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HETEROGENEITY IN CONFORMISM, FIRM SELECTION, AND HOME BIAS

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Heterogeneity in Conformism, Firm Selection, and Home Bias*

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Abstract

This paper discusses the impact of conformism on product quality, firm selection, and trade patterns. It shows that when consumers have a higher degree of conformism and/or their distribution of conformism becomes more concentrated, the equilibrium average demand falls while product quality rises in a closed economy. In an international trade context, this strengthens the home consumption bias when consumers conform to the behavior of local people. The home bias is mitigated under globalization where individuals tend to conform to people worldwide. The paper also discusses the conditions under which conformism and conspicuousness are reconciled.

Keywords: heterogeneity in conformism; product quality; firm heterogeneity; home bias.

JEL Classification: L11, F12.

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1 Introduction

For many goods, consumption is partly driven by the inclination to conform to peers. Conformity indeed enhances individuals' innate feeling of affiliation, which can operate subconsciously through behavioral mimicry, as in the "Chameleon" effect where individuals unwittingly mimic the facial expression and behavior of others. It also operates through the more mindful goal of social approval where individuals deliberately attempt to gain approval of peers in order to build rewarding relationships and enhance their self-esteem (Cialdini and Goldstein, 2004). For economists, an individual's affiliation with a group is signaled by stronger conformity to peers' behavior and consumption (Brock and Durlauf, 2001; Blume *et al.*, 2011). Conformity is sometimes viewed as the antithesis of conspicuousness. In his seminal book, Veblen (1899) sheds light on the consumption of conspicuous goods which individuals use to signal their social status or avoid "lagging behind the Joneses" (Lutmer, 2005). When status is linked to wealth, conspicuous goods are recognized to have higher quality and prices.

The effect of conformism has been empirically investigated. Jones (1984) discusses the contexts in which some consumers value a good more when the number of other consumers rises. A number of studies confirm a strong impact of conformism amongst young people in purchasing luxury brands (Park *et al.*, 2008) and fashion goods such as apparel (Smucker and Creekmore, 1972; Meyer and Anderson, 2000). Research experiments have confirmed that consumers make their purchase decisions in relation to others' average consumption in many sectors like car, housing, insurance and vacation goods (Alpizar *et al.*, 2005) as well as coffee (Carlsson *et al.*, 2010). Collado *et al.* (2006) highlight a very significant transmission of preferences across individuals for non-food items. The degree of conformism in consumption is also shown to depend on time and societal environments. For instance, social environments with moral violations are shown to activate consumer conformism as a reaction to social disorder (Dong and Zhong, 2017).

The economic literature on conformism and conspicuousness however presents several gaps. First, social influence in consumption behaviors is mostly discussed in rather unconnected strands of the literature either about conformism (Brock and Durlauf, 2001) or conspicuousness (Bagwell and Bernheim, 1996). Second, the literature on conspicuous goods mostly describes consumption of a representative good or a small set of goods. With the exception of Amaldoss and Jain (2005 and 2015), there is no discussion of the impact of conformism on the number and quality of varieties in consumption bas-

kets or its impact on trade patterns. The recent trade literature, however, emphasizes the empirical relevance of extensive margins and quality in international consumption behaviors (Foster *et al.,* 2008; Manova and Zhang, 2012). Third, the literature is silent on the role of heterogeneity in consumers' taste and conformism. The psycho-sociological literature has, however, established significantly lower conformity levels through time and in populations with more individualistic cultures, smaller majority groups and/or a smaller share of females (Bond and Smith, 1996). Finally, the literature has not discussed the link between globalization and conformism. For instance, the recent use of the Internet accentuates international connections in consumption behaviors. Social and commercial platforms report product information according to worldwide scores and rankings (e.g. Amazon, Google search, etc.). Consumers may therefore be moving from local conformism to global conformism. The economic implications of such conformity patterns within populations deserve more attention.

This paper aims at filling those gaps by embedding patterns of conformism and conspicuous behaviors within the same framework, studying their impact on the number and quality of varieties in the consumers' basket of goods and analyzing how they alter trade patterns. To the best of our knowledge, these points have not been addressed in the literature. We follow the literature on conformism and consider that consumers compare their product baskets with each other and suffer from the discrepancy between those baskets (Brock and Durlauf, 2001). In addition, we introduce consumers' heterogeneity in their degree of conformism and taste towards product quality. As in Schott (2004) and others, the paper takes the view that one product has a higher quality than another, if, for the same price, the former product has a higher demand. Accordingly, quality is summarized by a demand shifter for each variety. As to the production side, firms incur a fixed entry cost and produce a single variety with an idiosyncratic quality demand shifter. We follow Foster *et al.*, (2008), Antoniades (2015), and Picard (2015) and concentrate our attention on markets where firm selection is based on the quality of the products. After entry, firms choose to produce for local and export markets according to whether they cover their fixed and variable costs.

Our analysis first shows that conformism and conspicuousness can be reconciled when the consumers who place more value on product quality are also those who are less conformist. In this case, demands under conformism and conspicuousness have similar properties as both stronger conformism and conspicuousness lead to a rise in firms' demands. Then, at the equilibrium, firms producing higher quality goods survive and the average quality is better when consumers have a higher degree of con-

formism or when their distribution of conformism becomes more concentrated. Finally, we show that, when countries open to trade, the home bias is strengthened by an upward shift and concentration of the distribution of conformism when individuals conform to local peers. We finally qualify those properties under global conformism where individuals compare their consumption baskets with consumers in other countries. We show that globalization mitigates home bias in the absence of eccentric consumers.

To our knowledge, the paper is the first attempt to study the impact of consumers' distribution of conformism. We make a formal link between conformism and conspicuousness and embed quality selection and entry in a trade model with local or global conformism. The paper contributes to several strands of economic literature. A full review of this literature is beyond the scope of this introduction so here we outline only the most salient relationships. This paper first relates to the field of social economics, which attempts to explain the nature and consequences of social status and learning in social networks (Benhabib *et al.*, 2010). Although this literature focuses on information and signaling micro-foundations (Bernheim, 1994), it has been a common strategy to simplify micro-economic problems and assume reduced forms of preferences which make explicit references to group aggregate consumption (e.g. asset portfolio analysis, Gollier, 2004; economic geography, Ghiglino and Nocco, 2017). This is also the approach taken in our paper.

Secondly, the paper relates to the network economics literature initiated by Becker (1991) and followers. By taking into account consumption decisions of others, consumers benefit from consumption externality, which is the root of network effects. The main difference here is that externality depends on the average consumption rather than the number of users. In addition, contrary to the usual network effects that increase with aggregate consumption, conformism here is an effect that depends on the average consumption. Liu *et al.* (2014) empirically show that such a dependence on the 'local average' is typical of students' educational efforts. Bellet (2017) shows that the choice of house size depends on the average size in the local housing market. The paper extends this idea to consumption behaviors over endogenous sets of varieties. The paper links to Grilo *et al.* (2001) and Amaldoss and Jain (2005) who study the effect of conformism, snobbishness and the desire for uniqueness on prices in Hotelling type models. Those papers focus on two imperfectly substitutable goods in a closed economy whereas this paper takes a more general equilibrium perspective with many goods and trade. As in this paper, Amaldoss and Jain (2005) show that conformism increases market demand for high-quality products but they do not discuss consumer

heterogeneity, entry or quality selection issues.

Thirdly, the paper compares with Ballester *et al.* (2006) as it builds on similar quadratic preferences over other people's actions. Yet, as consumers each have a zero mass and are symmetric to each other ('fully connected' networks), our model is not designed to study either link formation or network structures. It embeds separate networks of consumers in the analysis of trading countries and local conformism.

Finally, an objective of the paper is to create a link with the trade literature on product quality and firm selection. Patterns of international trade are known to have large discrepancies in the quality of traded goods. As in Schott (2004), Foster *et al*. (2008) and others, product quality here is summarized by a demand shifter for each variety. Trade patterns have also been shown to depend on firms' entry to local and foreign markets. The present model is built according to a structure sufficiently close to Melitz and Ottaviano (2008) to allow comparison with the trade literature. Our model also abstracts from product substitution issues but encompasses the presence of variable markups that depend on the degree of conformism rather than market size (Zhelobodko *et al*., 2012).

