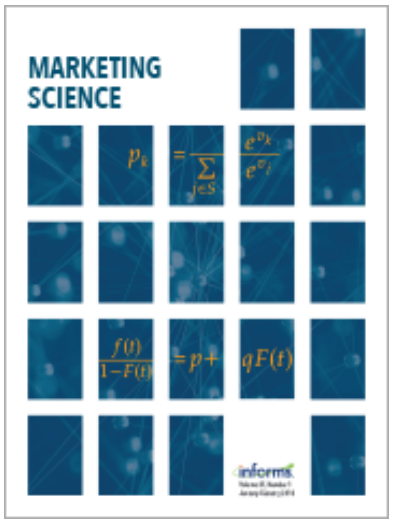

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Breaking Free of a Stereotype: Should a Domestic Brand Pretend to Be a Foreign One?

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Consumers in many emerging markets exhibit a pronounced preference for western and global brands, while domestic brands are often associated with a cheap but low quality image. Frustrated with the negative country-of-origin (COO) stereotype imposed on them, many domestic brands from emerging markets follow a variety of approaches to disguise their COO and pretend to be foreign. This paper studies the strategic aspects of this phenomenon. We consider an experience good market where consumers learn about each brand's quality, using its COO as a prior. Each firm can invest in product quality or COO dissociation; the former generates better quality signals while the latter simply masks the firm's COO identity. The analysis reveals a few main insights. Sharing a reputation leads to a common good problem where firms free-ride on each other's quality investments. As a high quality firm dissociates itself from the stereotype, it ceases to contribute to the COO image but also prevents its low quality peers from free-riding on it. This incurs a negative direct effect but a positive strategic effect on the group image. Consequently, a country's COO image may actually improve when more high quality brands shun their identities and pretend to be foreign. In equilibrium, COO image improves monotonically as firms become more efficient in providing quality. However, the prevalence of COO dissociation may first increase then decrease. We discuss the implications of these results for emerging market brands as well as policy makers.

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1. Introduction

The purchasing prowess of emerging market consumers has long been under the spotlight as companies seek the next growth opportunities. McKinsey and Company (2012b) estimates that by 2025, half of the world's population will join the consuming class and the total annual consumption in emerging markets will grow to $30 trillion. While these rapidly growing markets pose enormous opportunities, many emerging market consumers have exhibited a pronounced preference for foreign and multinational brands, creating a real disadvantage for aspiring local brands. For example, a 2013 survey (World Brand Lab 2013) revealed that in China, the top 10 brands that enjoy the most brand loyalty were all foreign. By contrast, in Japan, the top 10 brands were all domestic. Across a large number of product categories, McKinsey and Company (2012a) found a clear preference for foreign brands by Chinese consumers; even more worrisome for the domestic firms, this preference for foreignness is more pronounced among the young and newly affluent consumer cohorts. Indeed, despite the large differences among emerging markets, this preference for western and global brands seems to be a robust feature of consumer mentality in many developing countries (Credit Suisse 2014).

In general, favorable or unfavorable country stereotypes stem from the performance history of a country's products (Maheswaran et al. 2009). Admittedly, the negative country-of-origin (COO) images are often accurate reflections of emerging market firms' overall lack of technical sophistication. Frustrated with this negative association, however, many emerging market firms have made various attempts to deemphasize or disguise their COO identity. While a firm cannot outright lie about its COO, it can manipulate consumer perceptions about its COO. As shown in a number of studies (Samiee et al. 2005, Anderson Analytics 2007), consumer recognition of a brand's COO is typically imperfect and sometimes malleable. Samiee et al. (2005) demonstrate that the recognition of brand origin is largely driven by consumers association of brand names with languages that suggest country origins. Similarly, Leclerc et al. (1994) show that American brands who choose French sounding names can successfully affect the perceived hedonism of their products. In a survey study, Anderson Analytics (2007) demonstrated that consumers have very

limited knowledge about real-world brands' COO, including some very well known brands.

Indeed, choosing a foreign sounding brand name has become a popular practice among emerging market firms who are concerned about their COO. In some cases, firms may deliberately choose brand names that trigger more favorable COO associations. For example, Giordano and Bossini, despite its Italian-sounding name, is a successful Hong Kong based clothing brand with outlets across Asia, the Middle East, and North Africa. Rossini, a Chinese watchmaker who prides itself as the top domestic brand in a market dominated by foreign competition, ironically has an Italian sounding brand name.[1] Other examples include garment brand "Metersbonwe" based in South China, and outdoor brands "Kailas" and "King Camp."[2] While the latter set of brand names may not necessarily suggest a particular COO, they are definitely foreign sounding to Chinese ears. Similar examples abound in India, with brands such as La Opala, Da Milano, Franco Leone, and Munich Polo selling high quality, premium products to the domestic market, but under foreign sounding names (*The Economic Times* 2012).

In addition to the brand name, a plethora of other cues can shape COO perception. Store display, culture symbols in the brand logo, and the accent and ethnicity of ad models all have the potential to influence COO recognition. For example, Canada's Competition Bureau points out that misleading COO claims can be made through the use of pictures and symbols, e.g., the maple leaf.[3] Walch, a Chinese firm producing antiseptic liquid, uses a medieval-European style helmet as its brand logo in addition to its German sounding brand name. Another Chinese outdoor brand, CanTorp, chooses to only display its English name on many of its storefronts. Its logo features the silhouette of a camel that is strikingly similar to the American cigarette brand except that the camel has two humps rather than one. The Chinese baby formula brand "Scient" used a stars-and-stripes pattern in its packaging.[4] A host of other Chinese brands use European style coats-of-arms as their brand logos. *The Economic Times* (2012) reported that Munich Polo prefer using western models in its ads to reinforce the perception among Indian consumers that it has a German origin.

Interestingly, the above mentioned examples are all successful domestic brands that produce reasonably high quality products. While it is easy to understand their desire to be less Chinese/Indian and more foreign, the strategic implications of COO dissociation are less clear. Building on the rich literature on COO effect, umbrella branding, and statistical discrimination theory, this paper studies the strategic aspects of the COO stereotype. We ask (1) how does a shared reputation affect firms' incentives to provide quality? (2) What governs firms' incentives to invest in COO dissociation to break free of the stereotype? (3) As a country's high quality firms mask their COO identity, what are the implications for the country's COO image? (4) As a group, what are the paths the firms can follow to improve the collective image? We consider a group of firms who share the same COO. Because quality signals are noisy, a brand's COO serves as a prior when consumers learn about each firm's quality, in a Bayesian fashion. The COO stereotype is determined endogenously and corresponds to the group's aggregate past performance. Each firm can invest in its product quality or disguise its COO identity. Quality investment improves the chance that a firm's product will generate a positive quality signal. COO dissociation, on the other hand, is a costly action that merely shapes consumer perception about a firm's COO. When a firm invests in COO dissociation, the consumers are less likely to perceive this firm to be from the focal country. Therefore, they are less likely to apply the COO prior to judge this firm's quality.

Our first set of results confirm the main insights from the collective reputation literature (Tirole 1996, Winfree and McCluskey 2005). In particular, shared reputation creates a common good problem where each firm has the incentive to free-ride on others' quality investment. This leads to insufficient quality investment compared to the socially efficient level. When consumers have moderate tendencies to stereotype, shared reputation hurts the more efficient firms (i.e., ex-post, high quality firms) but the less efficient firms (i.e., ex-post, low quality firms) benefit from the free-riding opportunity. However, when consumers' stereotyping tendency is strong (i.e., individual quality signals are extremely scarce or noisy), the possibility of free-riding hurts high and low quality firms alike. This happens because free-riding hurts incentives so much that even the most inefficient firms would prefer the no-stereotyping benchmark.

In a second step, we study the case wherein firms can invest in COO dissociation to break away from the stereotype. Typically, the most efficient firms, i.e., those who suffer the most from the free-riding problem, also have the strongest incentives to break away from the stereotype. As a high quality firm dissociates itself from its COO, it prevents the rest of the group from free-riding on its quality investment. This incurs

[1] See http://www.rossini.com.cn/en/index.aspx for a history of the company.

[2] In China's case, once a foreign sounding name is chosen, the company usually then transliterates the name into Chinese characters.

[3] See http://www.canadianadvertisinglaw.com/?p=3573.

[4] This company eventually went too far in claiming its American origin and was sued by regulators for deceptive advertising.

a negative direct effect on the COO image. However, facing diminished free-riding opportunities, the less efficient firms now have stronger incentives to invest in quality. This translates into a positive strategic effect on the COO image. Overall, when consumers' tendency to rely on the COO stereotype is moderate, the direct effect dominates the strategic effect. When consumers have strong tendencies to rely on the COO stereotype, the strategic effect comes to dominate. This leads to an interesting scenario in which the COO image improves as more high quality firms dissociate from their COO identity.

Finally, we investigate the firms' joint decisions on quality investment and COO dissociation. We discuss comparative static results focusing on two key parameters, i.e., consumers' tendency to stereotype and firms' cost of quality (i.e., technical efficiency). As expected, the equilibrium COO image increases monotonically as firms gain greater technical efficiency and as consumers rely less on the COO stereotype. Firms' incentives to dissociate from the COO, on the other hand, diminish as consumers rely less on the COO stereotype. Interestingly, when firms make collective improvement in technical efficiency, the impact on COO dissociation is dubious. On one hand, a firm typically finds COO dissociation more attractive as it makes progress in product quality. On the other hand, when firms collectively improve quality, the COO image improves, which makes it less imperative for each firm to break away from the stereotype. As a result, the prevalence of COO dissociation may first increase then decrease when firms make progress in technical efficiency.

We organize the rest of the paper as follows. In §2, we discuss the innovation of the present paper in relation to the literature. Section 3 presents the model setup. The main results are presented in §4. Section 5 provides summarizing remarks and discusses future avenues of research.

2. Literature Review

Our work is related to several literature streams. First, it is related to the rich literature on the COO effect. Maheswaran et al. (2009) and Dinnie (2004) provide excellent surveys of this literature. Early studies in the COO literature established that COO does influence consumer evaluation of a product, by serving as an information cue (Bilkey and Nes 1982, Han 1989). We model COO effect following the informational approach. We do not consider the situations wherein factors external to the products (e.g., hostility between countries) may influence consumer choice (Maheswaran and Chen 2006, Hong and Kang 2006).

More recently, a number of studies have shown that consumers' ability to recognize a brand's COO is in fact quite limited and often malleable (Samiee et al. 2005, Liefeld 2004). Sometimes, consumers cannot tell the COO of a brand. When they do reach a judgment, it is strongly influenced by the association between brand names with languages that are suggestive of COOs (Samiee et al. 2005). Leclerc et al. (1994) found that a French sounding name increases the perceived hedonism of a product made in the United States. Overall, these studies point to the importance of linguistic cues in influencing consumer perception of a brand's COO. This is consistent with the popular practice of adopting a foreign sounding name to mask one's COO. We develop a general model of COO dissociation that includes, but is not limited to, the case of foreign naming.

