DISCUSSION PAPERS IN ECONOMICS

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remaining on the market, a lower exclusivity suggests that the buyers of status goods rank lower in the income hierarchy, resulting in a lower conspicuous value, which may threaten conspicuous consumption.

For example, suppose there are q_H type H consumers and q_L type L consumers who value a good at $v_H = 5$ and $v_L = 3$ respectively, and let $\lambda = q_L/q_H$ denote the ratio of L to H in the market. Suppose the true value of λ is 1 but it is known only to the seller. Also, assume that marginal production cost is 0 and consumer's willingness to pay is characterized by $v_i + E(\lambda)$, $i = H; L$, when the product is sold exclusively to consumer H. If consumers are truthfully informed that $\lambda = 1$, conspicuous consumption is possible, because setting the price at 6 to sell the product only to H is not less profitable than selling it to everyone at 3, because when $\lambda = q_L/q_H = 1$, we have $(5 + 1)q_H \geq 3(q_H + q_L)$.

However, when consumers do not know $\lambda = 1$, but instead believe that it is uniformly distributed on $[0; 2]$, a price equal to 6 delivers the message that $\lambda \leq 1$, because when $6q_H \geq 3(q_H + q_L)$, it must be that $\lambda \leq 1$. Otherwise, the seller will find $6q_H < 3(q_H + q_L)$ and set the price at 3. With this signal, consumers' beliefs will be updated to $\lambda \in [0; 1]$, resulting in $E(\lambda) = 0.5$. Therefore, the seller can only set the price at 5.5 at maximum if selling the product exclusively to H. Further such iterations cause consumers' beliefs to converge to $\lambda \in [0; 0.8]$ and $E(\lambda)$ to converge to 0.4, eventually resulting in a price reduction to 5.4 when selling exclusively to consumer H.[1] Comparatively, selling to all consumers at a price of 3 is more profitable. In this sense, consumer's uncertainty regarding market demand, or more specifically, exclusivity at a given price, impairs conspicuous consumption, which would have generated higher profit under perfect information assumption.

When there are two types of consumers so that conspicuous consumption is possible only if the good is sold exclusively to one of these types, the target consumer's willingness to pay may decrease as a result of price signaling, which could reduce the seller's profit. If profit loss becomes severe, this mechanism eliminates conspicuous consumption, provided

[1] Specifically, let $\lambda \sim U[a_i; b_i]$ for iteration i, and $E_i = \frac{b_i - a_i}{2}$ be $E(\lambda)$ for iteration i. Then we have $a_i = 0$, $\forall i$, and $b_{i+1} = \frac{b_i/2+5}{3} - 1$. Setting $b_i = b_{i+1}$ yields $b_i \to 0.8$ as $i \to \infty$.

that selling status goods to all consumers becomes more profitable. When the scenario is generalized to include more than two types of potential consumers, the price signal affects the conspicuous value of each type of consumer. As the seller raises the price to enhance exclusivity, the marginal conspicuous value is diminished. This mechanism reduces the marginal profit generated by the price increase. Therefore, the seller may sell the status goods at a lower price to more types of consumers than would be optimal under perfect information assumption, which could result in a lower profit. Since the reduction in profit is caused by insufficient conspicuous value, a status good is more susceptible to the impact of the price signal if high income consumers are primarily interested in the product due to its conspicuous value $E(\ )$ rather than the direct value v_H in the above example. Moreover, the magnitude of the price signal effect is determined by the seller's profit associated with conspicuous consumption in comparison to his profit from selling the good as daily necessities. If a firm has a lower profit associated with conspicuous consumption, the negative impact by the price signal on such a profit is greater.

As a managerial implication, when a seller fails to recognize that consumers lack information about the market demand or do not consider the negative effect brought by the price signal, he may set price higher than the target consumers are willing to pay, resulting in a business loss; or he may overestimate the profit and enter the market for status goods mistakenly. Even for firms that remain in the market for status goods, maintaining high prices and exclusivity is sometimes difficult. Affordable luxury brands, such as Coach and Kate Spade, frequently offer substantial discounts on their products and sell them in outlet stores in order to attract more customers.

Although the price signal is unavoidable if consumers are uncertain about the market demand for status goods, the seller should still take measures to protect his profit if he chooses to remain on the market. The price signal functions on the consumer's initial support of possible exclusivity levels, for example, $[0;2]$ in the introductory example above. If consumers severely underestimate the exclusivity, for example, by having initial support of $[0; 0.5]$, before seeing the price, their decisions are largely determined by this initial designer brands' tolerance of Zara which is famous for borrowing their designs. Zara is rarely sued for copying designs from other brands, especially considering how much and how many of their products are similar to other brands' collections.