The paper is organized as follows. Section 2 presents the baseline model and studies product demands. Section 3 is devoted to the impact of conformism in a closed economy. Section 4 discusses open economies with local and global conformism. Section 5 concludes.

2 Baseline model

We first study a single market encompassing a continuous and endogenous set $\mathcal{N}$ of manufacturing varieties with mass N. Each variety $i \in \mathcal{N}$ embeds a different number of attributes, θ_i, which we call 'quality' for conciseness. The market hosts a set of individuals $h \in \mathcal{H}$ with mass H. Each individual $h \in \mathcal{H}$ consumes a quantity z_h of the homogeneous good and x_{ih} of manufacturing varieties $i \in \mathcal{N}$ and is endowed with the utility function

$$U_h = z_h + \int_{\mathcal{N}} \alpha_{ih} x_{ih} \mathrm{d}i - \frac{1}{2} \int_{\mathcal{N}} x_{ih}^2 \mathrm{d}i - \frac{\delta_h}{2H} \int_{\mathcal{H}\times\mathcal{N}} (x_{ih} - x_{il})^2 \mathrm{d}l\mathrm{d}i \tag{1}$$

where α_{ih} is the individual h's taste shifter for variety i, or equivalently, her perceived quality of variety i (see Foster *et al.*, 2008; Picard, 2015).

There are two novel aspects in these preferences. First, we break down the taste

shifter between specific and common quality features by assuming $\alpha_{ih} \equiv \mu+\theta_i\nu_h$, where μ measures the common taste shifter for all varieties, θ_i is the quality of variety i, while ν_h is the individual h's specific sensitivity to the quality of varieties, which belongs to an interval that we normalize to $[1, \infty)$ without loss of generality. Second, conformism effects are embedded in the last term of the utility function (1). This term shows that each individual suffers from the difference between her consumption basket and that of all others in the same market. The coefficient δ_h measures the *degree of conformism*. The latter intends to map the index of 'attention to social comparison information' (ATSC) that is introduced in social psychology to measure the long term predisposition to conformism and embeds a lot of heterogeneity across individuals (Lenox and Wolf, 1982).[1] To guarantee concavity of the utility function, we impose $\delta_h > -1$. When $\delta_h > 0$, consumer h likes to conform to the consumption of others. In this case, preferences (1) extend the conformism models presented in the literature (Blume *et al.*, 2011) where the parameter δ_h measures the social penalty of being dissimilar, to many goods. It also matches Berheim's (1994) signaling model where consumption baskets x_{ih} are signals over each individual's type (α_{ih} in the current setting).[2] Finally, when $\delta_h \in (-1,\, 0)$, consumer h prefers to adopt a consumption pattern different from others, showing "eccentric", "anti-conformist" or "snobbish" effect. This matches the idea of conspicuousness when this consumer has a high valuation for product quality.[3] Desire for uniqueness is well established in the consumer research literature (Tian *et at.*, 2001). As will be clear in the sequel, such consumers desire to purchase baskets of goods of quality higher than they would in the absence of reference to others. However, as the reader will see, most of our results hinge on the existence of heterogeneity in conformism rather than the presence of eccentric consumers.

In this text, we assume that individuals endowed with higher sensitivity to the quality parameter ν_h are also endowed with a lower conformism parameter δ_h. That is, the covariance between those parameters, $\mathrm{cov}(\nu_h,\, \delta_h) \equiv \frac{1}{H}\int_{\mathcal{H}} (\nu_h - \nu)\,(\delta_h - \delta)\,\mathrm{d}h$, is negative where $\nu = \frac{1}{H}\int_{\mathcal{H}} \nu_h \mathrm{d}h$ and $\delta = \frac{1}{H}\int_{\mathcal{H}} \delta_h \mathrm{d}h$ are population averages. This assumption reflects the idea that the less conformist consumers are those who care more about product quality. Other consumers care less about product quality and are more concerned

[1] The ATSC is also seen as a a measure of social anxiety and is significantly correlated with neuroticism and fear of negative evaluation (Lenox and Wolf, 1982).

[2] It fits that model when types are 'separate' and consume different baskets, which happens in Bernheim (1994) for a low enough conformism parameter δ_h.

[3] This view is similar to Amaldoss and Jain (2005) for whom 'snobs' are negatively affected by the number of consumers of a same good.

about replicating the others' choices by holding a more similar consumption basket to them. Such consumer heterogeneity has been highlighted in the fashion industry[4] but also applies for many other sectors. For the sake of conciseness we call the latter consumers 'low valuation conformists' and the former 'high valuation individualists', although we are only concerned with the difference in their degrees of conformism. This commonly occurs in markets such as those for high tech devices, cars, music, jewelry, housing, etc. where high valuation consumers are not influenced by the crowd. The assumption has a flavor of 'consumerism' as conformists will consume more than what fulfills their intrinsic desire for material goods. Observe that the opposite assumption, where $\mathrm{cov}(\nu_h,\, \delta_h)$ is positive, would simply reverse the results of our paper. That assumption would imply that individualists have lower valuation for consumption and conformists consume below their intrinsic valuation. Such contexts could be found in philosophies and societies promoting materialistic simplicity or deprivation, which seems less relevant in the current global economic context.

As usual in the literature, we are interested in fully diversified consumption in the sense that individuals consume all available varieties: $z_h > 0$, $x_{ih} > 0\ \forall i \in \mathcal{N},\ h \in \mathcal{H}$.[5] The individual h maximizes her utility under the budget constraint $z_h + \int_{\mathcal{N}} p_i x_{ih} di = w_h$ where w_h is her income and the price of the homogeneous good is normalized to one without loss of generality. The income w_h is assumed to be high enough to guarantee a positive consumption of the homogeneous good: $z_h > 0$. We also adopt the convention to denote averages by removing the indices over which an average operation is applied. That is, we denote $x_i = \frac{1}{H}\int_{\mathcal{H}} x_{ih}\mathrm{d}h$, $x_h = \frac{1}{N}\int_{\mathcal{N}} x_{ih}\mathrm{d}i$, and $x = \frac{1}{HN}\int_{\mathcal{H}\times\mathcal{N}} x_{ih}\mathrm{d}i\mathrm{d}h$. The same notation applies for other variables and parameters.

As in the literature on product quality, higher quality comes at the cost of additional inputs (see Manova and Zhang, 2012, for empirical support). Let λ be the cost of each attribute so that the cost c_i and quality θ_i parameters of each variety are linked by the relationship $c_i = \lambda\theta_i$. Following the literature on heterogeneous firms (Melitz, 2003) we assume that firms first enter the market and then decide whether to produce. After entry, the firm randomly receives a quality parameter θ_i which is drawn from the

[4] According to Beaudoin *et al.* (2000), fashion leaders are customers who are more 'socially secure' and spend more money on apparel than others (lower δ_h and higher ν_h). They have been characterized by higher cognitive complexity and better reaction to conflict, uncertainty, rules and authority. With such characteristics, they are more likely to refrain from changing their behaviors or values just to conform to others. It is also reported that they read more fashion magazines, go to more fashion shows, buy more clothing on impulse. Their willingness to pay for quality is higher. Some (but not all) studies associate them with higher educational levels.

[5] We will discuss the conditions for the fully diversified consumption equilibrium in Section 3.

cumulative distribution $G : [\underline{\theta}, \overline{\theta}) \to [0, 1]$. Each firm i incurs a production fixed cost $f > 0$ and produces if its profit π_i is positive, otherwise the firm leaves the market. The reason for strictly positive fixed costs is that $f > 0$ is necessary for fully diversified consumption, i.e. the consumption of all goods by all individuals under taste heterogeneity. In the absence of fixed costs, $f = 0$, the least profitable firm sells (almost) zero output, which would imply that high valuation consumers buy positive quantities and low valuation ones buy negative quantities.