Second, our work is related to the marketing literature on umbrella branding (Wernerfelt 1988, Montgomery and Wernerfelt 1992, Erdem 1998, Erdem and Sun 2002, Anand and Shachar 2004, Hakenes and Peitz 2008, Cabral 2009) and brand extension (Loken and John 1993, John et al. 1998, Simonin and Ruth 1998). Similar to the papers in this literature, our model revolves around the notion of reputation spillover. There is a key difference between our model and umbrella branding. When a multiproduct firm adopts an umbrella branding strategy, it can coordinate the quality or pricing decisions for all of the products to maximize the total profit. By contrast, independent firms who share a common reputation will make decisions without internalizing other firms' payoffs. This leads to interesting reputational externalities. These are the focus of this study. We allow self-interested firms to unilaterally dissociate themselves from the group identity. To our knowledge, this element is not present in the umbrella branding literature.

Finally, our paper is closely related to the economic literature on statistical discrimination theory (see Fang and Moro 2010 for a review). In his seminal paper on this topic, Phelps (1972) postulates that when a principal observes a noisy signal about an agent's performance, her group identity (e.g., race, gender) contains useful information. The Phelps model corresponds to a Bayesian framework where an agent's group identity serves as a prior. The same basic idea is also discussed by Arrow (1973), and Lundberg and Startz (1983) considers a case where human capital is endogenous but group prior is exogenous. The recent literature on collective and transferable reputation (Tirole 1996, Levin 2009, Tadelis 1999) build on the statistical discrimination paradigm, but focus on the possibility that group reputation is self-fulfilling via a contractual process. We model COO stereotyping following the statistical discrimination paradigm. Consumers are intuitive Bayesian learners who use a brand's COO as the

prior. We consider endogenous quality choice as well as the endogenous formation of the group prior. Most important, we allow for the possibility of COO dissociation. COO dissociation influences the perceived group identity of a focal firm. This departs from the above mentioned papers in statistical discrimination literature, all of which (to our knowledge) assume that the agents' group identity is exogenous and fixed.

3. Model

Consider N firms who share a common COO, g. While the early literature on COO effect considers country image as a single construct, more recent works have pointed out that COO image is often category specific (Roth and Romeo 1992). Toys, electronics, and footwear from China may suffer from a poor COO image, but silk and tea do not. The firms we consider should come from the category(-ies) that, broadly speaking, share the same COO image.[5]

We consider a simple two-stage game. In the first stage, the firms decide how much to invest in product quality, a decision denoted as q_i, and whether to engage in COO dissociation, a decision denoted by $b_i \in \{0, 1\}$, where $b_i = 1$ implies that firm i disguises its COO identity. Both quality investment and COO dissociation are costly. In the second stage, consumers form the COO stereotype, learn about each product's quality, and payoffs are realized. We first explain our formulation of COO stereotyping assuming that a subset of firms engage in COO dissociation.

COO Stereotyping. We model consumer stereotyping following the statistical discrimination paradigm (Phelps 1972, Fang and Moro 2010). In this framework, a firm's group identity serves as a prior when consumers learn about the firm's underlying quality. Consider a subgame where firms choose quality levels $q_1, \ldots, q_N$ and a subset B engage in COO dissociation. Each firm i produces a Bernoulli product that generates a positive experience with probability q_i and a negative experience with probability $1 - q_i$. Consumers learn about each firm's quality in a Bayesian fashion.

Consumers have two pieces of information about brand i. They observe i's COO and a number of quality signals generated by product i. Consumers hold prior belief $Beta(S_g, M_g - S_g)$ about country g firms' quality which, as we will explain shortly, is derived from past experience with country g's products in general. They obtain M_s 0–1 signals about each firm i's performance out of which S_{si} signals are positive. As such, consumers' posterior belief about q_i for any $i \notin B$ is $E(q_i \mid S_g, M_g, S_{si}, M_s)$. The posterior also follows a beta distribution. When S_{si} out of the M_s signals are positive, the posterior mean is

$$E(q_i \mid S_g, M_g, S_{si}, M_s) = \frac{M_g}{M_g + M_s}\frac{S_g}{M_g} + \frac{M_s}{M_g + M_s}\frac{S_{si}}{M_s}. \quad (1)$$

Given the multitude of parameters in the above model, we summarize them in Table 1. Equation (1) reflects the exact idea put forth in Phelps (1972). In essence, consumers' posterior belief about firm i's quality is a weighted average of the group (prior) mean and the sample mean. As such, a firm's COO identity contains useful information when quality signals are limited and noisy. We can define $\rho = M_g/(M_g + M_s)$ as the extent to which consumers rely on the group stereotype to judge a brand's quality. When $\rho \to 1$, consumers acquire very little data about each individual brand and completely revert to the group prior to judge each firm's quality. When $\rho \to 0$, consumers completely rely on the quality signals to infer each brand's true quality. Consequently, the COO stereotype does not affect their judgment. Prior literature has uncovered many factors that affect the extent to which consumers rely on the COO stereotype to evaluate brands, such as brand familiarity (Han 1989), category efficiency, and attribute strength (Maheswaran 1994). As we will explain shortly, we treat M_s as a model parameter but do not make statements about the behavioral determinants of this parameter. For example, a small M_s may imply a lack of actual experience or difficulty with recalling any past experiences (Keller 1993).

Table 1 Definition of Key Parameters

Parameter	Definition	A function of
M_s	The number of quality signals each brand generates.	Exogenous
S_{si}	The number of positive signals brand i generates.	q_i
M_g	The precision of the COO prior, when COO dissociation decisions are $\vec{b}$.	$\vec{b}$
S_g	The positivity of the prior.	$\vec{q}, \vec{b}$
ρ	The weight consumers put on the COO prior.	$\vec{b}$
M_{gb}	The "baseline" precision of the COO prior, when no brand engages in COO dissociation.	Exogenous
ρ_b	The "baseline" weight consumers put on the COO prior, when no brand engages in COO dissociation.	Exogenous

Stereotype Formation. We now explain the determinants of M_g and S_g in the game. In the Phelps (1972) formulation, the precision and mean of the group prior (M_g and S_g in our model) are treated as exogenous parameters. By contrast, we assume that M_g and S_g are endogenously determined, a process which we term stereotype formation.

[5] We thank an anonymous reviewer for this comment.

It has been shown in the literature that a plethora of factors can drive the stereotype formation process, such as past experience, word of mouth, media and expert opinion, etc. See Maheswaran et al. (2009) for a discussion on some of these processes. For example, the media can make a country's COO image more salient by extensively covering the country's product in a trade dispute or product recall. Jointly, these factors will determine the shape and precision of the prior belief in a complex process. We remain relatively agnostic on the exact psychological process through which consumers obtain their prior beliefs about the group. However, we focus on the case in which a COO image is an accurate reflection of a country's overall product quality.[6] We make the following two assumptions about COO stereotype formation

$$M_g = \frac{N - \sum_i b_i}{N} M_{gb}, \tag{2}$$

$$\frac{S_g}{M_g} = \frac{\sum_i (1 - b_i) q_i}{\sum_i (1 - b_i)}. \tag{3}$$

Equations (2) and (3) introduce additional parameters and require some explanation. Let us start from Equation (2). Recall that b_i stands for firm i's decision to dissociate from group i. Therefore, $N - \sum_i b_i$ corresponds to the number of firms who do not mask their COO. Equation (2) essentially states that the precision of the COO stereotype decreases as more firms break away from group g. This reflects the reality that consumers have greater opportunities to interact with brands from country g when there are more brands from that country. Consequently, they are likely to hold a more precise belief about country g's COO. Therefore, when a subset of brands break away from COO g, M_g will decrease accordingly. For the purpose of our analysis, we specify a linear function, $M_g = (N - \sum_i b_i)(M_{gb}/N)$, where M_{gb} is the baseline precision of the COO prior when no firms break away from the stereotype. When no firm engages in COO dissociation $M_g = M_{gb}$. When all firms engage in COO dissociation $M_g = 0$.

Thus, M_{gb} is an exogenous parameter in the model while M_g is endogenously determined. Consequently, ρ as defined above, is also endogenously determined. Because we would like to present our equilibrium results in terms of ρ, which has a clear conceptual meaning, we introduce another exogenous parameter ρ_b. We define $\rho_b = M_{gb}/(M_{gb} + M_s)$ as a parameter that measures the consumers' baseline tendency to apply the COO stereotype, when no firm breaks away. The connection between ρ_b and ρ will be explained in the appendix.

We next explain the determination of S_g, which is described by Equation (3). Recall that q_i is the quality choice of firm i. Equation (3) states that given q_i, the mean of the group prior is a weighted average of the actual quality levels of the firms who do not break away from the COO identity. Put differently, the COO is unbiased in the sense that the COO mean equals the expected quality of a brand with which consumers will interact. A brand does not enter into the calculation of country g's COO image if it disguises its COO identity ($b_i = 1$).

In our formulation, the COO prior is defined by two parameters, i.e., the mean and the precision. Note that the COO prior distributions cannot be ranked in familiar orders such as stochastic dominance.[7] For example, in certain product categories, country A may have a less positive COO image than country B, but having less direct (e.g., product trial) and indirect (e.g., media coverage) experiences with products made in country A, consumers' prior belief about country A's COO image may also be less precise. As such, given the same amount of data, they may put less weight on the COO prior when judging the quality of a country A brand.

Note that in this model, we assume that each brand generates the same number of signals, denoted as M_s. In reality, each brand can generate a different number of signals M_{si}. When M_{si} is different for each firm i, consumers may apply a different ρ_i when judging each brand's quality. Similarly, Equation (3) should now be $S_g/M_g = \sum_{i,\, b_i=0} M_{si} q_i / \sum_{i,\, b_i=0} M_{si}$, reflecting the fact that consumers have different opportunities to interact with different brands; therefore, the quality of the brands carry different weights in the COO formation process.

When a firm increases M_{si}, it decreases the weight of the COO prior with which consumers learn about its quality. Put differently, by endogenizing M_{si}, we could study the firms' incentives to promote their brand awareness (i.e., generate more quality signals) as a way to counter the effect of a negative stereotype. This is a different mechanism from disguising one's COO identity. We discuss this in detail in §5 as an important direction for future research. Table 1 summarizes the definitions of the key parameters. Note that the parameters M_s, M_{gb}, ρ_{gb} are the only exogenous parameters in the model. We will present the equilibrium results in terms of these parameters.

COO Dissociation. In the first stage, each firm chooses whether to engage in COO dissociation. COO

[6] Indeed, our use of stereotype does not imply any cognitive bias or carry any negative connotation. As is often the case, producers from the same country may share similar cost structures, technical background or even similar work ethics. As such, their common COO does contain useful information about each firm's quality. We thank the reviewing team for helping us clarify these assumptions.