According to the ndings of my study, the status goods may not be as pro table as is typically conceived. If conspicuous consumption is thriving, counterfeits may contribute to its success. More importantly, the coexistence of counterfeiting and the growing popularity of authentic products may be evidence that re ects the price signaling issue in the status goods market. Though counterfeiting is occasionally perceived as a \problem" rather than a \solution" on the luxury goods market, regulators should understand the role it plays in neutralizing the price signaling e ect that may undermine conspicuous consumption, which depends on whether consumers have adequate knowledge of the market demand.

The structure of my paper is as follows: Section 2 discusses the related literature. After establishing the model in Section 3, I discuss the main equilibrium with only two types of consumers in Section 4. This section demonstrates that the price signal may reduce the pro tability of conspicuous consumption and may even eliminate it completely. Section 5 extends the scenario to include more than two types of consumers and shows that the main result is robust to this generalization. Finally, Section 6 concludes with remarks.

2 Related Literature

My paper contributes to the topic of price as a signal in transactions. Price as a signal information about market demand (Bagwell and Ramey, 1990; Albaek and Overgaard, 1992). But most previous studies have focused on the supply side (such as retailer and entrant) as the receiver of the signal of market demand because consumers are not concerned with market demand. However, in the market for conspicuous goods, exclusivity, which is closely related to market demand, determines the conspicuous value and is hence the primary issue for consumers. This study investigates how the price could convey a signal of market demand to consumers and affect conspicuous consumption as a result. It complements another paper discussing the price signal in conspicuous consumption, in which conspicuous consumption undermines price signal that conveys the information about the product quality (Zhang, 2022).

Besides, my paper is related to the literature about the Veblen effect or conspicuous consumption. The study of conspicuous consumption originated with the Veblen effect which was first noticed by Veblen (1899). In recent decades, researchers have fitted conspicuous consumption into the framework of signaling game as behavior that signals personal traits or social status (some of the seminal works includes Pesendorf, 1995; Bagwell and Bernheim, 1996; Corneo and Jeanne, 1997). But previous related studies have either assumed that conspicuous value is independent of exclusivity or market demand (Liu et al., 2019), that consumers know market demand (Rao and Schaefer, 2013), or that their expectations regarding it are rational and accurate (Amaldoss and Jain, 2005a, 2005b). This paper, on the other hand, focuses on the scenario in which consumers, who are uncertain of market demand, may form a biased belief about the conspicuous value that is determined by counterfeits in the market.[4] It complements the existing studies stating that counterfeits may result in innovation in general markets (Qian, 2014) or solve the time inconsistency problem in markets for durable goods (Ding, 2014), which supports the empirical evidence by Romani et al. (2012) that counterfeits may increase consumers' willingness to pay for authentic goods. The implication of this paper is consistent with Yildirim et al.(2016), who demonstrate that consumers are willing to purchase more authentic goods to outpace own X, and it is a function of exclusivity $2 \ [0; 1 \ )$.

one unit of good X if $E(u_i|p)$ is greater than or equal to zero, and does not if otherwise.

$$E(u_i|p) = v_i + E[g(\;)|p] - p \tag{1}$$

Knowing consumers' distribution of net value, the seller's objective is

$$\max_p (p - c)|\{i|E(u_i|p) \geq 0\}| \tag{2}$$

where cardinality $|\;|$ determines the number of consumer i buying the good X.

In the Perfect Bayesian equilibrium of this sequential game, the seller sets p to optimize objective (2) based on his anticipation of consumers' best responses. After observing p, consumers make decisions simultaneously depending on the value of (1). After the purchase is made, consumer i receives $u_i = v_i + g(\;) - p$ as the payoff. She gets 0 if deciding not to purchase X.

4 Equilibrium

In my model, because those who do not buy the good receive 0, conspicuous consumption, where consumers pay more than the direct value of a good, is possible only when selling to a part of the consumers[8]. Specifically, in this section, we focus on the condition which makes the seller sell good X exclusively to consumer H.