While M stands for the mass of entrants, the set of surviving firms is given by $[0, M] \times \{\xi_i : \pi_i \geq 0\}$ and is equal to the endogenous set of available varieties $\mathcal{N}$. Finally, before entry, each firm i incurs a fixed entry cost that is subject to congestion. Congestion increases with the mass of entrants per inhabitant, M/H. More specifically, the entry fixed cost is assumed to be given by $f_E(M/H)$ where $f_E(0) = 0 < f'_E$. This expresses (unmodeled) crowding out in the input or research sectors or decreasing returns in research or patent activities. Finally, a firm enters if it makes a positive expected profit: $\mathrm{E}\left(\max\{\pi_i, 0\}\right) - f_E(M/H) \geq 0$ where E is the expectation operator over $[\underline{\theta}, \overline{\theta})$.

2.1 Demands

Each individual h maximizes her utility under budget constraint. The first order condition for her consumption of variety i is given by

$$p_i = \mu + \theta_i \nu_h - x_{ih} - \delta_h \left(x_{ih} - x_i\right), \tag{2}$$

where the right-hand side is her marginal utility of consumption or her willingness to pay. The latter rises with her general taste towards varieties μ, the quality of the variety θ_i, and her specific taste towards quality ν_h. The last term on the right-hand side of (2) reflects the conformism effect. In the absence of eccentricity ($\delta_h > 0$), willingness to pay decreases with a larger difference between the individual's own consumption x_{ih} and average per-capita consumption x_i.

Solving (2) for x_{ih} yields the consumer's demand for variety i,

$$x_{ih} = \frac{1}{1 + \delta_h} x^0_{ih} + \frac{\delta_h}{1 + \delta_h} x_i, \tag{3}$$

where x^0_{ih} is her intrinsic demand given by

$$x^0_{ih} = \mu + \theta_i \nu_h - p_i.$$

In the absence of conformism ($\delta_h = 0$), the demand (3) boils down to intrinsic demand, which falls with price p_i and rises with quality θ_i and idiosyncratic taste for quality ν_h. Higher valuation consumers therefore display higher demands for higher quality varieties. In the presence of conformism ($\delta_h > 0$), the individual pushes her consumption towards the average consumption across the market, x_i. Eccentric consumers ($-1 < \delta_h < 0$) will even overshoot their intrinsic consumption, i.e. $x_{ih} > x_{ih}^0$ since $x_{ih}^0 > x_i$. As a result, under the assumption of high valuation individualists, there is no difference between conspicuousness and eccentricity (anti-conformism).

The impact of an increase in the conformism parameter δ_h on individual demand is obtained by differentiating (3) as

$$\frac{\mathrm{d}x_{ih}}{\mathrm{d}\delta_h} = \frac{x_i - x_{ih}^0}{(1+\delta_h)^2}. \tag{4}$$

Obviously, a higher degree of conformism raises the demands of individuals with low intrinsic consumption and diminishes those with high intrinsic consumption. Importantly, because the denominator in (4) rises with δ_h, the latter effect is smaller for individuals with higher degrees of conformism. To make the point, consider a high valuation individualist and a low valuation conformist who face the same tension between the average and intrinsic consumptions; that is, that they face the same (absolute value of) consumption difference $|x_i - x_{ih}^0|$. Then, an equal increase in the conformism parameters δ_h leads to a larger fall in the individualist's demand.[6] Hence, an equal rise in the degree of conformism decreases the demand of high valuation consumers more significantly. Conversely, *a lower degree of conformism increases the demand of high valuation individualists more significantly.* This point will be important in our subsequent discussion on the impact of changes in conformism distribution.

Taking the average of (3) over $\mathcal{H}$ we get the average (i.e. per-capita) demand for variety i

$$x_i = a(\theta_i) - p_i,$$

[6]To understand this more formally, suppose that the consumer has a consumption level higher than average: $x_{ih} - x_i > 0$. To be more precise, we totally differentiate (2) and get $0 = -\frac{\mathrm{d}x_{ih}}{\mathrm{d}\delta_h} - (x_{ih} - x_i) - \delta_h \frac{\mathrm{d}(x_{ih} - x_i)}{\mathrm{d}\delta_h}$. With a higher δ_h, the consumer puts more value on her difference from the average consumption (second term). This reduces her willingness to pay, which is first compensated by a fall in consumption (first term). This fall in turn diminishes her deviation from the average consumption (third term) and gives her an incentive to mitigate her consumption reduction. The smaller the initial degree of conformism δ_h, the smaller this mitigating effect.

where

$$a(\theta_i) = \mu + \theta_i \mathrm{E}(\nu_h \omega_h) \tag{5}$$

denotes the demand shifter of variety i. This is a linear, increasing function of the variety i's quality parameter θ_i. Importantly, it increases with the cross-moment $\mathrm{E}(\nu_h \omega_h) \equiv \frac{1}{H} \int_{\mathcal{H}} \nu_h \omega_h dh$ between taste parameters ν_h and the following 'eccentricity weights':

$$\omega_h = \frac{(1+\delta_h)^{-1}}{\frac{1}{H}\int_{\mathcal{H}} (1+\delta_l)^{-1} \, \mathrm{d}l}.$$

Those weights ω_h are inversely related to the individual's degree of conformism δ_h and capture the degree of eccentricity, non-conformism or social independence. They are positive and have a unit average, i.e. $\omega = 1$. Because of this, the above cross-moment can be written as

$$\mathrm{E}(\nu_h \omega_h) = \nu + \mathrm{cov}(\nu_h, \omega_h) \geq 0, \tag{6}$$

where $\mathrm{cov}(\nu_h, \, \omega_h) \equiv \frac{1}{H} \int_{\mathcal{H}} (\nu_h - \nu)(\omega_h - 1) \, \mathrm{d}h$ is the covariance between ν_h and ω_h. Under our assumption of high valuation individualists, we have $\mathrm{cov}(\nu_h, \, \omega_h) > 0$ since ω_h is inversely related to δ_h. Finally, because $\underline{\nu} \geq 1$, the cross moment $\mathrm{E}(\nu_h \omega_h)$ is larger than one.

When all individuals and varieties are symmetric ($\nu_h = \nu$, $\delta_h = \delta$, and $\theta_i = \theta$), the demand shifter is the same across varieties, i.e. $a = \mu + \theta\nu$. When individuals are symmetric but varieties have different qualities or demand shifters ($\nu_h = \nu$, $\delta_h = \delta$ and $\theta_i \neq \theta_j$), the demand curves are shifted by quality parameter θ_i as in Foster *et al.* (2008), Picard and Okubo (2012), and Antoniades (2015).

Observe that the role of conformism δ_h is expressed through its covariance with consumers' sensitivity to quality ν_h. In the absence of such a dependency, firm product demand x_i is independent of conformism and product quality valuation. In particular, when $\nu = \nu_h$ and $\delta_h \neq \delta$ so that $\mathrm{cov}(\nu_h, \omega_h) = 0$, any change in conformism heterogeneity implies a well-balanced reshuffling of the demands by the individuals with high and low degrees of conformism. When $\nu \neq \nu_h$ and $\delta_h = \delta$, any change in the heterogeneity of ν_h also leads to a reshuffling of the demands of high and low valuation consumers such that the average demand remains the same.

Proposition 1. *Conformism has no impact on aggregate demand in the absence of heterogeneity in taste or conformism and/or their interdependence across individuals.*

Proof. In the text.

By this Proposition, any discussion about conformism needs to consider economies where tastes and conformism are correlated. In this paper, as we mentioned above, we have assumed $\mathrm{cov}(\nu_h,\, \delta_h) < 0$ therefore $\mathrm{cov}(\nu_h,\, \omega_h) > 0$.

Along this paper, we are mostly interested in two changes in the conformity distribution: (i) an increase in the level of conformism for all individuals, and (ii) a mean preserving concentration of the distribution of conformism. Both cases allow a comparison of societies according to their heterogeneity in terms of conformism and consumption baskets. Indeed, an increase in the degree of conformism for all individuals motivates them to mimic each other more intensively. The same is true for a mean preserving concentration since individuals are endowed with a closer degree of conformism. To get a better intuition about the differences in conformism distribution and obtain sharper results on demand properties, it is convenient to study the case of two consumer groups.