[7] We thank one of the reviewers for pointing out this fact.

dissociation creates uncertainty about a brand's COO. When firm i is successful in dissociating from its COO, it is perceived to be completely unrelated to country g. Consequently, consumers do not judge its brand by country g's COO stereotype, nor do they incorporate firm i's quality in the stereotype formation process for country g. Formally, instead of applying the group stereotype $Beta(S_g, M_g - S_g)$ to judge firm i's quality, consumers use an alternative, *exogenous* prior $Beta(S_0, M_0 - S_0)$ when updating their beliefs about brand i's quality. For example, $Beta(S_0, M_0 - S_0)$ could stand for the COO image of Italy when Chinese firms choose an Italian sounding name. For simplicity, we focus on the case wherein a firm can always dissociate itself from the group as long as it incurs the cost.[8] Specifically, denote $b_i \in \{0, 1\}$ as firm i's decision to engage in COO dissociation. Consumer prior is therefore $S(b_i) = (1 - b_i)S_g + b_i S_0$ and $M(b_i) = (1 - b_i)M_g + b_i M_0$.

As discussed in §1, firms who suffer from an inferior COO image follow a variety of strategies to mask their COO. The variables S_0 and M_0 may take different values depending on how exactly a firm disguises its COO. The variables We highlight one special case of $Beta(S_0, M_0 - S_0)$ that we will use as a continuous example in our analysis. Consider the special case in which M_0 is very small, such that $Beta(S_0, M_0 - S_0)$ is an uninformative prior. Roughly speaking, this could be the case where an emerging market brand i disguises its COO by choosing a neutral brand name, which is not associated with any particular foreign culture. As consumers become uncertain about this brand's COO, they do not apply the g stereotype to judge its quality. Moreover, since no specific COO is hinted at by the name, consumers cannot apply *any* specific COO stereotype to help them judge brand i's quality. Consequently, they judge brand i's quality by putting more weight on its own quality signals, S_{si} and M_s. In effect, ρ approximates 0 as firm i invests in COO dissociation.[9] Therefore, COO dissociation may not only induce a more positive image but also endogenously change the extent to which consumers rely on a brand's own performance data to judge its quality.

More broadly, we impose the following parameter restrictions for the purpose of the current analysis: $S_0/M_0 > S_g/M_g$ and $M_0 < M_g$. Together, these assumptions state that COO dissociation leads to a more favorable perception but also creates more uncertainty about a firm's COO. These assumptions are reasonable in the context of emerging market brands pretending to be from developed countries. As emerging market consumers typically have a better knowledge of domestic brands than global brands, their prior belief on group g tends to be more precise than their prior on group 0. Hence, $M_g > M_0$. This is particularly true in less developed parts of emerging markets. In the third and fourth tier cities of China, for example, consumers have great aspirations for global brands but their knowledge of a particular COO is very limited. The other assumption, $S_0/M_0 > S_g/M_g$, simply ensures that the brands do not want to be associated with COOs that have worse images compared with their home country.[10] We assume that firm i incurs cost c_b when it masks its COO. The parameter c_b may correspond to the cost of hiring a brand consulting agency, the cost of redesigning one's website, creating an ad with a foreign accent, or any other costs associated with managing a disguised COO identity.

The above parameter restrictions allow us to focus on the context wherein domestic brands from emerging markets pretend to be foreign brands. Technically, the model is tractable when the above inequalities are reversed. In the appendix, we replicate the analysis under the assumption $M_0 > M_g$. This is reminiscent of a case in which emerging market brands enter a developed market.

As a technical point, as Equations (2) and (3) suggest, since M_g and S_g endogenously depend on firm choices $\vec{q}$ and $\vec{b}$, the inequality $M_0 < M_g$ may flip when more firms break away from the stereotype. Put differently, emerging market consumers become uncertain about the quality image of their own COO, as too many firms now hide their COO. We believe this is not a very relevant case. Although COO dissociation may marginally lower the precision about country g's COO image, it is quite unlikely that this will reverse the $M_0 < M_g$ inequality. In the main analysis, we assume that $M_0 < M_g$ is satisfied in equilibrium and in all relevant subgames.

As COO dissociation masks a firm's COO identity, consumers do not incorporate this firm in the stereotype formation process. As such, they update the prior about group g based on all of the firms who do not mask their COO identity. The updated stereotype is determined as in Equations (2) and (3). In other words, we consider a simple model in which consumer belief about firm i's COO is malleable. A very important caveat applies to this modeling choice. Our

[8] We started by studying a general case where COO dissociation is only partially effective. With a certain probability, a consumer can still tell the firm i's COO even if it invests in COO dissociation. The analytical expressions become more complicated, but the intuition and results remain the same. We choose to present the simplest case to best illustrate the intuition.

[9] Note however, as long as $S_0 > 0$ and $M_0 > 0$, ρ is never exactly 0. To enable $\rho = 0$, we need to apply the Haldane prior $Beta(0, 0)$. The conceptual debate about improper priors is beyond the scope of this paper. We do use the Haldane prior for the current analysis.

[10] We are grateful to the review team who helped us clarify these assumptions.

formulation of COO dissociation by nature assumes bounded rational consumers. If consumers are perfectly rational, they should be able to infer the firms' tendencies to engage in COO dissociation. In this case, knowing that what appears to be a foreign brand can in fact be a domestic one, consumers may apply the g prior (with a certain probability) to judge a brand's quality even if the brand appears to be in the 0 group. This may reduce firms' incentives to invest in COO dissociation. We believe that bounded rationality should be a reasonable assumption. This is particularly likely to be true for emerging market consumers, whose sophistication is limited in the early development stages of these markets.

Quality Investment. COO dissociation serves to disassociate a brand from the (negative) stereotype. However, it does not have any real effect on a firm's quality and does not generate more positive signals S_{si}. The likelihood of observing a positive signal depends entirely on a firm's quality level, q_i. The probability that consumers observe S_{si} success out of M_s signals is $F(S_{si} \mid M_s, q_i) = \binom{M_s}{S_{si}} q_i^{S_{si}} (1-q_i)^{M_s - S_{si}}$. Firm i incurs quadratic cost $c_{qi} q_i^2$ to achieve quality q_i.

Conditional on observed quality signals, we assume that firm i's payoff is simply its perceived quality level, $E(q_i \mid S(b_i), M(b_i), S_{si}, M_s)$, minus the cost of quality investment and COO dissociation. Taking expectation over the quality signals S_{si}, M_s, we obtain firm i's expected payoff in the first stage

$$\begin{aligned}\Pi_i(q_i, b_i; \vec{q}_{-i}, \vec{b}_{-i}) &= \int E(q_i \mid S(b_i), M(b_i), S_{si}, M_s)\, dF(S_{si} \mid M_s, q_i) \\ &\quad - c_{qi} q_i^2 - c_b b_i, \end{aligned} \tag{4}$$

where $E(q_i \mid S(b_i), M(b_i), S_{si}, M_s)$ is defined in Equation (1), $S(b_i)$, $M(b_i)$, and $F(S_{si} \mid M_s, q_i)$ are defined as above. In the first stage, firm i chooses q_i and b_i to maximize the expected payoff. Finally, we introduce heterogeneity into firms' cost of quality investment, c_{qi}. This leads to dispersion in equilibrium quality levels and allows us to compare high and low quality firms' incentives to mask their COO. In our analysis, we do not impose specific functional form restrictions on the distribution of c_{qi}. We refer to the inverse of each firm's cost of quality, $1/c_{qi}$, as firm i's technical efficiency. As such, in this model, COO stereotype stems from the fact that firms from the same country have similar cost structures.

To summarize, we consider a model in which consumers use the group average as a prior for each individual firm's quality. They learn about each brand's quality based on the group prior as well as from this particular brand's quality signals. A firm can invest in quality to generate more favorable quality signals; they can also invest in COO dissociation that masks its COO identity. We are interested in understanding firms' equilibrium decisions and, in particular, the implication for the COO stereotype, $\Theta(\vec{q}, \vec{b}) = S_g(\vec{q}, \vec{b})/M_g(\vec{b})$.

4. Analysis

In this section, we attempt to present a set of propositions that are as general as possible. We do not impose further restrictions on the distribution of c_{qi} and $Beta(S_0, M_0 - S_0)$ in our lemmas and propositions. To sharpen the intuitions, however, we consider a running example that we discuss after every proposition. Specifically, we consider a case wherein $1/(2c_{qi})$ is equidistantly distributed on $[\mu - \delta, \mu + \delta]$.[11] In addition, we assume that COO dissociation creates maximal uncertainty about a firm's country of origin; consumers apply a diffuse prior when a firm masks its COO.[12] There are two key parameters in this running example, i.e., ρ_b and μ.[13] The parameter μ captures the median firm's technical efficiency. As μ increases, the firms can achieve higher product quality at a lower cost. ρ_b captures the extent to which consumers rely on the COO stereotype to judge a firm's quality. As explained above, ρ_b is the baseline stereotyping tendency when no firm breaks away from the stereotype.

Shared reputation may create a common good problem where firms do not fully internalize the benefits of quality investment. Put differently, it is exactly because of the consumers' tendencies to stereotype that each firm finds it profitable to free-ride on other firms' efforts. This lack of incentives to improve quality, in turn, leads to a negative COO stereotype. We first provide a benchmark result that formalizes this intuition. Consider a scenario in which none of the firms engage in COO dissociation. Proposition 1 describes firms' equilibrium quality choices.

Proposition 1. *Rank the firms according to* $1/(2c_{qi})$, *such that* $i = 1$ *is the most efficient firm. Consider a case wherein no firm engages in COO dissociation. The equilibrium quality choice for firm* i *is*: $q_i^* = \min\{(1 - \rho_b + \rho_b/N)(1/(2c_{qi})), 1\}$. *Firms underinvest by a larger margin when* ρ_b *is higher and* N *is larger.*

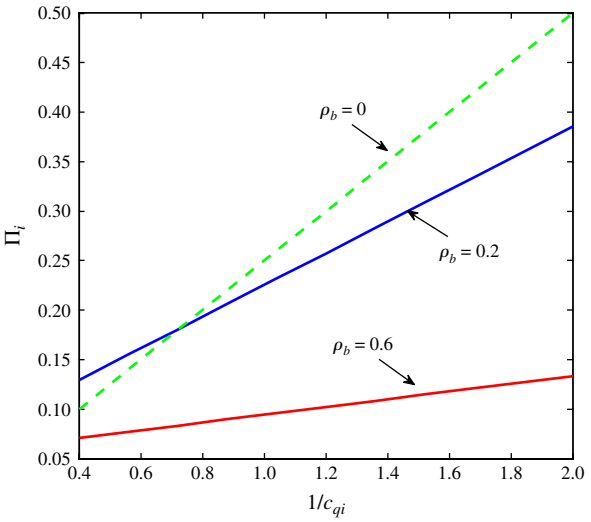
Proposition 1 echoes the insight from the public good literature, i.e., when firms enjoy a shared reputation they suffer from a free-riding problem that leads

[11] Under quadratic cost, the equilibrium quality choice is proportional to $1/c_{qi}$. This cost distribution yields equilibrium quality choices that have nice analytical properties.