4.1 Benchmark Condition

Given two representative consumers, H and L on the market, $\;= 1$ when only consumer H owns the good X. If both consumers have it, $\;= 0$ and conspicuous value vanishes. When consumers have full information about the market demand (the number of H and

[8]Alternately, if consumers who do not purchase good X are recognized and receive a negative net value, they are willing to pay to avoid being excluded. Under this circumstance, conspicuous consumption may be possible even if sold to everyone.

L type consumers on the market), they can precisely determine price is set above v_L. As in the benchmark, consumer L never engages in conspicuous consumption and she exits the market as long as $p > v_L$. This is because she believes that her decision to purchase good X implies that all other L type consumers will make the same decision, causing the conspicuous value to vanish. Therefore, consumer H knows

Lemma 1. Suppose $\frac{1}{N \quad k+1}$ $\frac{p \quad c}{v_L \quad c}$ 1, E [g( )jp] E [g( )]; If k > $\frac{p \quad c}{v_1 \quad c}$, E [g( )jp] < E [g( )].

$\frac{1}{N \quad k+1}$ $\frac{v_H \quad c}{v_L \quad c}$ 1 ensures thatf $\frac{m}{l}$j $\frac{m}{l}$ $\frac{p \quad c}{v_1 \quad c}$ 1g is not an empty set. If k $\frac{p \quad c}{v_1 \quad c}$, E [g( )] is una ected by the price signal and therefore E [g( )jp] = E [g( )]. If k > $\frac{p \quad c}{v_L \quad c}$, some ^ = $\frac{m}{l}$ that are greater than $\frac{p \quad c}{v_L \quad c}$ and should be assigned 0 probability, while all smaller ^ that are less than $\frac{p \quad c}{v_L \quad c}$ 1 are assigned a greater probability. As g( ) is strictly increasing in , we have E [g( )jp] < E [g( )].

Lemma 1 implies that a price greater than v_L that makes conspicuous consumption possible also sends a signal that is not in favor of conspicuous consumption, when consumers are uncertain of the market demand[9]. Particularly, if max f ^g = (k 1)=1 is greater than $\frac{p \quad c}{v_L \quad c}$ 1 , indicating that consumer's estimation of exclusivity before seeing the price is overly high, such estimation would be corrected by the price signal. However, such price signal always undermines consumer's expected conspicuous value E [g( )] as well as her expected indirect ut2 Tf 12, indicating that consumee08 11

signal always undermines consumer

$E[g(\ )|\ \ h] \ \ c \ \ (h \ \ +1)(v_L \ \ c)$ and $f\ \hat{}|\hat{}\ \ hg \neq\ ;$, where $=\min f\ h\ \ \hat{}|\hat{}\ \ hg$, is a necessary and sufficient condition for (4) to hold.

Proof. See Appendix A.1 □

h measures the maximum value of exclusivity that is possible. For any given h, if

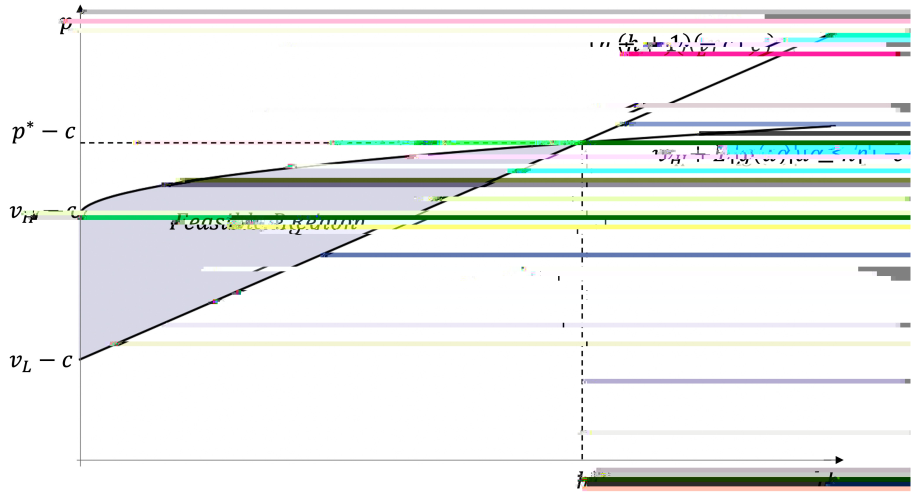

Figure 1: Feasible Region and Optimal Price of Conspicuous Consumption!(0)

from consuming the good. This conclusion is consistent with the simple example presented in the Introduction where the e ect of the price signal causes the upper bound of the uniform distribution to converge to 0.8 rather than 0.