2.2 Two consumer groups

To obtain sharper results, consider two consumer groups with a mass H_1 of high valuation individualists and a mass H_2 of low valuation conformists ($H_1 + H_2 = H$) respectively. Those groups are respectively endowed with the degree of conformity δ_1 and δ_2, and sensitivity to quality ν_1 and ν_2, where $\delta_1 < \delta_2$ and $\nu_1 > \nu_2$. The cross-moment $\mathrm{E}(\nu_h\omega_h)$ is then given by

$$\mathrm{E}(\nu_h\omega_h) = \nu_1\omega_1\frac{H_1}{H} + \nu_2\omega_2\frac{H_2}{H} = \frac{\frac{\nu_1 H_1}{1+\delta_1} + \frac{\nu_2 H_2}{1+\delta_2}}{\frac{H_1}{1+\delta_1} + \frac{H_2}{1+\delta_2}}. \tag{7}$$

One can easily check that $\mathrm{E}(\nu_h\omega_h)$ falls with a higher conformism degree of high valuation individualists ($\mathrm{dE}(\nu_h\omega_h)/\mathrm{d}\delta_1 < 0$) and a lower conformism degree of low valuation conformists ($\mathrm{dE}(\nu_h\omega_h)/\mathrm{d}\delta_2 > 0$). As a result, it decreases with any concentration of the conformism distribution ($\mathrm{d}\delta_1 > 0 > \mathrm{d}\delta_2 \Rightarrow \mathrm{dE}(\nu_h\omega_h) < 0$) and, in particular, with a mean preserving concentration of the conformism distribution.[7] Finally, it decreases with an equal and simultaneous rise in each group' degree of conformism

[7] More formally, $\mathrm{d}\delta_1 = (H/H_1)\,\mathrm{d}\varepsilon > 0$ and $\mathrm{d}\delta_2 = -\,(H/H_2)\,\mathrm{d}\varepsilon < 0$ leads to $\mathrm{dE}(\nu_h\omega_h) < 0$.

($\mathrm{d}\delta_1 = \mathrm{d}\delta_2 > 0 \Rightarrow \mathrm{dE}(\nu_h\omega_h) < 0$).[8] Note that similar properties hold for general but sufficiently concentrated conformism distributions.

Those properties allows us to discuss the impact of the distribution of conformism on the average demand x_i for variety i. First, x_i falls with a higher degree of the individualist group's conformism δ_1 or/and a lower degree of the conformist group's δ_2. When high valuation individualists conform more intensively, they prefer to imitate low valuation individuals more closely and therefore decrease their demand. Conversely, low valuation conformists decrease their demands as they refrain from mimicking high valuation individualists. Second, x_i diminishes with a mean preserving concentration of the distribution of conformism. Indeed, when this happens, high valuation individualists conform more intensively and reduce their demands while the other individuals conform less intensively and also reduce their demands. Finally, x_i falls with an equal and simultaneous rise in each group' degree of conformism. As explained above, a higher degree of conformism decreases the demand of high valuation individualists more than it increases that of the conformists. We sum up this discussion in the following proposition:

Proposition 2. *For two consumer groups, demands fall with a mean preserving concentration of conformism distribution and with an equal and simultaneous rise in each group's degree of conformism.*

Proof. In the text.

This model draws from the literature on social interaction in the sense that individuals align their consumption behaviors to the group they belong to (Brock and Durlauf, 2001). In essence, it is not a Veblen framework in which preferences explicitly account for the search for a higher relative status position (Hopkins and Kornienko, 2004; Ghiglino and Nocco, 2017). However, under the above assumption of high valuation individualists, the two models yield similar demand properties: *both conformism*

[8] Let us set δ_l and δ_f to $\delta_l + \varepsilon_l$ and $\delta_f + \varepsilon_f$. Reshuffling (7) gives

$$E(\nu\omega) = \nu_f \left(\frac{\frac{1+\delta_f+\varepsilon_f}{1+\delta_l+\varepsilon_l} \frac{H_l}{H_f} \frac{\nu_l}{\nu_f} + 1}{\frac{1+\delta_f+\varepsilon_f}{1+\delta_l+\varepsilon_l} \frac{H_l}{H_f} + 1} \right),$$

The statement $\mathrm{d}E(\nu\omega)/\mathrm{d}\delta_l + \mathrm{d}E(\nu\omega)/\mathrm{d}\delta_f < 0$ is readily obtained by setting $\varepsilon_l = \varepsilon_f = \varepsilon$ and observing that the latter expression falls with larger ε. The impact of weaker conformism diversity is obtained by setting $\varepsilon_l = -\varepsilon_f = \varepsilon$ and observing that the latter expression also decreases with larger ε. The effect of mean preserving concentration of the distribution of conformism is obtained by setting $\varepsilon_l = \varepsilon H/H_l$ and $\varepsilon_f = -\varepsilon H/H_f$ so that the average δ is independent of ε. Then, it can also be shown that the latter expression falls with ε.

and preference for social status entice individuals to demand varieties of a quality higher than they would otherwise. In this model, it turns out to be the case because more conformist consumers have an intrinsic consumption for low quality varieties but mimic those consumers demanding higher quality products.

We are now equipped to study the case of a closed economy.

3 Closed economy

In a closed economy, firms enter in the market, set their prices and produce if they break even. The set of available varieties $\mathcal{N}$ is endogenous and results from entry decisions. We first determine the equilibrium prices and profits for a given set of available varieties $\mathcal{N}$. Then we study firm selection in the market place and establish the entry condition. Finally, we discuss the impact of conformism on firm selection and the average quality.

Being endowed with a product quality θ_i, firm i chooses the price p_i that maximizes its profit $\pi_i = Hx_i(p_i - c_i) - f$. Its optimal price computes as

$$p_i = \frac{1}{2}\left[a(\theta_i) + c_i\right] = \frac{1}{2}\left[\mu + \theta_i \mathrm{E}(\nu_h \omega_h) + c_i\right]. \tag{8}$$

The profit-maximization price (8) rises with both a higher cost and quality. Denoting the firm i markup by

$$m(\theta_i) \equiv p_i - c_i = \frac{1}{2}\left[\mu + \theta_i(\mathrm{E}(\nu_h \omega_h) - \lambda)\right], \tag{9}$$

the optimal sales and profits are computed as $x_i = m(\theta_i)$ and

$$\pi_i = H\left[m(\theta_i)\right]^2 - f. \tag{10}$$

Firm selection takes place because firms produce only if they get positive profits. If $\mathrm{E}(\nu_h \omega_h) > \lambda$, both markups and profits increase with quality θ_i so that firms with low quality may become unprofitable. In this case, high quality firms survive. This occurs when consumers put a sufficiently high valuation ν_h on product quality (i.e. product attributes) or the cost of each product attribute λ is not too high, i.e. $\lambda \leq 1$. We show in Appendix that conformism has the same impact on market outcome in the opposite case when markups decrease with quality θ_i. In what follows, we assume $\lambda \leq 1$ so that quality selection occurs. Such an assumption is consistent with Foster *et al.*'s (2008)

results, according to which market selection stems from firms' profits and is not well related to cost efficiency. In other words, firms survive because they benefit from higher demands.

For further properties, we apply the above two group framework. It can readily be checked that the set of economic parameters supporting quality selection gets wider for a lower conformism degree of high valuation individualists and a higher conformism degree of low valuation conformists. It also expands for any mean preserving spread of conformism distribution and for any equal and simultaneous fall in each group's degree of conformism. This is because all those changes increase $\mathrm{E}(\nu_h\omega_h)$ and therefore the height and slope of each firm's markup function $m(\theta_i)$.

