_h+\gamma_p u_h)(t-2))}{3t+3} \right) = \lambda \frac{2u_l-\gamma_b u_h-\gamma_p u_h}{(t+1)^2} < 0$
 $\frac{\partial p_l^*}{\partial t} = \frac{d}{dt} \left(\frac{(b-2a)(t+1)(u_h-u_l)-\lambda(-2u_l+\gamma_b u_h+\gamma_p u_h)(2t-1)}{3t+3} \right) = \lambda \frac{2u_l-\gamma_b u_h-\gamma_p u_h}{(t+1)^2} < 0$
 $\frac{\partial x_h^*}{\partial t} = \frac{d}{dt} \left(\frac{((2b-a)(t+1)(u_h-u_l))-\lambda(-2u_l+\gamma_b u_h+\gamma_p u_h)(t-2)}{3(u_h-u_l)} \right) = \frac{1}{3} \frac{(2b-a)(u_h-u_l)-\lambda((\gamma_b+\gamma_p)u_h-2u_l)}{u_h-u_l} \stackrel{\geq}{\leq} 0 \Leftrightarrow$
 $\lambda \stackrel{\leq}{\geq} \frac{(u_h-u_l)(2b-a)}{u_h(\gamma_b+\gamma_p)-2u_l}$
 $\frac{\partial x_l^*}{\partial t} = \frac{d}{dt} \left(\frac{(b-2a)(t+1)(u_h-u_l)-(2\lambda u_l-\lambda\gamma_b u_h-\lambda\gamma_p u_h)}{3(u_h-u_l)} \right) = \frac{1}{3}(b-2a) > 0$ ■

It is worth noticing that when trade gets more liberalized, the optimal quantity of variant h raises if and only if the social component of consumption is sufficiently weak, namely $\lambda < \check{\lambda}$. Indeed, in this case, the upward movement of price p_h^{**} due to the sociocultural driver is not very significant and the traditional effect of expanding demand can be observed under trade costs' reduction. On the contrary, when the sociocultural driver is strong ($\lambda \geq \check{\lambda}$), the price of the high

quality variant is pushed upward to such an extent that the reduction of trade costs cannot favour a demand expansion of this variant.

Interestingly, the reduction of trade costs and home bias exert opposite effect on the equilibrium prices and possibly on the demand of the high-quality variant. Comparing this equilibrium configuration with the benchmark of open economy enables to identify the relative strength of these drivers:

Proposition 3 *When trade costs are low, the demand of goods at equilibrium and the price of the high quality variant are higher under home bias than in the benchmark, whereas the price of the low-quality variant is higher under home bias if and only if trade costs are high.*

Proof. $p_h^{**} - p_h^* = \frac{1}{3}\lambda(-2u_l + \gamma_b u_h + \gamma_p u_h) \frac{2-t}{t+1} > 0$,
 $p_l^{**} - p_l^* = \frac{1}{3}\lambda(-2u_l + \gamma_b u_h + \gamma_p u_h) \frac{1-2t}{t+1} > 0 \iff 1 - 2t > 0$,
 $x_h^{**} - x_h^* = -\frac{1}{3}\lambda(-2u_l + \gamma_b u_h + \gamma_p u_h) \frac{t-2}{u_h - u_l} > 0$ and finally
 $x_l^{**} - x_l^* = \frac{1}{3}\lambda \frac{-2u_l + \gamma_b u_h + \gamma_p u_h}{u_h - u_l} > 0$ ■

Hence, we can conclude that *the typical beneficial effect of trade, namely a larger demand at lower price, can be offset by a home bias component of culture.* Indeed, when an ethnocentric country producing a high quality good exchange with country producing a low-quality good, a larger demand of products can come at expenses of higher prices.

6 Home bias in country l

In this section, we consider an alternative scenario when consumers in country l attribute a sociocultural content to their consumption. More precisely, they thrive additional satisfaction when consuming their own good rather than the one produced in the competing country h . By contrast, they suffer a psychological penalty when consuming the variant u_h . Formally, the utility function of a l -consumer is given by

$$U^l(\theta) = \begin{cases} \theta u_h - p_h - \lambda(\Gamma_p u_l - u_h) & \text{if she buys } h \\ \theta u_l - p_l + \lambda(\Gamma_b u_l - u_h) & \text{if she buys } l. \end{cases} \quad (3)$$