The existence ofp > v_H

satisfies v_H + E [g( )j ^] c (^ + 1)(v_L c), and $^{\wedge}_{i+1}$ be the smallest ^ that satisfies v_H + E [g( )j ^] c < (^ + 1)(v_L c). Intuitively, since (h + 1)(v_L c) is continuous in h, there must exist an h 2 [$^{\wedge}_i$; $^{\wedge}_{i+1}$) that satisfies (5) as (h + 1)(v_L c) bypasses v_H + E [g( )j h] c from below. And E [g( )j h] = E [g( )j $^{\wedge}_i$].

As reflected by Figure 1, with ! 0, the intersection between p = v_H + E [g( )j h] c and p = (h + 1)(v_L c) uniquely determines h , and p = v_H + E [g( )j h] is the maximum p within the feasible region that allows for conspicuous consumption.[11] At this price, the profit p c is equal to (h + 1)(v_L c). Only when (h + 1)(v_L c) 2(v_L c) or h 1 will the seller choose to sell good X to only consumer H instead of both representative consumers.

Proposition 2 is consistent with the example in the Introduction and yields the same result with the same numerical parameters.[12] Moreover, it implies a same convergence process as the introductory example. Even if consumer H L c) and ^

required compared to the benchmark, since all possible values of exclusivity that could be justi ed by p in E [g( )j

According to Proposition 3, $v_H + E[g(\ )j \quad h] < v_H + g(1)$, $8h < 2$. If $v_H + g(1) <$ $3(v_L \quad c) + c$, there exist a $\tilde{h} < 2$ such that $v_H + g(1) = (\tilde{h} + 1)(v_L \quad c) + c$, implying that $v_H + E[g(\ )j \quad h] <$

underestimation of exclusivity, as indicated by Lemma 1.

A threshold consumer would believe "there are much more rich people than what I originally thought" and consequently reduce their willingness to pay when observing the price of status goods, particularly if they purchase these status goods primarily to satisfy their conspicuous needs. Proposition 1 implies that consumer's conspicuous value $E[g(\ )|p]$ will not be entirely eliminated by price signal. However, if the price signal is intense enough, the final $E[g(\ )|p]$ may be lower than $g(\ )$, which impairs the seller's profitability in conspicuous equilibrium, according to Proposition 3. In extreme case, if $v_H + g(\ )$ is not significantly higher than $2(v_L - c)$, such a depreciation may cause the profit to drop below $2(v_L - c)$, where conspicuous consumption that could have been possible in benchmark disappears.

Market for status goods is famous for high markup. To maintain a high price and sell only to a small portion of high income consumers, some luxury brands may even burn unsold stocks that worth millions of dollars each year.[13] However, this strategy is practiced only by a small number of high-end luxury brands and can not be sustained by majority of others. Because it is ubiquitous that consumers have little knowledge of the market demand and are therefore affected by the price signal to underestimate the conspicuous value when considering engaging in conspicuous consumption, the strategy of high price and high exclusivity is sometimes hard to be sustained. Some affordable luxury brands, such as Coach, Michael Kors, and Kate Spade, may place their products in outlet stores or offer substantial discounts in order to appeal to more consumers.

This implication is more significant when considering that certain firms may attempt to enter the market for status goods and induce their customers to engage in conspicuous consumption. So that they can charge consumers higher price based on the conspicuous value, especially when the direct value is low. When consumers are well aware of the market

[13] Burberry, for example, is famous for this practice. According to a BBC report, the total value of the stock destroyed in the five years before this practice was discontinued in 2018 may have reached £90 million (https://www.bbc.com/news/business-44885983).

demand, this strategy may help increase consumers' willingness to pay if $g(\ )$ is high. For example, in the benchmark of this section $g(1)$ could raise consumer H's willingness to pay above $2v_L \quad c$, making selling exclusively to consumer H more profitable. However, when consumers have limited knowledge of the market demand, their estimated conspicuous value upon which they base their decisions becomes $E[g(\ )|\ h]$. As suggested by Corollary 1, the magnitude of the price signal effect h is limited by the difference between the seller's profit from selling exclusively to consumer H versus selling to both consumers. Therefore, exceptional firms that are capable of making a high profit from conspicuous consumption are less susceptible to the negative effect of the price signal and have a greater chance of surviving in the market for status goods. On the contrary, it is extremely difficult for new entrants to survive in this market, as achieving superior quality and establishing a solid reputation and customer base are challenging. Conspicuous value is more of a reward for firms with high profits than a solution for those that require sufficient profits to survive. Therefore, although the high profit in the market for status goods is tempting, it has a high entry barrier that is significantly contributed by the lack of market demand knowledge among consumers. A seller could incur significant losses by entering the market of status good without considering the potential price signal issue associated to consumer's ignorance of market demand.