We can now characterize the set of firms that get selected out of the market. Since markups and profits increase with cost and quality, there exists a quality cutoff θ_D such that all firms i with $\theta_i \geq \theta_D$ produce and others exit the market. The set of surviving qualities is given by $[\theta_D,\, \overline{\theta})$ while the set of active firms is equal to the set of available varieties $\mathcal{N} = [0,\, M] \times [\theta_D, \overline{\theta})$ and the mass of active firms N is equal to $M\,[1 - G(\theta_D)]$. The quality cutoff is given by the zero profit condition: $\pi_D = H\,[m(\theta_D)]^2 - f = 0$. Equivalently, using (9) we get

$$\theta_D = \max\left(\underline{\theta},\, \frac{2\sqrt{f/H} - \mu}{\mathrm{E}(\nu_h\omega_h) - \lambda}\right), \tag{11}$$

where the denominator is positive. When the ratio is low enough, the quality cutoff is equal to the lowest quality $\underline{\theta}$ and there is no selection in the economy. Otherwise, there exists a selection which gets tougher (θ_D rises) for a larger fixed cost f, smaller market size H, lower common taste shifter μ, and lower covariance $\mathrm{cov}(\nu_h, \omega_h)$. Intuitively, larger fixed costs reduce profits and cause more firms to exit. Smaller market (population) size and weaker importance of specific quality reduce product demands and profits as well. The effect of lower covariance $\mathrm{cov}(\nu_h, \omega_h)$ can be related to our earlier discussion. First, we can apply our two group case in the presence of high valuation individualists ($\mathrm{cov}(\nu_h, \omega_h) > 0$). Since mean preserving concentration of conformism distribution decreases $\mathrm{cov}(\nu_h, \omega_h)$ and the average product demand x_i, it decreases profits and amplifies quality selection (higher θ_D). An equal and simultaneous hike in each group's degree of conformism has the same effect.

Finally, the introduction of conformism heterogeneity in the model such that $\mathrm{cov}(\nu_h, \omega_h) > 0$ weakens quality selection (lower θ_D). Indeed, a model without conformism implies

a distribution of the conformism parameter δ_h centered around $\delta_h = 0$. The introduction of heterogeneity in conformism is equivalent to a shift of this centered distribution to a positive value $\delta_h = \delta > 0$ followed by a mean preserving spread. Since the first operation involves no heterogeneity, Proposition 1 tells us that the product demands and cutoff θ_D do not change. However, as seen just above, a mean preserving spread weakens quality selection (lower θ_D). This discussion is also relevant for the average quality $\widehat{\theta}$ given by

$$\widehat{\theta}\left(\theta_D\right) \equiv \frac{\int_{\theta_D}^{\overline{\theta}} \theta \mathrm{d}G(\theta)}{1 - G(\theta_D)}$$

since it increases with higher θ_D.

Ex-ante, firms enter if they make positive expected profits

$$\mathrm{E}\left[\pi(\theta_D)\right] \equiv \int_{\theta_D}^{\overline{\theta}} \left(H \ \left[m(\theta)\right]^2 - f\right) \mathrm{d}G(\theta).$$

The mass of entrants M is then given by the entry condition:

$$\mathrm{E}\left[\pi\left(\theta_D\right)\right] = f_E\left(\frac{M}{H}\right). \tag{12}$$

This expression defines a unique and positive M because the expected profits are positive and the entry fixed cost f_E is an increasing function.

How does entry vary with changes in conformism distribution? We know that a mean preserving concentration of conformism distribution and an equal and simultaneous rise in conformism reduce all firms' product demands, profits and markups. One can compute

$$\frac{\mathrm{d}}{\mathrm{d}\gamma}\mathrm{E}\left[\pi(\theta_D)\right] = 2H \int_{\theta_D}^{\overline{\theta}} m(\theta)\frac{\partial m(\theta)}{\partial \gamma}\mathrm{d}G(\theta),$$

where γ denotes any parameter associated with conformism distribution. Therefore, because $f_E' > 0$ and because $m(\theta)$ falls with those changes in the distribution of conformism, the mass of entrants M must fall. In addition, since those changes in conformism distribution also raise θ_D, the set of all available varieties $\mathcal{N} = [0,\ M] \times [\theta_D,\ \overline{\theta}]$ necessarily shrinks. Finally, by the same argument as above, it can be inferred that the introduction of heterogeneity in conformism in the model is equivalent to a mean preserving spread and leads to the opposite result.

One must verify the existence and uniqueness of this equilibrium. The market equi-

librium is defined by the threshold value θ_D and mass of entrants M that solve (11) and (12) and yield full consumption diversification: $x_{ih} > 0 \; \forall i, h$. The equilibrium is unique because (11) returns a unique θ_D and (12) returns a unique M since $f'_E > 0$ and $f_E(0) = 0$. It therefore exists if

$$x_{ih} = \frac{1}{1+\delta_h}\left[\mu + \theta_i(\nu_h - 1) + \frac{\delta_h - 1}{2}\left(\mu + \theta_i(\mathrm{E}(\nu_h\omega_h) - \lambda)\right)\right] > 0 \tag{13}$$

holds for $\forall i, h$. Observe first that the equilibrium exists for sufficiently weak heterogeneity of conformism. Indeed, for sufficiently narrow distributions of ν_h and δ_h, the sensitivity parameter ν_h gets close to its average ν and also to the cross-moment $\mathrm{E}(\nu_h\omega_h)$. It can readily be shown that the squared bracket in condition (13) is strictly positive when one replaces ν_h and $\mathrm{E}(\nu_h\omega_h)$ with ν. By continuity, it is also positive for narrow enough distributions of ν_h and δ_h. Second, because $\nu_h \geq 1$, an equilibrium also exists for $\delta_h > 1$ for all $h \in H$. That requires a high degree of conformism. In that case, the lowest valuation consumers put a high enough valuation on product attributes and mimic higher valuation consumers, which entices them to purchase all available varieties. When the existing degrees of conformism δ_h are lower than 1, the existence of an equilibrium imposes a quality upper bound $\overline{\theta}$ so that the lowest valuation consumers purchase the product with the highest quality $\overline{\theta}$. To clarify this, let us come back to the case of two consumer groups. Then, condition (13) is more stringent for conformists and can be reshuffled as

$$(1-\delta_2)(\nu_1 - 1)\omega_1\frac{H_1}{H} + \left((1-\delta_2)\omega_2\frac{H_2}{H} - 2\right)(\nu_2 - 1) + (1-\delta_2)(1-\lambda) < (1+\delta_2)\frac{\mu}{\theta_i},$$

where ω_1 and ω_2 are the eccentricity weights of individualists and conformists. As before, since $\nu_2 > 1$, the left-hand side is negative and the condition is always satisfied for $\delta_2 > 1$. Otherwise, the equilibrium exists only under the condition that θ_i is kept lower than some upper bound $\overline{\theta}$, which is equal to $(1+\delta_2)\mu$ divided by the above left-hand side. From now on, we assume that (13) holds and restrict the support of quality θ_i to $[\underline{\theta}, \overline{\theta})$, where $\overline{\theta}$ can eventually be set to ∞ when $\delta_2 > 1$.

This discussion yields our main result:

Proposition 3. *Consider an economy with quality selection. Then, (i) an equilibrium with full consumption diversification exists under the condition (13). (ii) A mean preserving concentration of the conformism distribution strengthens quality selection, narrows the range of available quality levels and diminishes the mass of entrants and available varieties. (iii) An equal and*

simultaneous increase in each group's degree of conformism produces the same effect. (iv) The average cost and quality in the economy increases with stronger quality selection.

Proof. In the text.

4 Trade and home bias

In an international trade context, conformism is likely to impact the pattern of trade, and in particular, the home biases according to which consumers favor local goods over imported ones. In the trade literature, home biases are associated with the 'missing-trade' puzzle and usually explained by the existence of biased preferences (Trefler, 1995), incomplete specialization (Haveman and Hummels, 2004), and intermediate goods (Hillberry and Hummels, 2002). In this section we discuss how conformism may also contribute to or mitigate this puzzle. We show the conditions under which conformism to local people strengthens the consumption discrepancies between local goods and imports. By contrast, conformism to worldwide consumers mitigates those discrepancies in the absence of eccentric consumers.

To discuss the impact of conformism on the consumption bias, we extend the above model to two countries that trade with each other. To focus on the effect of conformism, we assume symmetric countries with the same preferences, same sets $\mathcal{H}$ and masses H of households, and same production technologies.

4.1 Local conformism

We first assume that individuals are characterized by *local conformism* in the sense that they compare their consumption baskets only with local consumers.