[12] We use the Haldane prior $S_0 = M_0 = 0$.

[13] For simplicity, we fix M_s and present most of our results in terms of ρ_b. Thus there is a one-to-one correspondence between M_{gb} and ρ_b in our analysis.

Figure 1 **(Color online) Shared Reputation May Hurt Both High and Low Quality Firms**



to underinvestment in quality. When consumers judge the brands based on their shared COO, a high quality firm incurs positive spillover on the other firms. As such, each firm cannot fully internalize the benefit of quality investment, and the equilibrium quality choices are lower compared with the socially efficient level, $1/(2c_{qi})$.[14] As expected, the extent of free-riding is most accentuated when group size is large and when consumers have a strong tendency to rely on the COO stereotype to judge individual brands' quality.

Consumers' tendency to engage in COO stereotyping clearly hurts the high quality firms. However, the public good problem may create so much inefficiency that even the lowest quality firms can become *worse off* when free-riding opportunity *increases*. Figure 1 illustrates a case of 20 firms and $1/(2c_i)$ is equidistantly distributed on $[0.2, 1]$. The horizontal axis represents $1/c_i$ where the vertical axis represents the firm's equilibrium payoff, which corresponds to $\Pi_i = \rho_b(\sum_{k=1,\ldots,N} q_k^*/N) + (1-\rho_b)q_i^* - c_{qi}q_i^{*2}$.

Figure 1 compares firm payoffs under three different levels of stereotyping. The firms are indexed by their technical efficiency $1/c_{qi}$ along the horizontal axis. Consumers put a larger weight on the COO prior when ρ_b is larger. As can be seen, when consumers' tendency to apply the COO stereotype is mild ($\rho_b = 0.2$), low quality firms become better off compared with the no-stereotyping benchmark ($\rho_b = 0$), benefiting from the possibility of free-riding. High quality firms, as expected, become worse off. When $\rho_b = 0.6$, however, the public good problem diminishes firms' quality investment incentives to such an extent that *both* high quality and low quality firms are worse off, as measured by the difference between the $\rho_b = 0$ curve and the $\rho_b = 0.6$ curve.

When COO dissociation is not too costly, it represents a clear benefit for high quality firms who attempt to do so.[15] When a firm succeeds in disassociating itself from the group, its perceived quality is no longer weighted down by the group prior. Interestingly, as high quality firms dissociate themselves from their COO, the impact on the COO image is ambiguous. Proposition 2 considers a case in which an exogenous number of firms, N_b, disguise their COO identity. It states wherein high quality firms break away from the group, it may hurt or benefit the group stereotype.

Proposition 2. *Rank the firms according to* $1/c_{qi}$, *such that* $i = 1$ *is the most efficient firm. Consider a case in which the top* N_b *firms engage in COO dissociation. Each firm chooses its quality level conditional on the COO dissociation decisions. Define* $q_i^*(N_b)$ *as the optimal quality choice of firm i when the top* N_b *firms break away. The equilibrium COO stereotype* $\Theta(\vec{q}, \vec{b})$ *can be re-parameterized as* $\Theta(\vec{q}^*(N_b), N_b)$, *which has the following properties*:

- $\Theta(\vec{q}^*(N_b), N_b + 1)/\Theta(\vec{q}^*(N_b), N_b) \le 1$.
- $\forall\, i > N_b + 1$, $q_i^*(N_b + 1)/q_i^*(N_b) \ge 1$.

Put differently, high quality firms' COO dissociation decision has a negative direct effect and a positive strategic effect on the group stereotype.

Proposition 2 states that high quality firms' COO dissociation decision has two effects on the equilibrium group stereotype. First, keeping quality choices constant, group stereotype deteriorates as high quality firms mask their COO. When a high quality firm hides its COO identity, it ceases to contribute to the group reputation, leading to a negative direct effect on the COO stereotype. Interestingly, however, COO dissociation has a positive strategic effect on the group image. The intuition is as follows: As a brand disconnects itself from the group, it prevents the other brands from free-riding on itself. When more high quality firms break away from the group, the remaining firms have stronger incentives to improve their own qualities. As such, $q_i^*(N_b + 1) \ge q_i^*(N_b)$ for $\forall\, i > N_b + 1$. Since $\partial\Theta(\vec{q}^*, N_b)/\partial q_i^* > 0$, it follows that COO dissociation has a positive strategic effect on the COO stereotype.

The overall effect of COO dissociation on equilibrium stereotype depends on the relative magnitudes of the direct effect and the strategic effect. Broadly speaking, the strategic effect becomes less prominent

[14] Note that since we interpret "quality" as the probability with which a product will generate a positive experience, q_i^* is bounded between $[0, 1]$. Our key insights are not driven by this assumption.

[15] In Proposition 4, we show that high quality firms indeed have stronger incentives to invest in COO dissociation when $S_0/M_0 > S_g/M_g$ and $M_0 < M_g$.

when the free-riding problem is less severe. Specifically, when ρ_b is low, the strategic effect is dominated by the direct effect. Therefore, group image deteriorates as more firms break away from the group. When ρ_b is high, however, the strategic effect dominates the direct effect. The group image can in fact *improve* as more high quality firms disassociate themselves from the group. Proposition 3 presents this comparative static result. To better sharpen the intuitions, Corollary 1 outlines the exact conditions in our running example.

Proposition 3. *Regardless of the distribution of c_{qi}, given N, N_b, the strategic effect is* (*weakly*) *increasing in ρ_b; the direct effect is* (*weakly*) *decreasing in ρ_b.*

Corollary 1. *Consider the case wherein $1/(2c_{qi})$ is equidistantly distributed on $[\mu-\delta, \mu+\delta]$, and the quality choice of each firm has an interior solution. The strategic effect is $q_i^*(N_b+1)/q_i^*(N_b) = \rho_b/(N-\rho_b(N_b+1))+1$. The direct effect is $\Theta(\vec{q}^*(N_b), N_b+1)/\Theta(\vec{q}^*(N_b), N_b) = 1-\delta/(N\mu - N_b\delta)$. Overall, when $\rho_b > \delta/\mu$, the COO stereotype improves as more firms break away from the stereotype.*[16]

The intuition for Proposition 3 is as follows: The strategic effect refers to the fact that as more firms break away from the COO stereotype, free-riding is alleviated and quality investment increases. The strategic effect is increasing in ρ_b and is null (e.g., $q_i^*(N_b+1)/q_i^*(N_b)=1$) when $\rho_b = 0$. This is because, when $\rho_b = 0$, consumers attach very little weight to the COO prior and full weight to each firm's individual quality signals. As such, free-riding is not a problem from the beginning and each firm chooses the efficient quality investment level, regardless of how many firms break away from their COO identity. Thus, the strategic effect is minimal since quality decisions do not depend on N_b. When ρ_b is large, free-riding becomes an increasingly serious problem, and the strategic effect becomes proportionally larger. Corollary 1 presents the special case wherein $1/(2c_{qi})$ is uniformly distributed. The strategic effect is $q_i^*(N_b+1)/q_i^*(N_b) = \rho_b/(N-\rho_b(N_b+1))+1$, which is clearly increasing in ρ_b.

In contrast, the direct effect simply depends on the arithmetic difference between the c_{qi} of a firm who breaks away and that of the rest who stay with their COO identity. As we will show in the appendix, when the quality investment games have interior solutions, the direct effect is simply $((N-N_b)\sum_{i=N_b+2,\ldots,N}(1/(2c_{qi})))/((N-N_b-1)\cdot\sum_{i=N_b+1,\ldots,N}(1/(2c_{qi})))$, and is invariant in ρ_b. As Corollary 1 states, this ratio corresponds to $1-\delta/(N\mu-N_b\delta)$ when $1/(2c_{qi})$ is uniformly distributed. Put together, we can derive the conditions under which COO stereotype improves as more firms break away from it. In the running example, this condition comes down to $\rho_b > \delta/\mu$. The boundary is δ/μ, which increases as firms have more heterogeneous costs. This is intuitive since the direct effect is more pronounced when quality variance is large.[17] Figure 2 illustrates the insight for five firms with $1/(2c_{qi})$ equidistantly distributed on $[0.5, 1]$.

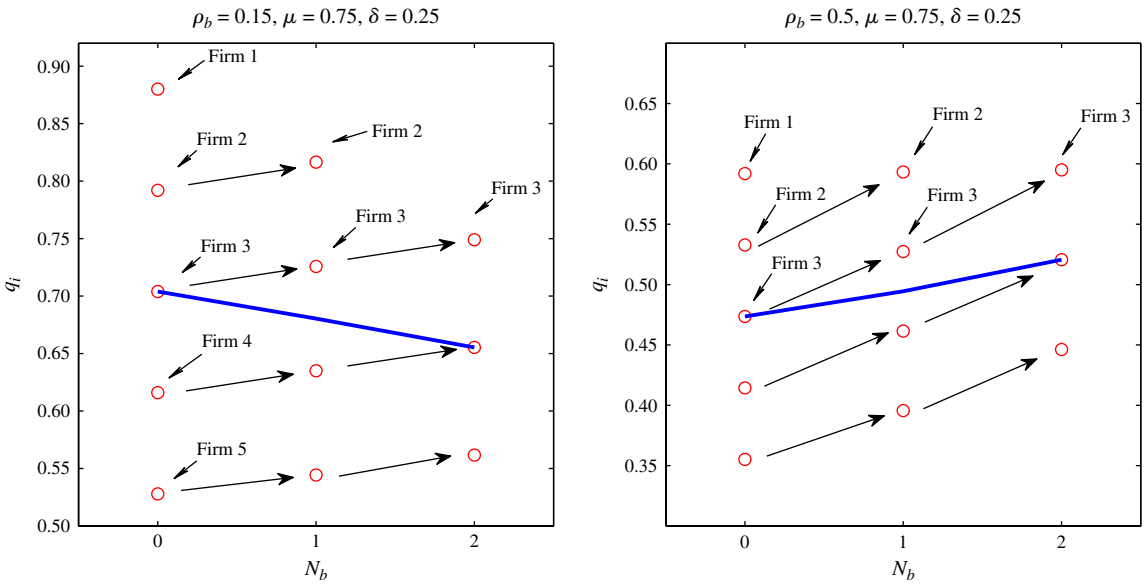
In Figure 2, we plot $\Theta(\vec{q}^*(N_b), N_b)$ and q_i^* as functions of N_b. Each dot represents the equilibrium quality choice q_i^* of a corresponding firm. The solid curve represents equilibrium stereotype $\Theta(\vec{q}^*(N_b), N_b) = S_g(\vec{q}^*(N_b), N_b)/M_g(N_b)$ as a function of N_b. To illustrate the idea of breaking away, the figures omit the top N_b firms who mask their COO identities. Thus, for each N_b, the figures show q_i^* for $i = N_{b+1}, \ldots, N$. The left panel corresponds to the case $\rho_b = 0.15$ wherein the consumers do not have strong tendencies to rely on the COO stereotype. As can be seen, when firm $i=1$ disassociates itself from the group, the new stereotype is based on firms $i=2,\ldots,5$ who are less efficient compared with firm 1. This implies a negative direct effect. However, firms $i=2,\ldots,5$ now have stronger incentives to invest in quality, as they can no longer free-ride on $i=1$'s quality investment. Thus, q_i^* increases for each of the remaining firms, as indicated by the upward tilting arrows in Figure 2. However, under $\rho_b = 0.15$, the strategic effect is not strong enough to compensate for the direct effect. Consequently, group stereotype deteriorates as more firms engage in COO dissociation. When $\rho_b = 0.5$, however, the strategic effect dominates. Collectively, the firms improve their quality to such an extent that COO stereotype *improves* although the highest quality firms break away from the group.