The reason for the existence of the price signal is that consumers are uncertain about the exclusivity. Due to this uncertainty, a consumer's initial belief is formed before the price signal modifies it. A scenario could be worse than the price signal constraining con-

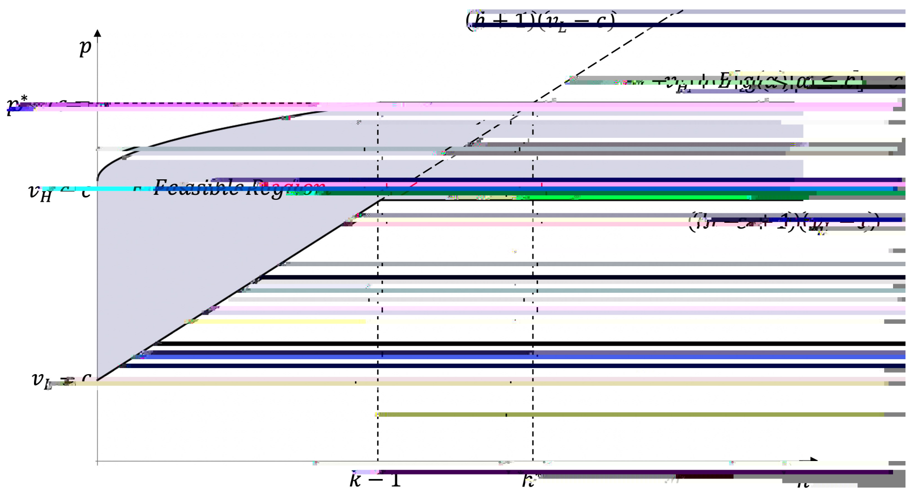

Figure 2: Feasible Region and Optimal Price of Conspicuous Consumption (1 k

5 Multiple-type Consumers

Section 4 derived and analyzed the main equilibrium with consumers who represent two different types H and L. In this section, the model is generalized to include $M \geq 2$ consumers representing M different types. With this change, the actual distribution of direct value on the market becomes $\{v_1, \ldots, v_M\}$, where v_i v_j as long as $i > j$. For tractability, I assume that

5.1 Benchmark

When consumers are well aware of $\{v_1, \dots, v_M\}$, given the price, they can rationally deduce how many consumers out of M are excluded from the market in the subgame equilibrium and can characterize θ at this price unambiguously. As there is no uncertainty regarding θ, consumer i buys one unit of good X only when $p \leq v_i + g(\theta)$. Anticipating their best responses, the seller will set the price at $v_i + g(\frac{i-1}{M-i+1})$ if he desires to optimally exclude consumers with direct values smaller than v_i.

When the seller increases the exclusivity from $\frac{i-1}{M-i+1}$ to $\frac{i}{M-i}$, he is able to increase the price by $\Delta v + \frac{M}{(M-i+1)(M-i)} g'(\theta)|_{\theta \in (\frac{i-1}{M-i+1}, \frac{i}{M-i})}$ while losing one unit of sales volume. B_i, $i \in \{1, \dots, M-1\}$ below gives the marginal benefit of such change.

$$B_i = (M-i)\left[\Delta v + \frac{M g'(\theta)|_{\theta \in (\frac{i-1}{M-i+1}, \frac{i}{M-i})}}{(M-i)(M-i+1)}\right] - v_i - g\left(\frac{i-1}{M-i+1}\right) \qquad (6)$$

An equilibrium, in which sales volume is $M-i$ and price is $v_i + g(\frac{i}{M-i})$, is possible only when $B_i \geq 0$ and $B_{i+1} < 0$. The following lemma shows that there is an unique i that satisfies this condition.

Lemma 3. As long as M is sufficiently great and $|g''(\theta)|$ is sufficiently small, if $g\left(\frac{1}{M-1}\right) \geq \frac{v_1}{M-1}$

from this benchmark. Specifically, let B_i^S denote the marginal benefit in the price signaling case when decreasing the sales volume from $M-i+1$ to $M-i$. If B_i^S decreases in i and be smaller than 0 at i, price signal causes the seller to sell good X to more types of consumers compared to the benchmark, which lowers the degree of conspicuous consumption.