As before, in each country, producers pay an entry cost $f_E(M/H)$ which is subject to congestion, and draw a quality θ_i from the same cumulative distribution function G. For their local market, producers incur a marginal cost $c_i = \lambda\theta_i$ and a domestic fixed cost f_D for distribution network, marketing, and other market specific inputs. In the export market, exporters face a higher marginal cost τc_i, which includes an iceberg trade cost, $\tau > 1$. They also face an export fixed cost f_X which includes the same inputs as for the domestic market. As we are interested in the issue of conformism, we avoid discussing the impact of local and export fixed costs by setting $f \equiv f_D = f_X$. One can check that our results remain qualitatively the same for any export fixed costs that are bigger than domestic ones because of tax, language, cultural, distribution barriers in

export markets (i.e. $f_D \leq f_X$). After entry, firms decide whether to sell in the local and export markets. Fixed costs are also assumed to be high enough to ensure positive individual demand $\min_h x_{ih} > 0$ for all $h \in \mathcal{H}$ for local and imported varieties. Because the countries are symmetric, we suppress the country specific subscript.

Per-capita demand for variety i at domestic and foreign markets are given by

$$x_i^D = a(\theta_i) - p_i^D, \qquad x_i^X = a(\theta_i) - p_i^X, \tag{14}$$

where $a(\theta_i)$ is defined in (5). Each firm i chooses the prices p_i^D and p_i^X that maximize its operating profit $\pi_i = \pi_i^D + \pi_i^X$, where $\pi_i^D = Hx_i(p_i^D - c_i) - f$ is the domestic profit and $\pi_i^X = Hx_i(p_i^X - \tau c_i) - f$ is the export profit. The optimal domestic and export prices can be computed as

$$p_i^D = \frac{1}{2}\left(\mu + \theta_i \mathrm{E}(\nu_h \omega_h) + c_i\right) \quad \text{and} \quad p_i^X = p_i^D + \frac{\tau - 1}{2} c_i. \tag{15}$$

These prices have the same structure as before, except that the export price includes a share of trade costs passed through to consumers. Because $p_i^X < p_i^D + (\tau - 1)\, c_i$, there is no arbitrage incentives for consumers to purchase foreign varieties abroad and pay the trade cost themselves. Equilibrium profits are given by $\pi_i^D = H\left[m^D(\theta_i)\right]^2 - f$ and $\pi_i^X = H\left[m^X(\theta_i)\right]^2 - f$ where, using $c_i = \theta_i$,

$$\begin{aligned} m^D(\theta_i) &\equiv p_i^D - c_i = \frac{1}{2}\left(\mu + \theta_i \mathrm{E}(\nu_h \omega_h) - \lambda \theta_i\right), \\ m^X(\theta_i) &\equiv p_i^X - \tau c_i = \frac{1}{2}\left(\mu + \theta_i \mathrm{E}(\nu_h \omega_h) - \lambda \tau \theta_i\right) \end{aligned}$$

are local and export markups.

As in the closed economy case, firm selection takes place because firms exit if they do not break even. Because of country symmetry, domestic and export cutoffs $(\theta_D,\, \theta_X)$ are identical across countries. Quality selection arises when markups increase with higher quality θ_i and cost c_i. As in the previous section, we assume that λ is sufficiently small to give rise to quality selection in both local and export markets, so that we assume $\mathrm{E}(\nu_h \omega_h) > \lambda \tau$. [9]

Since markups and profits increase with θ_i in local and export markets, firms pro-

[9] The analysis and results for cost selection are similar to those obtained for the quality selection. Thus, we omit them for brevity.

duce if they have a quality parameter θ_i higher than the thresholds

$$\theta_D = \max\left(\underline{\theta},\ \frac{2\sqrt{f/H}-\mu}{\mathrm{E}(\nu_h\omega_h)-\lambda}\right), \qquad \theta_X = \max\left(\underline{\theta},\ \frac{2\sqrt{f/H}-\mu}{\mathrm{E}(\nu_h\omega_h)-\lambda\tau}\right). \tag{16}$$

Because $\theta_X \geq \theta_D$, quality selection is stronger for imports. This is because the price of quality attributes is higher for imported varieties, which reduces consumer demands and exporters' profits.

Before entry, expected profits are given by

$$\mathrm{E}\left[\pi\left(\theta_D\right)\right] \equiv H\int_{\theta_D}^{\overline{\theta}}\left[\left(m^D(\theta)\right)^2 - f\right]\mathrm{d}G(\theta) + H\int_{\theta_X}^{\overline{\theta}}\left[\left(m^X(\theta)\right)^2 - f\right]\mathrm{d}G(\theta)$$

with $\mathrm{d}\mathrm{E}\pi/\mathrm{d}\theta_D > 0$ and $\mathrm{d}\mathrm{E}\pi/\mathrm{d}\theta_X > 0$. At entry, expected profits balance with the fixed entry cost so that $\mathrm{E}\left[\pi(\theta_D)\right] = f_E(M/H)$. Applying threshold values θ_D and θ_X gives the equilibrium mass of entrants M. Similarly to the analysis of a closed economy, the equilibrium is unique because f_E and $\mathrm{E}(\pi)$ are monotone functions. Furthermore, for any pair of quality and cost $(\theta_i,\ c_i)$, local consumption is always larger than imports, an equilibrium with full consumption diversification exists for non negative manufacturing *imports*:

$$x_{ih} = \frac{1}{1+\delta_h}\left[\mu + \theta_i\left(\nu_h - \lambda\tau\right) + \frac{\delta_h - 1}{2}\left(\mu + \theta_i\left(\mathrm{E}(\nu_h\omega_h) - \lambda\tau\right)\right)\right] > 0.$$

This yields the same equilibrium condition as (13), where the term $-\lambda$ must simply be replaced by $-\lambda\tau$.

How does conformism impact market and trade outcomes? On one hand, up to the occurrence of trade cost τ, the quality thresholds θ_D and θ_X given by (16) are similar to the expressions (11) discussed in the closed economy. Hence a mean preserving concentration and/or a rightward shift of the distribution of conformism makes selection for both local and export markets stronger. However, selection gets disproportionately stronger in the export market since the denominator in θ_D is larger than in θ_X.

On the other hand, conformism affects the consumption bias in favor of local manufacturing varieties. To show this, we respectively compute the relative price and the consumption bias between imported and local varieties with the same product charac-

teristics $(\theta_i,\, c_i)$ as

$$\frac{p_i^X}{p_i^D} = \frac{\mu + \theta_i(\mathrm{E}(\nu_h\omega_h) + \lambda\tau)}{\mu + \theta_i(\mathrm{E}(\nu_h\omega_h) + \lambda)} > 1, \quad \frac{x_i^D}{x_i^X} = \frac{\mu + \theta_i(\mathrm{E}(\nu_h\omega_h) - \lambda)}{\mu + \theta_i(\mathrm{E}(\nu_h\omega_h) - \lambda\tau)} > 1 \tag{17}$$

With higher trade costs, imported varieties have higher prices, which creates a consumption bias in favor of local varieties ($x_i^D/x_i^X > 1$). This home bias rises with lower $\mathrm{E}(\nu_h\omega_h)$ and therefore lower $\mathrm{cov}(\nu_h, \omega_h)$. We can then infer several points. First, as shown above, the introduction of conformism raises $\mathrm{cov}(\nu_h, \omega_h)$ from zero to a positive value. It increases the willingness to pay above the trade cost and therefore reduces the impact of trade costs on the relative price, which gets closer to one. It also raises the product demands in both local and export markets, x_i^D and x_i^X, so that home bias is mitigated. Second, coming back to our example with two group consumers, a mean preserving concentration of the conformism distribution decreases $\mathrm{cov}(\nu_h, \omega_h)$ so that both local and export product demands x_i^D and x_i^X decrease. However, because export demands are smaller, the relative impact of conformism is higher in the export market. This has the effect of increasing the home bias. Finally, an equal and simultaneous increase in each group's degree of conformism has the same effect. Indeed, a higher degree of conformism decreases the demand of high valuation individualists more than that of the followers so that demands for local and imported varieties fall. Because of trade costs, import demands are smaller and are impacted more by the change in conformism, which accentuates the home bias. We summarize the above points in the following proposition:

Lemma. *Consider trade between two symmetric countries. Then, (i) the introduction of conformism mitigates home biases. (ii) A mean preserving concentration of conformism distribution exacerbates home biases and strengthens selection in both markets, with a stronger effect in the export market. (iii) An equal and simultaneous rise in the degree of conformism has the same effect.*

Proof. In the text.