Suppose a central planner has the option of banning firms from disguising their COO. Is this a good strategy to follow? While we treat N_b as an exogenous parameter in Propositions 2 and 3, the main insights also hold in an equilibrium framework. Proposition 3 and Corollary 1 imply that, somewhat counterintuitively, banning the high quality firms from engaging in COO dissociation can in fact hurt the COO image.

[16] This result applies to the case wherein interior solutions exist for the quality investment games. Relaxing this assumption will not make the game intractable, but the boundary condition can only be defined implicitly. In fact we do not impose this restriction in the main analysis.

[17] Note also that Proposition 3 speaks to the effect of breaking away on equilibrium stereotype, not on equilibrium profit. When ρ_b is small, for example, the strategic effect is limited, and the stereotype decreases as more firms break away. Yet profits do not decrease as much since consumers put relatively little weight on COO prior when they make a quality judgment.

Figure 2 **(Color online) "Breaking Away" May Hurt or Improve COO Image**



Propositions 2 and 3 shed light on the marginal impact as high quality brands break away from the group stereotype. We next endogenize both COO dissociation and quality decisions in an equilibrium framework. To best illustrate the intuition, we first present two lemmas that discuss how firms' incentives to engage in COO dissociation vary with the key parameters. Specifically, we define $\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i}) = \Pi_i(q_i, 1; \vec{q}_{-i}, \vec{b}_{-i}) - \Pi_i(q_i, 0; \vec{q}_{-i}, \vec{b}_{-i})$ as firm i's incentive to engage in COO dissociation, conditional on its quality choice q_i and every other firm's decisions. Lemma 1 states the first result.[18]

Lemma 1. *Fix M_s such that ρ_b corresponds to M_{gb} one-to-one. $\forall\, q_i > \Theta(\vec{q}, \vec{b})$, $\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})$ is larger under larger ρ_b. Put differently, firms have stronger incentives to invest in COO dissociation when consumers have a stronger tendency to apply the COO stereotype.*

In general, holding $\vec{q}$ and $\vec{b}_{-i}$ constant, firm i is more likely to engage in COO dissociation when consumers have stronger tendencies to revert to the COO stereotype to judge a brand's quality. Consequently, high quality firms have stronger incentives to break away from the stereotype. This result is not very surprising. In a second lemma, we examine how equilibrium quality levels $\vec{q}$ affect firm i's incentive to engage in COO dissociation. Does COO dissociation become more prevalent as firms gain greater efficiency in improving product quality? Lemma 2 states the basic insight.

Lemma 2. *Given $\vec{b}$, $\vec{q}$, $\forall\, q_i > \Theta(\vec{q}, \vec{b})$,*

- *$\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})$ is increasing in q_i as long as N and $N - N_b$ are not too small, such that $M_0 < M_g((N - N_b - 1)/(N - N_b))(N(1-\rho_b)/(N(1-\rho_b) + \rho_b))$. Otherwise, $\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})$ is decreasing in q_i.*
- *$\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})$ is decreasing in q_k, $k \neq i$.*

As such, when c_{qi} decreases for every i, the equilibrium number of firms who engage in COO dissociation may increase or decrease.

Lemma 2 states that, as expected, a firm's incentive to break away from the stereotype is increasing in its own quality as long as $N - N_b$ is not too small. Note that we assumed $M_0 < M_g$ in the baseline model and that $\rho_b \leq 1$ by construction. Thus the condition in Lemma 2 is satisfied as long as $((N - N_b - 1)/(N - N_b))(N(1-\rho_b)/(N(1-\rho_b)) + \rho_b)$ is close to 1, which is the case for large enough $N - N_b$.

However, as other firms improve their qualities, firm i's incentive to engage in COO dissociation decreases. The intuition is as follows: As COO dissociation separates a firm from the rest of the group, its benefit is largest when most other firms from the same country have low quality. As firms $k \neq i$ attain higher quality, the COO stereotype improves and the need for breaking away is diminished. This insight has interesting implications for the prevalence of COO dissociation when firms *collectively* make progress in technical efficiency.

To illustrate the idea, consider our running example wherein $1/(2c_{qi})$ is equidistantly distributed on $[\mu - \delta, \mu + \delta]$. When δ is fixed, the parameter μ, i.e., the

[18] Note that in the most general case, Γ_i cannot be uniquely determined by ρ_b. However, since ρ_b, bounded between 0 and 1, is conceptually clear for presentation purposes, we present the results in terms of ρ_b whenever possible by fixing M_s, such that ρ_b corresponds to M_{gb} one-to-one.

Figure 3 **(Color online) Prevalence of COO Dissociation as Firms Improve in Quality**

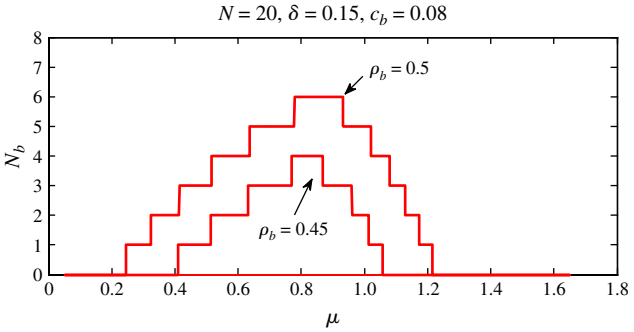
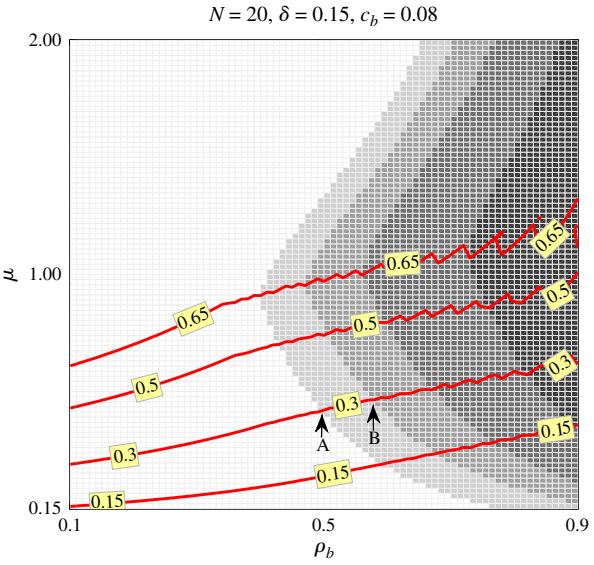


Figure 4 **(Color online) Equilibrium Quality Choice and COO Dissociation**



inverse of the median $2c_{qi}$, measures the firms' capability to produce high quality products. As emerging market firms collectively catch up in technological or managerial skills, c_{qi} will decrease across the board. This collective progress can be approximated with an increase in μ, while holding c_b as a constant. Figure 3 illustrates the impact of higher μ on the prevalence of COO dissociation. It depicts equilibrium N_b^* as a function of μ. As μ increases, firms collectively gain higher technical efficiency. Interestingly, the equilibrium number of firms who engage in COO dissociation follows an inverted-U shaped curve. When μ is very low, most firms are only capable of producing low quality products. Their profits are low regardless of whether they break away from the stereotype, making costly COO dissociation an unprofitable proposition. As μ improves, more firms become capable of achieving high quality and can afford the cost of breaking away from the group stereotype. This effect enables more firms to engage in COO dissociation. However, when μ further increases, the stereotype eventually improves to such a point that the gain from breaking away starts to decrease. This points to an interesting, nonmonotonic relationship between firms' collective technical efficiency (μ) and the prevalence of COO dissociation (N_b^*). As expected, N_b^* is smaller at every μ for smaller ρ_b, reflecting the insight from Lemma 1.

Note that the exact relationship between N_b^* and c_{qi}'s depends on the distributional assumptions about c_{qi}. We replicated the analysis under a number of other cost distributions as well by relaxing the assumption that q is bounded on $[0, 1]$. While N_b^* does not always follow an inverted-U shape curve, it is a rather robust result that N_b^* can increase or decrease as c_{qi}'s decrease.

Lemmas 1 and 2 shed some light on the strategic rationale behind COO dissociation. Together with Propositions 2 and 3, they suggest an interesting interaction between COO dissociation and quality investment. Building on these insights, we next investigate the equilibrium outcome in the first stage, when firms choose q_i and b_i jointly. Proposition 4 states the result.

Proposition 4. *Rank the firms according to $1/c_{qi}$, such that $i = 1$ has the lowest cost. Define ρ_b as before and $\rho_b' = M_0/(M_s + M_0)$. In a pure strategy equilibrium, the top N_b^* firms invest in COO dissociation: $b_i^* = 1$ iff $i \le N_b^*$. The equilibrium quality choices are: $q_i^* = \min\{1, (1 - (N - N_b - 1)\rho_b/(N - \rho_b N_b))(1/(2c_{qi}))\}$ for $i > N_b^*$; $q_i^* = \min\{1, (1 - \rho_b')(1/(2c_{qi}))\}$ for $i \le N_b^*$. An implicit definition of N_b^* is given in the appendix.*

Proposition 4 states that, *regardless of the distribution of c_{qi}*, firms' equilibrium COO dissociation decisions can be characterized by a threshold N_b^*. The N_b^* most efficient firms will break away from the group. The other firms do not disguise their COO. The firms who break away from the stereotype have greater incentives to invest in quality. While this is a general result, the exact conditions for N_b^* depend on the distribution of c_{qi}. To clarify the intuitions, let us consider our running example in which $Beta(S_0, M_0 - S_0)$ corresponds to the flat prior, and $1/(2c_{qi})$'s are equidistantly distributed on $[\mu - \delta, \mu + \delta]$. Figure 4 describes the equilibrium outcomes in the parameter space (ρ_b, μ); δ is fixed to 0.15.