5.2 Price Signal Effect

I assume that is negligible in this section to simplify the problem. Under this assumption, h_i is uniquely determined by (7) according to Lemma 5 in Appendix A.3. Condition (7) also suggests that h_i increases as i increases.

Let f_i denote $\frac{E[g( )j \quad h_{i+1}] \quad E[g( )j \quad h_i]}{h_{i+1} \quad h_i}$, condition (7) implies that $E[g( )j \quad h_{i+1}]$ $E[g( )j \quad h_i]$ is represented by $\frac{f_i}{v_1 \quad f_i}$ v. According to Lemma 4 in Appendix A.2, if $g^{00}( ) < 0$, f_i is decreasing in i with being negligible.

When decreasing the sales volume from $M \quad i + 1$ to $M \quad i$, the seller can increase the price to extract the extra direct and expected conspicuous value from the remaining consumers, while losing one unit of sales volume. Thus, the seller's marginal benefit of making such a change, B_i^S can be expressed as (8) below.

$$B_i^S = (M \quad i) \quad 1 + \frac{f_i}{v_1 \quad f_i} \quad v \quad v_i \quad E[g( )j \quad h_i] \tag{8}$$

As f_i decreases in i and $v_i + E[g( )j \quad h_i]$ increases in i, B_i^S decreases in i. Therefore, as long as $B^S_{i \; +1} < B_{i \; +1} < 0$, we have $B_i^S \quad 0$ at $i \quad i$, which implies that the price signal may increase the equilibrium sales volume in multi-type consumer context. This condition is realized if v is sufficiently low.

Proposition 4. Given that $g \; \frac{1}{M \quad 1} \quad \frac{v_1}{M \quad 1}$ and $g^{00}( ) < 0$, there exists a > 0 such that as long as $v \in (0;)$, there exists an $i \in \{1; :::; M \quad 1\}$ such that $B^S_{i \; +1} < B_{i \; +1} < 0$.

Proof. See Appendix A.4 □

$B^S_{i+1} < B_{i+1} < 0$ is resulted. This is possible also if v is su ciently small, because B_i decreases as v decreases.

As long as $g \frac{1}{M \quad 1} \qquad \frac{v_1}{M \quad 1}$, $B_1 \qquad 0$ for any positive v this may not be the case if the price signal is present, causing the seller to sell more than the benchmark scenario.

This deviation in level of conspicuous consumption led by price signal may eventually result in a lower pro t in the equilibrium due to a lower conspicuous value, making it less optimal than benchmark for the seller. Similar to Corollary 1, the following corollary implies a su cient condition for the pro t to be lower in the case of price signaling than in the benchmark.

Corollary 2. Given that $g^{00}(\ ) < 0$, $g(\frac{i\ \ 1}{M\ \ i+1}) > E\ [g(\ )j\ \ \ h_i]$, as long as $v_i + g(\frac{i\ \ 1}{M\ \ i+1}) <$ $(2\frac{i\ \ 1}{M\ \ i+1} + 1)\, v_1$.

Corollary 2 is a generalized version of Corollary 1 in Section 4, with $= 1$ and $v = v_H$ replaced by $\frac{i\ \ 1}{M\ \ i+1}$ and v_i, respectively, and c set to 0. It relies on the same mechanism as Corollary 1: $v_i + g(\frac{i\ \ 1}{M\ \ i+1}) < (2\frac{i\ \ 1}{M\ \ i+1} + 1)\, v_1$ implies $v_i + E\ [g(\ )j\ \ \ h] < (h + 1)\, v_1$ at $h = 2\frac{i\ \ 1}{M\ \ i+1}$. Therefore, as in Corollary 1, $h_i < 2\frac{i\ \ 1}{M\ \ i+1}$ is resulted, which makes $E\ [g(\ )j\ \ \ h_i]$ smaller than $g(\frac{i\ \ 1}{M\ \ i+1})$.