The consumer who consumes good l has an additional utility benefit given by $\lambda(\Gamma_b u_l - u_h)$; whereas when she buys l , then she suffers frustration measured by $\lambda(\Gamma_p u_l - u_h)$, with $\Gamma_j, j = B, P$ capturing the benefit of the frustration. We keep that the social benefit component $\lambda(\Gamma_b u_l - u_h)$ is different from the psychological penalty when consuming the foreign good. To guarantee that the utility level of a consumer buying the good h is a priori larger than the utility level of buying l (i.e. $\theta u_h - \lambda(\Gamma_p u_l - u_h) > \theta u_l - p_l + \lambda(\Gamma_b u_l - u_h)$), it must hold that

$$\frac{(\theta(u_h - u_l) + \lambda(2u_h - \Gamma_b u_l))}{\lambda u_l} > \Gamma_p. \quad (4)$$

We assume that h-consumers do not perceive any social driver when choosing what to consume. Thus, the utility function of a h-consumer is

$$U^h(\theta) = \begin{cases} \theta u_h - p_h & \text{if she buys } h \\ \theta u_l - p_l & \text{if she buys } l \end{cases} .$$

In line with the traditional model of vertical product differentiation, the marginal consumer in each group $\theta_l(p_h, p_l)$ and $\theta_h(p_h, p_l)$, respectively write as,

$$\theta_l(p_h, p_l) = \frac{p_h - p_l + \lambda(u_l(\Gamma_b + \Gamma_p) - 2u_h)}{u_h - u_l}$$

$$\theta_h(p_h, p_l) = \frac{p_h - p_l}{u_h - u_l}$$

In this framework, the demand functions faced by firms h and l write, respectively, as:

$$x_h = (b - \theta_h(p_h, p_l)) + t(b - \theta_l(p_h, p_l))$$

$$x_l = t(\theta_h(p_h, p_l) - a) + (\theta_l(p_h, p_l) - a).$$

Maximizing the profit function of firm i , $\Pi_i = x_i p_i$, with $i = h, l$ we get the optimal price p_i^{***} :

$$p_h^{***} = \frac{(t+1)(u_h - u_l)(2b - a) + (\lambda u_l - 2t\lambda u_l)(\Gamma_b + \Gamma_p) + 2\lambda u_h(2t - 1)}{3t + 3}$$

$$p_l^{***} = \frac{(t+1)(u_h - u_l)(b - 2a) + \lambda u_l((2 - t)(\Gamma_b + \Gamma_p)) - 2\lambda u_h(2 - t)}{3t + 3}$$

Comparing the two optimal prices, we check that $p_h^{***} > p_l^{***}$, since $p_h^{***} - p_l^{***}$ under the condition (4) boils down to $\frac{1}{3}(u_h - u_l)(a + b - \theta)$ which is always positive.

Thus the corresponding equilibrium quantities x_i^{***} , $i = h, l$ write as

$$x_h^{***} = \frac{(2b - a)(t+1)(u_h - u_l) + \lambda u_l(1 - 2t)(\Gamma_b + \Gamma_p) + 2\lambda u_h(2t - 1)}{3(u_h - u_l)}$$

$$x_l^{***} = \frac{(b - 2a)(t+1)(u_h - u_l) + \lambda u_l(2 - t)(\Gamma_b + \Gamma_p) + 2\lambda u_h(t - 2)}{3(u_h - u_l)}$$

We can write the following:

Proposition 4 *Whatever the level of trade costs, home bias raises the equilibrium price and quantity of the low quality variant with respect to the baseline, while it raises the equilibrium price and the corresponding quantity of the high quality good iff $t < 1/2$.*

Proof. $\frac{\partial p_h^{***}}{\partial \lambda} = -\frac{1}{3}(2t - 1) \frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{t+1} > 0$ iff $2t - 1 < 0$, $\frac{\partial p_h^{***}}{\partial \Gamma_b} = \frac{\partial p_h^{***}}{\partial \Gamma_p} = -\frac{1}{3}\lambda u_l \frac{2t-1}{t+1} > 0$ iff $2t - 1 < 0$
 $\frac{\partial p_l^{***}}{\partial \lambda} = -\frac{1}{3}(t - 2) \frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{t+1} > 0$ and $\frac{\partial p_l^{***}}{\partial \Gamma_b} = \frac{\partial p_l^{***}}{\partial \Gamma_p} = -\frac{1}{3}\lambda u_l \frac{t-2}{t+1} > 0$
 $\frac{\partial x_h^{***}}{\partial \lambda} = \frac{1}{3}(1 - 2t) \frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{u_h - u_l} > 0$ iff $2t - 1 < 0$ and $\frac{\partial x_h^{***}}{\partial \Gamma_b} = \frac{\partial x_h^{***}}{\partial \Gamma_p} = -\frac{1}{3}\lambda u_l \frac{2t-1}{u_h - u_l} > 0$ iff $2t - 1 < 0$
 $\frac{\partial x_l^{***}}{\partial \lambda} = -\frac{1}{3}(t - 2) \frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{u_h - u_l} > 0$, $\frac{\partial x_l^{***}}{\partial \Gamma_b} = \frac{\partial x_l^{***}}{\partial \Gamma_p} = -\lambda \frac{u_l}{3u_h - 3u_l} (t - 2) > 0$ ■

Notice that with respect to the previous scenario, in this case home bias raises the equilibrium price and the corresponding quantity of the low quality variant. Also, differently from the previous case, where both the demand were increasing in λ , in this setting the demand of the high-quality good raises iff trade is not very liberalized.