Figure 4 depicts N_b^* with varying shades on a grayscale. A darker area corresponds to equilibria with higher N_b^*, i.e., COO dissociation is more prevalent. The lighter area represents equilibria in which fewer firms mask their COO identity.[19] A set of "iso-stereotype" curves are superimposed on the graph, which we explain in the next paragraph. A few insights are evident from Figure 4. First, note that the equilibrium pattern of N_b^* is consistent with the intuition laid out in Lemmas 1 and 2. Consistent with

[19] We discretized the range of N_b^* into a five-level grayscale.

the intuition in Lemma 1, COO dissociation is most prevalent when consumers have strong tendencies to stereotype (i.e., ρ_b is high). As ρ_b increases, N_b^* monotonically increases. Consistent with Lemma 2, as firms collectively make progress in quality (i.e., μ is higher), the prevalence of COO dissociation may first increase then decrease. In Figure 4, for any given ρ_b, N_b^* follows an inverted-U shaped relationship in μ. Overall, COO dissociation is most prevalent for large ρ_b and intermediate μ. None of the firms practice COO dissociation ($N_b^* = 0$) for sufficiently small ρ_b, and either sufficiently small *or* large μ.

A second insight concerns the equilibrium COO image, $\Theta^*(\vec{q}, \vec{b})$, which corresponds to the mean of the COO prior.[20] Figure 4 presents four "iso-stereotype" curves in the parameter space. Each iso-stereotype curve corresponds to a set of (ρ_b, μ) values under which the equilibrium COO image, $\Theta^*(\vec{q}, \vec{b}) = S_g/M_g$, are identical. The labels on top of each iso-stereotype curve denote the value of $\Theta^*(\vec{q}, \vec{b})$ under that set of parameters.

Examining these iso-stereotype curves, several interesting insights emerge. First, broadly speaking, equilibrium COO image is more favorable for lower ρ_b or higher μ.[21] Put differently, the country's quality image improves as firms gain greater technical efficiency ($\mu \uparrow$) *or* as consumers rely less on the COO stereotype to judge the brands ($\rho_b \downarrow$). Second, an iso-stereotype curve typically spans different equilibria with varying levels of N_b^*. For example, consider the iso-stereotype curve with $S_g^*/M_g^* = 0.3$. At point A, $(\rho_b, \mu) \approx (0.49, 0.53)$, four firms engage in COO dissociation and the remaining firms achieve an average quality of $S_g^*/M_g^* = 0.3$. At point B, $(\rho_b, \mu) \approx (0.58, 0.58)$, seven firms engage in COO dissociation, and the firms collectively achieve a COO image of $S_g^*/M_g^* = 0.3$ as well. Relatively speaking, point B represents a case in which firms' collective technical efficiency is high, but consumers have strong tendencies to stereotype. As a consequence, a larger number of high quality firms break away from the COO identity. In comparison, point A represents a case wherein firms' technical efficiency is slightly lower, but consumers rely less on the COO stereotype to judge each brand's quality. In equilibrium, firms do not have strong incentives to disguise their COO and they achieve the same level of average quality. In general, the iso-stereotype curves tend to be upward sloping, as depicted in Figure 4.

5. Discussion

This paper studies a curious phenomenon that is widely observed in many emerging markets. Many emerging market consumers hold pronounced COO preferences for western and global brands. In response, local brands from emerging markets pursue a variety of measures to pretend to be foreign. We study the strategic implications of this phenomenon, focusing on the antecedents and consequences of breaking free of a stereotype.

Our analysis illustrates the public good problem when consumers apply the COO stereotype to judge the firms' quality. Firms cannot fully internalize the benefit of quality investment, which leads to insufficient product qualities that fulfill a negative COO stereotype. As such, high quality firms have incentives to dissociate from their COO identity. Interestingly, as high quality firms break away, the free-riding problem is alleviated, leading to a higher quality investment by the rest of the firms. Overall, high quality firms' COO dissociation may hurt or benefit the equilibrium COO image. We also show that as firms collectively make progress in quality, the prevalence of COO dissociation can first increase then decrease.

We highlight one potential direction for future research. The current analysis does not address the scenario in which firms can endogenously invest in M_{si} and generate more quality signals on their own. Recall that in our formulation of the COO effect, the group stereotype affects the individual brands by serving as a prior. When consumers do not make inference from M_{si}, roughly put, the weight she puts on the prior is determined by the following parameter:

$$\rho_i = \frac{M_g}{M_g + M_{si}}.$$

A high quality firm certainly has incentives to decrease ρ_i such that it is less affected by the group stereotype. This can be achieved by a *decrease in* M_g or an *increase in* M_{si}. In this paper, we focused on the possibility that firm i can *decrease* M_g by disguising its COO, for example, by choosing a brand name that does not evoke a particular COO association. The other approach is to *increase* M_{si}, which will also decrease ρ_i. Put differently, a firm can break free of a stereotype by building its brand. A high quality firm i can, for example, invest in marketing campaigns that focus on the uniqueness of its individual brand. As such, consumers realize that firm i is different from other brands from country g.[22]

[20] COO stereotype is the main focus of this paper, but we can also investigate equilibrium firm surplus, by calculating the total payoffs accrued to all of the firms. This is also a meaningful measure since it takes into account both the firms who break away from the group and the firms who remain in the group. It turns out that in our example, the "iso-welfare" curves follow largely the same pattern. Firm welfare is increasing in μ and decreasing in ρ_b.

[21] Some anomalies may occur since "breaking free" is a discrete decision. This is technically possible but conceptually not very interesting.

[22] We thank one anonymous reviewer for this suggestion.

We believe that this represents a very different but equally interesting research question. While COO dissociation is a fairly unique and interesting phenomenon in many emerging markets, brand building definitely has more general appeal. We discuss some tentative conjectures on what would happen in a model with endogenous M_{si}. First, when consumers do not make inferences based on M_{si}, it is easy to see that a firm's incentive to increase M_{si} is quite similar to its incentive to decrease M_g, since both actions are equivalent in the sense that they decrease ρ_i, which is the only parameter that affects the profit function.

However, when consumers are fully Bayesian, as a firm increases M_{si}, its impact on the posterior belief is quite different. When firms are heterogeneous in terms of M_{si}, Bayesian consumers should infer the product qualities based on three pieces of information, i.e., the quality signals each firm generates, the firm's country of origin identity, and the firm's brand awareness M_{si}. Put differently, the consumers no longer apply a single, overarching stereotype to all firms from group g. When we allow two levels of M_{si} in the model, for instance, there should exist a separating equilibrium in which only firms whose quality is above a certain level invest in their brand awareness. Consumers may apply two different stereotypes to brands with a high level of awareness and brands with a low level of awareness. Free-riding occurs within each subgroup, i.e., among the firms who have the same M_{si}, respectively. A formal analysis of this model should be left to future analysis.

The duality of brands and COO stereotypes and the important question of brand building has general appeal for firms from developed markets and emerging markets alike. For example, for Italian shoes and French wines a positive stereotype is established among the firms. In this case, the firms conceivably have no incentives to disguise their COO, but brand building is still attractive especially for the firms who enjoy the highest quality. We believe that further analyses along these lines can be a very interesting research direction.

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Appendix A. $M_0 > M_g$

In this section, we reverse a central assumption in the baseline model that, $M_0 < M_g$. Recall that M_g stands for the precision of the COO stereotype of the focal country, while M_0 stands for the precision of the alternative COO prior. We believe that this is a reasonable assumption since emerging market consumers conceivably have more precise knowledge about the local firms. Their COO knowledge about foreign firms are more positive but less precise.

In this section, we explore what would happen when $M_0 > M_g$. This may correspond to a case in which emerging market firms enter *a developed market*.[23] As we will show shortly, reversing the assumption $M_0 < M_g$ changes some of the key insights in the baseline model while preserving the others. We will put the differences in perspective. Throughout the analysis, we keep the other model elements unchanged. As is clear, when firms do not invest in COO dissociation, the equilibrium quality choices are identical to that in the baseline model. Lemma A.1 discusses the firms' incentives to invest in COO dissociation.

Lemma A.1. *When $M_0 > M_g$ and $S_0/M_0 > S_g(\vec{q}, \vec{b})/M_g(\vec{b})$, the firms with higher c_{qi} have stronger incentives to invest in COO dissociation.*

Lemma A.1 states that, as expected, when $M_0 > M_g$, the high cost (i.e., low quality) firms have stronger incentives to engage in COO dissociation. This happens because COO dissociation not only increases the mean of the prior but also lowers the weight consumers put on firm i's individual quality signals. While high quality and low quality firms equally benefit from a higher prior mean, it is the low quality firms who benefit the most from a lower weight on the quality signals. Moreover, a firm *lowers* its quality investment when it disguises its COO. Therefore, given any distribution of c_{qi}, an equilibrium of the game is characterized by N_b such that the N_b least efficient firms engage in COO dissociation. Proposition A.1 echoes Proposition 2 in the baseline model, and states the impact of COO dissociation on equilibrium stereotype.

Proposition A.1. *Rank the firms according to $1/c_{qi}$, such that $i = 1$ is the most efficient firm. Consider a case in which the bottom N_b firms engage in COO dissociation. The equilibrium COO stereotype $\Theta(\vec{q}^*, \vec{b}^*)$ can be re-parameterized as $\Theta(\vec{q}^*(N_b), N_b)$, which has the following properties*:

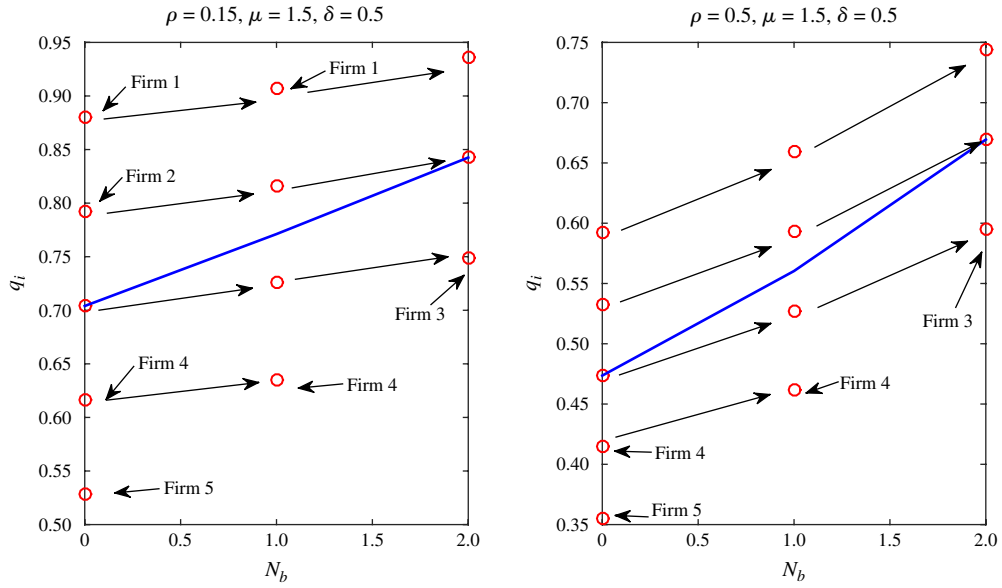
- $\Theta(\vec{q}^*(N_b), N_b + 1)/\Theta(\vec{q}^*(N_b), N_b) \geq 1$.
- $\forall\, i < N - N_b - 1$, $q_i^*(N_b + 1)/q_i^*(N_b) \geq 1$.