$v_i + g(\frac{i\ \ 1}{M\ \ i+1})$ being smaller than $(2\frac{i\ \ 1}{M\ \ i+1} + 1)\, v_1$ at given i is more likely if v is small enough, because a smaller v lowers $v_i + g(\frac{i\ \ 1}{M\ \ i+1})$. On the basis of Proposition 4, if v is small enough to make $E\ [g(\ )j\ \ \ h_i] < g(\frac{i\ \ 1}{M\ \ i+1})$ at $i = i^S$ such that $B^S_{i^S}\ \ \ 0$ and $B^S_{i^S+1} < 0$, the price signal lowers the seller's pro t in the equilibrium. Given $B^S_{i^S}\ \ \ 0$ and $B^S_{i^S+1} < 0$, the optimal pro t is achieved at a sales Td [(Molum)-306(opf]TJ/F52 11.9552 Tf 226 1

5.3 Discussion

As indicated by Proposition 4 and Corollary 2, the conclusion that price signal may reduce the level of conspicuous consumption and impair seller's profit is robust in generalized scenario with multiple types of consumers. And sufficiently small Δv serves as the supporting factor for these results.

In addition to serving as a robustness check, the model of this section establishes a more flexible framework that may accommodate more implications. Relaxing the assumption that $\Delta v > 0$ is constant for all i and setting $\Delta v = 0$ for some i results in $h_i = h_{i-1}$ for these i, according to (7). It implies that if the seller wishes to sell the good to threshold consumers with direct value v_i, he must sell to all of these consumers. Nevertheless, this issue does not exist if consumers know the market demand and can relate the price to the exclusivity precisely. With consumers' full knowledge, the seller can control the price to sell the good to a subset of threshold consumers with same direct values, because any extra ownership reduces the current conspicuous value. For those threshold consumers who are intended to be excluded, buying the good causes their net payoff to be negative, which makes them to voluntarily abstain from doing so. Therefore, if selling to a part of the threshold consumers is more beneficial, the existence of the price signal due to consumers lacking knowledge about market demand may further reduce the seller's profit compared to the benchmark.

In the real world, it is difficult for consumers to determine not only the size of each type of their peers, but also the number of types and their associated direct values on the market. Nevertheless, the generalization of consumer's belief prior to the price signal shows that the result of this paper is unaffected by this fact. With this generalization, consumers are allowed to hold either a more complicated belief which includes types that do not exist in society with a simple income structure, as discussed above, or a simpler belief which omits some types that do exist, as in this generalized section when $N < M$.[16] If exclusivity is the

[16]Specifically, in this generalized actual distribution $\{v_1; \ldots; v_M\}$ where $v_{i+1} - v_i = \Delta v > 0$ for $i =$

only factor that determines conspicuous value, different beliefs $\{\hat{v}_1, \ldots, \hat{v}_k, \ldots, \hat{v}_N\}$, whether identical or distinct to the actual distribution $\{v_1, \ldots, v_M\}$, produce the same payoff for consumers in the equilibrium, so long as they do not know $\{v_1, \ldots, v_M\}$, and k and N are fixed. Although $\hat{v}_1 = v_1$ is still necessary, this only requirement on the information structure that restricts $\{\hat{v}_1, \ldots, \hat{v}_N\}$ has been significantly relaxed compared to the majority of previous studies, which assumed that consumers must know the entire actual distribution $\{v_1, \ldots, v_M\}$.

6 Concluding Remarks

Most previous studies of conspicuous consumption have assumed that consumers are fully aware or could rationally deduce an unbiased exclusivity as the determinant of their conspicuous value. My paper demonstrates that conspicuous consumption is still possible even when consumers lack complete information about market demand and can therefore infer a biased exclusivity. However, this conspicuous consumption is constrained by the price signal, which may correct consumers' overestimation of exclusivity but could also lead to a final underestimation of it.

Besides excluding some consumers from the market to create exclusivity and conspicuous value, a high price may also convey information about this exclusivity if consumers on the market for status goods are uncertain of the market demand. If the group of excluded consumers is too large, it would not in the seller's best interest to set such a high price. Therefore, a price that enables conspicuous consumption undermines consumers' beliefs in exclusivity and constrains their willingness to pay for the conspicuous value. In an investigation into how price signal affects the conspicuous consumption, I showed that the price signal may reduce the seller's profit and even eliminate conspicuous consumption

$1, \ldots, M-1$, all consumers can even hold the prior belief same as the one in Section 4 where $\hat{v}_j = v_L$ for $i = 1, \ldots, k$ and $\hat{v}_j = v_H$ for $i = k+1, \ldots, N$. And the result in this section is unaffected with this change in assumption.

completely if the reduction is substantial. This result is applicable in the context where consumers are aware of the consumer types on the market but do not know the number of consumers belonging to each type, and it is robust even when consumers are not fully

References

Albæk, Svend and Per Baltzer Overgaard, \Upstream Pricing and Advertising Signal Downstream Demand," *Journal of Economics & Management Strategy*, 1992, *1* (4), 677{698.