4.2 Global conformism

As seen above, a feature of globalization is lower trade costs. Another feature is the emergence of *global conformism*, by which consumers tend to compare their consumption behaviors to worldwide trends. A typical example can be found in the adoption of

denim after WWII. The recent use of the Internet accentuates international connections in consumption behaviors as social and commercial platforms report product information according to worldwide scores and rankings (e.g. Amazon, Google search, etc.). In this section, we study how such behaviors may affect trade patterns. To this end, we isolate this feature by concentrating on the move from local to global conformism, keeping trade costs as given. Under global conformism, consumers compare their consumption baskets worldwide. We keep the above symmetric framework with identical preferences, production technology, and population characteristics between countries.

Note at the outset that some varieties may or may not be exported. When a variety is not exported, it has the same domestic demand as under local conformism because local consumers are not given the opportunity to compare their consumption with foreigners'. In this case the demand for variety i is then given by x_i^D in expression (14) while the optimal price is given by p_i^D in (15). The equilibrium local consumption and profit are given by $x_i^D = \frac{1}{2}\left(a(\theta_i) - c_i\right)$ and

$$\pi_i^D = \frac{H}{4}\left(a(\theta_i) - c_i\right)^2 - f, \tag{18}$$

so that the threshold value for non-exporters is determined by θ_D in (16). Moreover, prices, consumption, profits and quality selection are identical under local and global conformism.

Results differ when a variety sells in both domestic and export markets. Local and export markets become interdependent because consumers compare the consumption of this variety across borders. Such interdependence makes our analysis slightly more involved compared to the standard trade literature. The demand for a variety i by household h in the domestic x_{ih}^D and export market x_{ih}^X are equal to

$$x_{ih}^D = \frac{1}{1+\delta_h} x_{ih}^{0D} + \frac{\delta_h}{1+\delta_h} x_i, \tag{19}$$

$$x_{ih}^X = \frac{1}{1+\delta_h} x_{ih}^{0X} + \frac{\delta_h}{1+\delta_h} x_i, \tag{20}$$

where $x_{ih}^{0D} = \mu + \theta_i \nu_h - p_i^D$ and $x_{ih}^{0X} = \mu + \theta_i \nu_h - p_i^X$ are intrinsic demands, which would take place without conformism, and x_i is the average of the worldwide consumption

$$x_i = \frac{1}{2H}\left(\int_H x_{ih}^D dh + \int_H x_{ih}^X dh\right). \tag{21}$$

The last term in the parentheses is new and expresses the difference between global and local conformism as domestic consumers consider foreign consumption in their decisions. Using (19) to (21), we obtain the average demands for variety i in each country:

$$x_i^D = a(\theta_i) - p_i^D - \frac{\overline{\delta}}{2}\left(p_i^X - p_i^D\right), \tag{22}$$

$$x_i^X = a(\theta_i) - p_i^X + \frac{\overline{\delta}}{2}\left(p_i^X - p_i^D\right), \tag{23}$$

where $a(\theta_i)$ is given by (5) and

$$\overline{\delta} = \frac{1}{H}\int_H \frac{\delta_h}{1+\delta_h}\mathrm{d}h < 1$$

is the weighted average degree of conformism. In the discussion below, we consider the more intuitive case where $\overline{\delta}$ is positive, which occurs in the absence of eccentric consumers ($\delta_h > 0$). We will refer to the opposite case at the end of this section. Global conformism makes domestic and export demand interdependent as both expressions (22) and (23) vary with p_i^D and p_i^X. In particular, an increase in the export price reduces the foreign consumption, which decreases the domestic consumers' reference point and thus, in the absence of eccentric consumers, also reduces their demands.

Firm i makes the profit $\pi_i^D = Hx_i^D\left(p_i^D - c_i\right) - f$ in its local market and $\pi_i^X = Hx_i^X\left(p_i^X - \tau c_i\right) - f$ in its export market. The optimal prices p_i^D and p_i^X that maximize the firm's total profit $\pi_i = \pi_i^D + \pi_i^X$ are computed as

$$p_i^D = \frac{1}{2}\left(a(\theta_i) + c_i\right), \qquad p_i^X = \frac{1}{2}\left(a(\theta_i) + \tau c_i\right) = p_i^D + (\tau - 1)\frac{c_i}{2}. \tag{24}$$

Because (24) is identical to (15), the firm charges the same prices under global and local conformism. The reason is that the firm fully internalizes the interdependence of domestic and export demands. However, the equilibrium consumptions of domestic and exported goods differ under global conformism. They are given by

$$x_i^D = \frac{1}{2}\left(a(\theta_i) - c_i\right) - \frac{1}{4}\overline{\delta}(\tau - 1)c_i, \tag{25}$$

$$x_i^X = \frac{1}{2}\left(a(\theta_i) - \tau c_i\right) + \frac{1}{4}\overline{\delta}(\tau - 1)c_i. \tag{26}$$

Therefore, in the absence of eccentric consumers ($\overline{\delta} > 0$), the introduction of global conformism reduces domestic demand and raises export demand. Indeed, domestic

consumers compare their consumption with that of foreigners who consume less since they pay (a share of) trade costs. By contrast, it entices foreigners to consume larger quantities because they compare with domestic consumers who face lower prices. In other words, global conformism inflates the intensive margins of exported goods. The strength of this effect depends on the weighted average degree of conformism $\overline{\delta}$.

In contrast to local conformism, domestic and export profits are not independent under global conformism. Therefore, firms' export decisions must take into account the effect of global conformism on domestic demands. It can be easily shown that, when firms serve the two markets, their domestic profits are always larger than export profits. Also, the profit of serving only the domestic market is always larger than the profit of serving only the export market. So, firms have the options to sell in both markets, only domestic market or none. When firm i sells in both market, its equilibrium profit simplifies to

$$\pi_i = \frac{H}{4}\left[\left(a(\theta_i) - c_i\right)^2 + \left(a(\theta_i) - \tau c_i\right)^2 - \frac{\overline{\delta}}{2}(\tau-1)^2 c_i^2\right] - 2f. \tag{27}$$

It chooses to serve both markets if (27) exceeds the profit (18) from serving only the domestic market. That is, if and only if

$$\Delta\pi\left(\theta_i\right) \equiv \pi_i - \pi_i^D = 2H\left[\frac{1}{2}\left(\mu + \left(\mathrm{E}(\nu_h\omega_h) - \lambda\tau\right)\theta_i\right)^2 - \frac{\overline{\delta}}{4}(\tau-1)^2\theta_i^2 - \frac{f}{H}\right] \geq 0. \tag{28}$$

Those firms face quality selection in their foreign market if $\Delta\pi_i$ increases with θ_i. One computes

$$\Delta\pi'\left(\theta_i\right) = 2H(\mathrm{E}(\nu_h\omega_h) - \lambda\tau)\mu + H\left[2(\mathrm{E}(\nu_h\omega_h) - \lambda\tau)^2 - \overline{\delta}(\tau-1)^2\right]\theta_i \geq 0.$$

Therefore, in the absence of eccentric consumers ($\overline{\delta} > 0$), global conformism makes quality selection possible for a smaller set of parameters. As before, we focus on the situation where quality selection prevails for firms selling in two markets ($\Delta\pi'\left(\theta_i\right) > 0$) either because $\overline{\delta}$ is not too high or $(\mathrm{E}(\nu_h\omega_h) - \lambda\tau)$ is large enough. Firm i will then export if $\Delta\pi\left(\theta_i\right) \geq 0$, or equivalently if it has a quality θ_i larger than θ_X which is the solution of binding inequality (28). Because $\Delta\pi$ increases with larger θ_i and lower $\overline{\delta}$, one can infer that θ_X rises with higher $\overline{\delta}$.