Put differently, low quality firms' COO dissociation effort has a positive direct effect and a positive strategic effect on the group stereotype.

Proposition A.1 examines the impact of COO dissociation on equilibrium stereotype by comparing subgames with differing levels of N_b. As expected, when low quality firms are the first to break away from the stereotype, they incur a positive direct effect on the group stereotype. Moreover, the strategic effect remains positive. This is because the extent of free-riding depends only on consumers' tendency to stereotype and the number of firms who share the group image. As such, when low quality firms break away from the group, high quality firms also gain additional incentives to improve their qualities. Figure A.1 mirrors Figure 2 in the

[23] We thank the review team for making this suggestion.

Figure A.1 **(Color online) When $M_0 > M_g$**



baseline model. Overall, COO stereotype always improves as low quality firms break away from the stereotype. Under higher ρ_b, the increase (in terms of ratio) is faster due to a stronger strategic effect.

More broadly, Propositions 2 and A.1 describe the scenarios in which high or low quality firms are the first to break away from the stereotype. In reality, many factors other than M_0 and M_g may determine whether the high or low quality firms have stronger incentives to disguise their COO. For example, high quality firms may also have more marketing resources (e.g., better foreign language proficiency) to disguise their COO, for example, by choosing a foreign sounding name. Low quality firms may lack the knowledge to do so. In this case, the high quality firms will be the first to break away from the stereotype even if $M_0 > M_g$. The equilibrium of such a game will resemble what is described in Proposition 2.

Appendix B. Proofs for Propositions

Connection Between ρ and ρ_b. To help clarify the proof, we first explain the connections between these two parameters. ρ measures the consumers' tendency to stereotype when judging a firm's quality. It is defined as $M_g/(M_g+M_s)$. Since M_g is in fact a function of $\vec{b}$, $M_g = (N-\sum_i b_i)(M_{gb}/N)$, ρ is determined endogenously in the game.

ρ_b is an exogenous parameter in the model, defined as $\rho_b = M_{gb}/(M_{gb}+M_s)$. Thus, we can derive ρ as a function of ρ_b. Specifically, note that $M_{gb} = \rho_b M_s/(1-\rho_b)$. Thus, $M_g = (N-\sum_i b_i)(\rho_b M_s/((1-\rho_b)N)) = (N-N_b)(\rho_b M_s/((1-\rho_b)N))$. Plug this into $\rho = M_g/(M_g+M_s)$, we obtain that $\rho = (N-N_b)\rho_b/(N-N_b\rho_b)$.

Clearly, when more firms in group g break away, M_g decreases accordingly; so does ρ. While ρ_b is a good measure of consumers' tendency to rely on the COO stereotype, the exact weight they put on the prior depends on the number of firms who disassociate from the COO, N_b.

Proof of Proposition 1. When no firm invests in COO dissociation, we have $\rho = \rho_b$. The equilibrium stereotype is $\sum_{i=1}^N q_i/N$. When each firm offers a Bernoulli product with success probability q_i, the expected payoff to firm i is

$$\Pi_i(q_i, 0; \vec{q}_{-i}, \vec{0}) = (1-\rho_b)q_i + \rho_b \frac{\sum_{i=1}^N q_i}{N} - c_{qi}q_i^2. \qquad \text{(B1)}$$

Since $(\partial(-c_{qi}q_i^2)/\partial q_i)|_{q_i=0} = 0$, the optimal quality level is greater than zero. The first order condition $\partial\Pi_i(q_i, 0; \vec{q}_{-i}, \vec{0})/\partial q_i = 0$ is met when $q_i = (1-\rho_b+\rho_b/N)(1/(2c_{qi}))$. Since $q_i \in [0,1]$ for a Bernoulli product, equilibrium quality level is $q_i^* = \min\{(1-\rho_b+\rho_b/N)(1/(2c_{qi})), 1\}$. We have $q_i^* = 1$ when c_{qi} is sufficiently low. □

Proof of Proposition 2. In the proof for Proposition 4, we show that given any $\vec{q}$ and $\vec{b}$, high quality firms indeed have stronger incentives to invest in COO dissociation. Here we consider a subgame in which the top N_b firms break away from the stereotype. The firms that do not break away from the stereotype optimize the following profit function:

$$\Pi_i(q_i, 0; \vec{q}_{-i}, N_b) = (1-\rho)q_i + \rho \frac{\sum_{i=N_b+1}^N q_i}{N-N_b} - c_{qi}q_i^2, \qquad \text{(B2)}$$

where $\rho = (N-N_b)\rho_b/(N-N_b\rho_b)$. The optimal quality level is therefore $q_i^*(N_b) = \min\{1, ((N-\rho_b(N-1))/(N-N_b\rho_b)) \cdot (1/(2c_{qi}))\}$. Clearly for all i, $q_i^*(N_b)$ is (weakly) increasing in N_b, proving the second part of Proposition 2.

To prove the first part of Proposition 2, note that $\Theta(\vec{q}^*(N_b), N_b') = \sum_{N_b'+1}^N q_i^*(N_b)/(N-N_b')$. In addition, $q_i^*(N_b)$ is decreasing in i. Therefore, $\sum_{N_b+1}^N q_i^*(N_b)/(N-N_b) \geq \sum_{N_b+2}^N q_i^*(N_b)/(N-N_b-1)$, with the inequality being strict when interior solution exists in the quality investment games at least for some firms. This proves the first part of Proposition 2. □

Proof of Proposition 3. From the proof for Proposition 2, it is clear that $q_i^*(N_b+1)/q_i^*(N_b) = 1+\rho_b/(N-(N_b+1)\rho_b)$ when $q_i^*(N_b+1) < 1$ and $q_i^*(N_b) < 1$. This ratio

is increasing in ρ_b. Therefore, the strategic effect is *strictly* increasing in ρ_b when interior solutions exist for the quality investment game. The same holds true when we consider corner solutions. When $q_i^*(N_b+1)=1$ and $q_i^*(N_b)<1$, $q_i^*(N_b+1)/q_i^*(N_b)=1/q_i^*(N_b)$, which also increases in ρ_b since $q_i^*(N_b)$ is a decreasing function of ρ_b. When $q_i^*(N_b+1)=q_i^*(N_b)=1$, the ratio is a constant.

From Proposition 2, the direct effect is $\Theta(\vec{q}^*(N_b), N_b+1)/\Theta(\vec{q}^*(N_b), N_b) = ((N-N_b)\sum_{N_b+2}^{N} q_i^*(N_b))/((N-N_b-1)\cdot\sum_{N_b+1}^{N} q_i^*(N_b)) < 1$. When for all j, $q_j^*(N_b)=((N-\rho_b(N-1))/(N-N_b\rho_b))(1/(2c_{qi}))$, the direct effect is

$$\frac{\Theta(\vec{q}^*(N_b), N_b+1)}{\Theta(\vec{q}^*(N_b), N_b)} = \frac{(N-N_b)\sum_{i=N_b+2,\ldots,N}(1/(2c_{qi}))}{(N-N_b-1)\sum_{i=N_b+1,\ldots,N}(1/(2c_{qi}))},$$

since the term $(N-\rho_b(N-1))/(N-N_b\rho_b)$ cancels out. Hence, the direct effect is *invariant* in ρ_b when interior solutions exist for the quality investment game. When there exists k such that $q_j^*(N_b)=1$ for $j\le k$ but $\exists\, i$, $q_i^*(N_b)<1$, similar algebra shows that Θ is decreasing in ρ_b. When $\forall\, i$, $q_i^*(N_b)=1$, the direct effect is invariant in ρ_b. □

Proof of Corollary 1. Corollary 1 follows directly from Proposition 3. When $1/(2c_{qi})$ is uniformly distributed on $[\mu-\delta, \mu+\delta]$, $\sum_{i=N_b+1,\ldots,N}(1/(2c_{qi}))/(N-N_b) = \mu-\delta+(N-N_b)\delta/N$. It follows that $\Theta(\vec{q}^*(N_b), N_b+1)/\Theta(\vec{q}^*(N_b), N_b) = 1-\delta/(N\mu-N_b\delta)$.

To get the boundary condition $\rho_b > \delta/\mu$, let us examine the conditions under which $\Theta(\vec{q}^*(N_b+1), N_b+1)/\Theta(\vec{q}^*(N_b), N_b) > 1$. When all firms choose interior quality levels, it turns out that

$$\frac{\Theta(\vec{q}^*(N_b+1), N_b+1)}{\Theta(\vec{q}^*(N_b), N_b)} = \frac{\Theta(\vec{q}^*(N_b), N_b+1)}{\Theta(\vec{q}^*(N_b), N_b)}\cdot\frac{q_i^*(N_b+1)}{q_i^*(N_b)},$$

where i can take any value. Solving this inequality, we obtain the boundary condition $\rho_b > \delta/\mu$. Note that the boundary condition is independent of N_b. Thus, the equilibrium COO stereotype is always a monotone function of N_b. □

Proof of Lemmas 1 and 2. Consider the function $\Pi_i(q_i, 1; \vec{q}_{-i}, \vec{b}_{-i}) - \Pi_i(q_i, 0; \vec{q}_{-i}, \vec{b}_{-i})$. From Equation (4), we have

$$\begin{aligned}\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i}) &= \Pi_i(q_i, 1; \vec{q}_{-i}, \vec{b}_{-i}) - \Pi_i(q_i, 0; \vec{q}_{-i}, \vec{b}_{-i})\\ &= \left(\frac{M_s}{M_0+M_s} - \frac{M_s}{M_s+M_g}\right)q_i\\ &\quad + \left(\frac{S_0}{M_0+M_s} - \frac{S_g(\vec{q}, \vec{b})}{M_s+M_g}\right) - c_b. \qquad \text{(B3)}\end{aligned}$$

Both lemmas follow naturally from Equation (B3). First, note that given $\vec{q}$, $\vec{b}$, $\partial\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})/\partial M_g > 0$. Therefore, $\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})$ is increasing in ρ_b when M_s is fixed, proving Lemma 1. Next, note that $S_g(\vec{q}, \vec{b})$ is (weakly) increasing in q_k, $k\ne i$. Thus Γ_i is decreasing in q_k. Meanwhile,

$$\frac{\partial\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})}{\partial q_i} = \frac{M_s}{M_0+M_s} - \frac{M_s}{M_s+M_g} - \frac{M_g}{(N-N_b)(M_s+M_g)}.$$

It can be shown that $\partial\Gamma_i(q_i, \vec{q}_{-i}, \vec{b}_{-i})/\partial q_i > 0$ when the condition in Lemma 2 is satisfied. □

Proof of Proposition 4. The proof of Proposition 4 is divided into two parts. First, we show that the equilibrium pattern can indeed be described by a threshold N_b^*, such that all firms, ranked by $1/c_{qi}$, $i\le N_b^*$ choose $b_i=1$ while all firms $i>N_b^*$ choose $b_i=0$. Second, we prove that the equilibrium quality choices q_i^* are as described in Proposition 4 and provide an implicit definition of N_b^*.