When considering the role of trade, given $\bar{\Gamma} \equiv \frac{(u_h - u_l)(2b - a) + 4\lambda u_h}{2\lambda u_l}$, we obtain that

Proposition 5 *The reduction of trade costs (i) reduces the price of the high-quality good and the low quality good; (ii) it increases the quantity sold by firms h and l if and only if $(\Gamma_p + \Gamma_b) < \bar{\Gamma}$.*

Proof. $\frac{\partial p_h^{***}}{\partial t} = \lambda \frac{2u_h - \Gamma_b u_l - \Gamma_p u_l}{(t+1)^2} < 0$
 $\frac{\partial p_l^{***}}{\partial t} = \lambda \frac{2u_h - \Gamma_b u_l - \Gamma_p u_l}{(t+1)^2} < 0$
 $\frac{\partial x_h^{***}}{\partial t} = \frac{(2b-a)(u_h - u_l) + 2\lambda(2u_h - (\Gamma_b + \Gamma_p)u_l)}{3(u_h - u_l)} > 0$ and $\frac{\partial x_l^{***}}{\partial t} = \frac{(b-2a)(u_h - u_l) + \lambda(2u_h - (\Gamma_b + \Gamma_p)u_l)}{3(u_h - u_l)} > 0$ iff $(\Gamma_p + \Gamma_b) < \frac{((u_h - u_l)(2b-a) + 4\lambda u_h)}{2\lambda u_l}$ ■

In this case, we observe a kind of symmetric effect with respect to the previous scenario. Both equilibrium prices decrease with t , while the low-quality variant increases with the reduction of trade costs if and only if the home bias component is not very strong.

Comparing this equilibrium configuration with the benchmark, we get:

Proposition 6 *The demand and the price of the high quality variant are higher under home bias than in the benchmark iff trade costs are relatively low ($t < 1/2$), whereas the price of the low-quality variant and its corresponding demand are higher under the home bias scenario than in the benchmark, whatever the level of trade costs decrease.*

Proof. $p_h^{***} - p_h^* = \frac{1}{3}\lambda(1-2t)\frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{t+1} > 0 \Leftrightarrow (1-2t) > 0$ while $p_l^{***} - p_l^* = \frac{1}{3}\lambda(2-t)\frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{t+1} > 0$ and $x_h^{***} - x_h^* = \frac{1}{3}\lambda(1-2t)\frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{u_h - u_l} > 0 \Leftrightarrow (1-2t) > 0$ while $x_l^{***} - x_l^* = \frac{1}{3}\lambda(2-t)\frac{-2u_h + \Gamma_b u_l + \Gamma_p u_l}{u_h - u_l} > 0$ ■

It is thus interesting to conclude that the effects of ethnocentric consumption in open economies change depending on the features of the country where this type of culture is widespread. In particular, we observe that consumption home bias always raises the price and the demand of the good which is produced in the ethnocentric country. Also, when home bias arises in country l , namely when a home bias culture is not generated by a better quality of the product, both the price and the demand of the high-quality product can even decrease when trade cost get smaller.

7 Conclusion

In this paper, we define a model with two countries and two vertically differentiated goods, a high and a low quality variant, and heterogenous consumers with respect to their willingness to pay for quality. Consumers in one country are *ethnocentric* in consumption. They thrive additional satisfaction when consuming a domestic good rather than a foreign one, since only the former can satisfy their *sense of place*. We investigate the role of trade costs and ethnocentric attitude in shaping the equilibrium configuration of the international duopoly.

Beyond the fact of providing a model for analyzing home bias, the main result of our analysis is that home bias consumption increases both the price and the quantity of the domestic good. The effect on the price and quantity of the foreign good depends on the level of trade costs.

Three possible extensions of this analysis are feasible. First, the analysis should be extended to the case where home bias appears in both countries simultaneously. Furthermore, it would be also interesting to examine the results obtained assuming a homogeneous good in Cournot competition with a set of ethnocentric consumers in both countries. Finally, one could combine the above analysis with different density of populations in both countries. More generally, the analysis of home bias can be extended through a microeconomic approach.

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