How does export selection compare between local and global conformism? Technically, the variables under local conformism are given by the above expressions where $\overline{\delta}$

is set to zero. It becomes clear that moving from local to global conformism raises the export quality threshold θ_X if $\overline{\delta}$ is positive. So, in the absence of eccentric consumers, global conformism strengthens quality selection in foreign markets so that fewer firms sell goods abroad and extensive margins fall for exports. Indeed, global conformism reduces domestic demand and augments export demand by the same amount whereas firms' markups are smaller in the export market because of trade costs. Compared to local conformism, firms have lower domestic profits and higher export profits, but the difference in the latter does not compensate for the former. The firms with the lowest quality and profit levels can no longer break even and quit the export market.

We can now discuss the impact of the distribution of the degree of conformism on the quality export threshold θ_X. As seen in previous sections, a mean preserving concentration of the distribution of δ_h reduces the value of $\mathrm{E}(\nu_h\omega_h)$. Since the parameter $\overline{\delta}$ is a concave function of δ_h, it increases with a mean preserving concentration of δ_h. As a result, $\Delta\pi\left(\theta_i\right)$ falls and the quality cutoff θ_X increases (given quality selection $\Delta\pi'\left(\theta_i\right) > 0$). We also know that an equal and simultaneous rise in the distribution of δ_h decreases $\mathrm{E}(\nu_h\omega_h)$. Because $\overline{\delta}$ is an increasing function of δ_h, it increases with such a rise. Then, $\Delta\pi\left(\theta_i\right)$ falls so that an equal and simultaneous rise in conformism distribution raises θ_X. We can conclude that both mean concentration and an equal and simultaneous rise of conformism distribution strengthen quality selection. The distribution of the degree of conformism has the same qualitative effects under local and global conformism.

As to home bias, the ratio of consumption is given by

$$\frac{x_i^D}{x_i^X} = \frac{\mu + \theta_i\left(\mathrm{E}(\nu_h\omega_h) - \lambda - \overline{\delta}\frac{(\tau-1)}{4}\right)}{\mu + \theta_i\left(\mathrm{E}(\nu_h\omega_h) - \lambda\tau + \overline{\delta}\frac{(\tau-1)}{4}\right)},$$

which exceeds 1 because $\overline{\delta} < 1$. Thus, although global conformity decreases consumption of local goods and increases consumption of imported goods, home bias is still there. However, in the absence of eccentric consumers ($0 < \overline{\delta} < 1$), the presence of global conformism mitigates the home bias.

Finally, it is appealing to discuss the trade patterns in the presence of a large enough mass of eccentric consumers so that $\overline{\delta} < 0$. Eccentric consumers ($\delta_h < 0$) have a preference to choose consumption portfolios that differ from the average. Because $\overline{\delta}$ puts more weight on low conformism parameters δ_h, it can become negative for a small mass of sufficiently eccentric consumers (e.g. δ_h close to -1). In such a case, the above results

about the effect of global conformism are reversed. Indeed, the externality between the domestic and export demands in (22) and (23) run in the opposite way when $\overline{\delta} < 0$. Because foreigners are charged higher prices, they consume less of each imported variety than local consumers. This decreases domestic consumers' reference point and motivates eccentric domestic consumers to enhance their 'difference' by raising their own demands. Global conformism now raises the domestic demand and reduces the export demand by the same amount (as shown in (25) and (26)) while firms' markups are smaller in the export market. Firms have higher domestic profits and lower export profits, but the difference in the latter outweighs the former. The firms whose product quality is too low to break even in the export market under local conformism are now able to survive.

We summarize our main results in the following proposition:

Proposition 4. *Consider two trading countries with quality selection in export markets. Then, in the absence of eccentric consumers, moving from local to global conformism inflates export demands, strengthens selection in the export market and mitigates the home bias. Opposite properties hold in the presence of a sufficient mass of eccentric consumers.*

Proof. In the text.

In our context, the home bias does not stem from preference biases. The home bias stems from the effect of trade costs which are strengthened by an increase in the concentration of distribution of local conformism. Thus, local conformism contributes to the explanation of the existence of home bias and the "missing trade" (Trefler, 1995). In addition, by Proposition 4, globalization may accentuate the home bias depending on the characteristics of conformism in the society. To be more precise, globalization mitigates home bias in the absence of eccentric consumers while it reinforces the home bias when the society encompasses high enough shares of eccentric consumers and/or small shares of sufficiently eccentric consumers.

5 Conclusion

This paper sheds new light on the impact of conformism on consumption baskets and product diversity. We show that the existence of conformism leads to higher demand for all varieties and therefore less selection. This pattern bears some resemblance to the excessive consumption of conspicuous goods even though the paper discusses non-specific types of varieties. When the degree of consumer conformism intensifies or gets

more concentrated so that society becomes less heterogeneous, consumers mimic each other more intensively, product demands for varieties decrease and, in turn, firm selection strengthens. The reason is that demands of high valuation individualists and low valuation conformists change in different proportions. As to trade patterns, a less heterogeneous society results in a stronger home bias. In other worlds, consumers disproportionately decrease their consumption of imports because, ceteris paribus, the latter are more expensive.

6 Appendix. Cost selection.

When $\mathrm{E}(\nu\omega) < \lambda$, markups fall with quality and cost so that only low cost firms survive. Such cost selection is typical of Melitz and Ottaviano (2008) where firms are only subject to cost heterogeneity. The study of cost selection is similar as that of quality selection. To emphasize the cost selection process we work with the distribution of cost $c_i \in [\underline{c}, \overline{c})$. Firm i's markup writes as $m(c_i) = \mu - c_i\,(\lambda - \mathrm{E}(\nu\omega))$. We briefly repeat the analysis and spot the main difference with quality selection.

Given that only low cost firms survive, the sets of surviving varieties is given by their cost range $[\underline{c}, c_D]$ while the set of active firms and available varieties is given by $\mathcal{N} = [0,\ M] \times [\underline{c}, c_D]$. The mass of active firms N is equal to $MG(c_D)$. By the zero profit condition $\pi_D = H\,[m(c_D)]^2 - f = 0$, the cost selection threshold is given by

$$c_D = \min\left(\overline{c},\ \frac{\mu - 2\sqrt{f/H}}{\lambda - \mathrm{E}(\nu\omega)}\right)$$

where the denominator is positive. Average cost

$$\widehat{c}\,(c_D) \equiv \frac{\int_{\underline{c}}^{c_D} c\mathrm{d}G(c)}{\int_{\underline{c}}^{c_D} \mathrm{d}G(c)}$$

rises with higher c_D. A larger population H increases both c_D and $\widehat{c}\,(c_D)$. Ex-ante, firms enter if expected profits $\mathrm{E}\left[\pi\left(c_D\right)\right] \equiv \int_{\underline{c}}^{c_D} \left(H\left[m(c)\right]^2 - f\right) \mathrm{d}G(c)$ are non-negative. It is easy to check that those profits monotonically fall with higher cost threshold c_D as markups and profits go lower. The mass of entrants M is then given by the entry condition: $\mathrm{E}\left[\pi\left(c_D\right)\right] = f_E(M/H)$. By the same argument as in quality selection, an equilibrium with full consumption diversification can be shown to be unique and to exist under (13), paying attention of the negative sign of $\mathrm{E}(\nu\omega) - \lambda$. There exist three regimes:

no selection ($c_D = \overline{c}$), complete selection with no supply of manufacture ($c_D = \underline{c}$) and partial selection ($c_D \in (\underline{c}, \overline{c})$). In the latter case, cost selection intensifies when c_D falls; that is, for larger f and λ and for smaller H and $\mathrm{E}(\nu\omega)$, the latter taking place for smaller $\mathrm{cov}(\nu, \omega)$. Comparing this to the quality selection, we infer that both cost selection and quality selection intensifies for the same change in economic and conformity parameters. Finally, since expected profits fall with higher c_D and since f_E is a function increasing with higher M, M falls with higher c_D. Therefore, the sets $[0,\ M]$ and $[\underline{c},\ c_D]$ expand in opposite directions so that the set of available varieties $\mathcal{N} = [0,\ M] \times [\underline{c},\ c_D]$ ambiguously responds to a strengthening of cost selection.

To sum up, quality selection and cost selection behave the same way when economic and conformism parameters change.

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