From Equation (B3), we obtain that for all j, k, $q_j > q_k$, $\Gamma_j > \Gamma_k$ when $M_0 < M_g$, since $M_s/(M_0+M_s) - M_s/(M_s+M_g) > 0$. Therefore, high quality firms have stronger incentives to engage in COO dissociation. In any subgame in which $b_j=0$ but $b_k=1$, we have $\Gamma_k\ge 0$ but $\Gamma_j\le 0$, a contradiction. The subgames in which the top N_b^* firms, in terms of quality q_i^*, break away from the stereotypes indeed correspond to an equilibrium pattern.

Next, we show that the equilibrium ranking of q_i^* is indeed consistent with the equilibrium ranking of $1/c_{qi}$. Put differently, if a firm's cost is lower, its equilibrium quality choice must be higher. Suppose there exist j, k $c_{qj} > c_{qk}$ and $q_j^* > q_k^*$. If $b_k = b_j$, the quality choices cannot be simultaneously optimal since the two first order conditions cannot be satisfied simultaneously (corner solutions cannot hold either). Thus $b_j=1$ and $b_k=0$. No deviation conditions imply $\Pi_k(q_k^*, 0; \vec{q_{-k}}, \vec{b_{-k}}) > \Pi_k(q_j^*, 1; \vec{q_{-k}}, \vec{b_{-k}})$ and $\Pi_j(q_k^*, 0; \vec{q_{-j}}, \vec{b_{-j}}) < \Pi_j(q_j^*, 1; \vec{q_{-j}}, \vec{b_{-j}})$. From these two inequalities it is implied that $c_{qk}(q_j^{*2} - q_k^{*2}) > c_{qj}(q_j^{*2} - q_k^{*2})$. A contradiction is found.

Thus, in equilibrium, the more efficient firms always choose higher quality; the higher quality firms always have stronger incentives to invest in COO dissociation. The equilibrium can thus be described with the parameter N_b^*. The equilibrium quality levels can be determined in a similar fashion to Propositions 1 and 2. Next, we provide an implicit definition for N_b^*.

For all N_b, define $\vec{b^*_{-i}}(N_b)$ and $\vec{q^*_{-i}}(N_b)$ as in the propositions. Rewrite $\Gamma_{N'}(q'_{N'}, \vec{q_{-N'}}, \vec{b_{-N'}})$ as $\Gamma(N', N_b)$. Define $\Phi(N', N_b)$ as follows:

$$\begin{aligned}\Phi(N', N_b) &= \Pi_{N'}(q''_{N'}, 1; \vec{q^*_{-N'}}(N_b), \vec{b^*_{-N'}}(N_b))\\ &\quad - \Pi_{N'}(q'_{N'}, 0; \vec{q^*_{-N'}}(N_b), \vec{b^*_{-N'}}(N_b)), \qquad \text{(B4)}\end{aligned}$$

where $q'_{N'} = \min\{1, ((N-\rho_b(N-1))/(N-N_b\rho_b))(1/(2c_{qN'}))\}$ and $q''_{N'} = \min\{1, (1-\rho'_b)(1/(2c_{qN'}))\}$. It can be shown that $q''_{N'}$ is the optimal quality choice of firm N' when $b_{N'}=1$. From the insights above, $\Phi(N', N_b)$ is a decreasing function in N'. In words, Equation (B4) describes the payoff when a firm who chooses $q'_i, b_i=0$ deviates by simultaneously changing q and b, into $q''_i, b_i=1$. In a pure strategy equilibrium, the number of firms who engage in COO dissociation is given by N_b^*, such that (1) $\Phi(N_b^*, N_b^*) > 0$ and (2) $\max\{\Phi(N_b^*+1, N_b^*), \Gamma(N_b^*+1, N_b^*)\} < 0$. When $\Phi(N-1, N-1) > 0$, all but one firm break away from the stereotype. When $\max\{\Phi(1,0), \Gamma(1,0)\} < 0$, none of the firms break away from the stereotype. Since Φ and Γ are decreasing functions, the equilibrium is the unique pure strategy equilibrium when it exists. □

Proof of Lemma A.1 and Proposition A.1. It is easy to see from Equation (B3) that when $M_0 > M_g$, $M_s/(M_0 + M_s) - M_s/(M_s + M_g) < 0$ and that high quality firms have smaller incentives to invest in COO dissociation. Furthermore, given that N_b firms break away from the stereotype, the expression for q_i^* is identical to that in the baseline model. Thus, the strategic effect is the same as in Proposition 3 and Corollary 1.

The direct effect is now

$$\frac{\Theta(\vec{q}^*(N_b), N_b+1)}{\Theta(\vec{q}^*(N_b), N_b)} = \frac{(N-N_b)\sum_{i=1,\ldots,N-N_b-1}(1/(2c_{qi}))}{(N-N_b-1)\sum_{i=1,\ldots,N-N_b}(1/(2c_{qi}))} > 1$$

when interior solutions exist for the quality investment game. By similar logic as in the proof for Proposition 3, $\Theta(\vec{q}^*(N_b), N_b+1)/\Theta(\vec{q}^*(N_b), N_b) > 1$ remains true when some firms obtain $q_i^* = 1$. □

References

Anand BN, Shachar R (2004) Brands as beacons: A new source of loyalty to multiproduct firms. *J. Marketing Res.* 41(2): 135–150.

Anderson Analytics (2007) Brands and countries. Stamford, CT. http://www.andersonanalytics.com/reports/BrandAndCountries.pdf.

Arrow K (1973) The theory of discrimination. Ashenfelter O, Rees A, eds. *Discrimination in Labor Markets* (Princeton University Press, Princeton, NJ).

Bilkey WJ, Nes E (1982) Country-of-origin effects on product evaluations. *J. Internat. Bus. Stud.* 13(1):89–100.

Cabral L (2009) Umbrella branding with imperfect observability and moral hazard. *Internat. J. Indust. Organ.* 27(2):206–213.

Credit Suisse (2014) Emerging consumer survey 2014. Research Institute, Zurich. https://publications.credit-suisse.com/tasks/render/file/?fileID=E78BA562-9486-225A-8E2196F57A74B6A4.

Dinnie K (2004) Country-of-origin 1965–2004: A literature review. *J. Customer Behav.* 3(2):165–213.

Erdem T (1998) An empirical analysis of umbrella branding. *J. Marketing Res.* 35(3):339–351.

Erdem T, Sun B (2002) An empirical investigation of the spillover effects of advertising and sales promotions in umbrella branding. *J. Marketing Res.* 39(4):408–420.

Fang H, Moro A (2010) Theories of statistical discrimination and affirmative action: A survey. Technical report, National Bureau of Economic Research, Cambridge, MA.

Hakenes H, Peitz M (2008) Umbrella branding and the provision of quality. *Internat. J. Indust. Organ.* 26(2):546–556.

Han CM (1989) Country image: Halo or summary construct. *J. Marketing Res.* 26(2):222–229.

Hong S-T, Kang DK (2006) Country-of-origin influences on product evaluations: The impact of animosity and perceptions of industriousness brutality on judgments of typical and atypical products. *J. Consumer Psych.* 16(3):232–239.

John DR, Loken B, Joiner C (1998) The negative impact of extensions: Can flagship products be diluted? *J. Marketing* 62(1): 19–32.

Keller KL (1993) Conceptualizing, measuring, and managing customer-based brand equity. *J. Marketing* 57:1–22.

Leclerc F, Schmitt BH, Dubé L (1994) Foreign branding and its effects on product perceptions and attitudes. *J. Marketing Res.* 31(2):263–270.

Levin J (2009) The dynamics of collective reputation. *BE J. Theoret. Econom.* 9(1):1–23.

Liefeld JP (2004) Consumer knowledge and use of country-of-origin information at the point of purchase. *J. Consumer Behav.* 4(2): 85–87.

Loken B, John DR (1993) Diluting brand beliefs: When do brand extensions have a negative impact? *J. Marketing* 57:71–84.

Lundberg SJ, Startz R (1983) Private discrimination and social intervention in competitive labor market. *Amer. Econom. Rev.* 73(3):340–347.

Maheswaran D (1994) Country of origin as a stereotype: Effects of consumer expertise and attribute strength on product evaluations. *J. Consumer Res.* 21(2):354–365.

Maheswaran D, Chen CY (2006) Nation equity: Incidental emotions in country-of-origin effects. *J. Consumer Res.* 33(3): 370–376.

Maheswaran D, Chen CY (2009) Nation equity: Country-of-origin effects and globalization. Kotabe M, Kelsen K, eds. *Handbook of International Marketing* (Sage, Thousand Oaks, CA), 91–113.

McKinsey and Company (2012a) From mass to mainstream: Keeping pace with China's rapidly changing consumers. https://www.mckinsey.com/~/media/McKinseyOffices/Korea/PDFs/Chinese_Consumer_Report.ashx.

McKinsey and Company (2012b) Winning the $30 trillion decathlon: How to succeed in emerging markets. http://www.mckinsey.com/insights/strategy/winning_the_30_trillion_decathlon_going_for_gold_in_emerging_markets.

Montgomery CA, Wernerfelt B (1992) Risk reduction and umbrella branding. *J. Bus.* 65(1):31–50.

Phelps ES (1972) The statistical theory of racism and sexism. *Amer. Econom. Rev.* 62(4):659–661.

Roth MS, Romeo JB (1992) Matching product category and country image perceptions: A framework for managing country-of-origin effects. *J. Internat. Bus. Stud.* 23(3):477–497.

Samiee S, Shimp TA, Sharma S (2005) Brand origin recognition accuracy: Its antecedents and consumers' cognitive limitations. *J. Internat. Bus. Stud.* 36(4):379–397.

Simonin BL, Ruth JA (1998) Is a company known by the company it keeps? Assessing the spillover effects of brand alliances on consumer brand attitudes. *J. Marketing Res.* 35(1):30–42.

Tadelis S (1999) What's in a name? Reputation as a tradeable asset. *Amer. Econom. Rev.* 89(3):548–563.

The Economic Times (2012) Indian brands with foreign labels like "Munich polo" make name for themselves. http://articles.economictimes.indiatimes.com/2012-07-27/news/32889547_1_indian-brands-foreign-brand-da-milano.

Tirole J (1996) A theory of collective reputations (with applications to the persistence of corruption and to firm quality). *Rev. Econom. Stud.* 63(1):1–22.

Wernerfelt B (1988) Umbrella branding as a signal of new product quality: An example of signalling by posting a bond. *RAND J. Econom.* 19(3):458–466.

Winfree JA, McCluskey JJ (2005) Collective reputation and quality. *Amer. J. Agricultural Econom.* 87(1):206–213.

World Brand Lab (2013) Asian brand loyalty survey. New York. www.worldbrandlab.com.