Amaldoss, Wilfred and Sanjay Jain, \Conspicuous Consumption and Sophisticated Thinking," *Management Science*, 2005a, *51* (10), 1449{1466.

— and —, \Pricing of Conspicuous Goods: A Competitive Analysis of Social E ects," *Journal of Marketing Research*, 2005b, *42* (1), 30{42.

Bagwell, Kyle, \Introductory Price as a Signal of Cost in a Model of Repeat Business," *The Review of Economic Studies*, 1987, *54* (3), 365{384.

—, \Pricing to Signal Product Line Quality," *Journal of Economics & Management Strategy*, 1992, *1* (1), 151{174.

— and Garey Ramey, \Advertising and Limit Pricing," *The Rand Journal of Economics*, 1988, pp. 59{71.

— and —, \Advertising and Pricing to Deter or Accommodate Entry When Demand is Unknown," *International Journal of Industrial Organization*, 1990, *8* (1), 93{113.

— and Michael H Riordan, \High and Declining Prices Signal Product Quality," *The American Economic Review*, 1991, pp. 224{239.

Bagwell, Laurie Simon and B Douglas Bernheim, \Veblen E ects in a Theory of

Linnemer, Laurent, \Price and Advertising as Signals of Quality When Some Consumers are Informed," International Journal of Industrial Organization, 2002, 20 (7), 931{947.

Liu, Zhenqi Jessie, Pinar Yildirim, and Jogn Zhang, \A Theory of Minimalist Luxury," Preprint available at SSRN: https://ssrn. com/abstract, 2019, 324672 (9).

Milgrom, Paul and John Roberts, \Limit Pricing and Entry under Incomplete Information: An Equilibrium Analysis," Econometrica: Journal of the Econometric Society, 1982, pp. 443{459.

Pesendorfer, Wolfgang, \Design Innovation and Fashion Cycles," The American Economic Review, 1995, pp. 771{792.

Qian, Yi, \Counterfeiters: Foes or Friends? How Counterfeits A ect Sales by Product quality tier," Management Science, 2014, 60 (10), 2381{2400.

Rao, Raghunath Singh and Richard Schaefer, \Conspicuous Consumption and Dynamic Pricing," Marketing Science, 2013, 32 (5), 786{804.

Romani, Simona, Giacomo Gistri, and Stefano Pace, \When Counterfeits Raise the Appeal of Luxury Brands," Marketing Letters, 2012, 23 (3), 807{824.

Tereyağoğlu, Necati and Senthil Veeraraghavan, \Selling to Conspicuous Consumers: Pricing, Production, and Sourcing Decisions," Management Science, 2012, 58 (12), 2168{2189.

Veblen, Thorstein, The Theory of the Leisure Class: An Economic Study of Institutions, Oxford University Press; Reissue edition 2009, 1899.

Yildirim, Pinar, Zhenqi Liu, and Z John Zhang, \Conspicuous Consumption on the Long Tail: How can Luxury Brands Bene t from Counterfeits?," Working Paper, 2016.

Zhang, Mengqi, \Income E ect and Product Quality in Conspicuous Consumption," Working Paper, 2022.

Appendix

A.1 Proof of Lemma 2

As ^ = $\frac{m}{l}$, f ^j^ hg 6= ; ensures that E [g( )j h] is meaningful according to (3). For h that satisfies this condition, if v_H + E [g( )j h] c < (h + 1)(v_L c), any p v_H + E [g( )j h] that induces consumer H to buy the good would cause $\frac{p\ \ c}{v_L\ \ c}$ 1 < h . When k h 1 h, we must have f ^jh < ^ hg 6= ; for some 2 [0; $\frac{1}{N\ \ k+1}$). Therefore, E g( )j h; $\frac{p\ \ c}{v_L\ \ c}$ 1 < E [g( )j h] , which fails to support E [g( )j h] as a rational expectation of the conspicuous value and shows the necessity of Lemma 2. With the = min f h ^j^ hg that supports this necessity, it is also easy to show the sufficiency. When p = v_H + E [g( )j h] (h + 1)(v_L c), $\frac{p\ \ c}{v_L\ \ c}$ 1 h is resulted. The definition of implies that f ^j^ > $\frac{p\ \ c}{v_L\ \ c}$ 1; ^ hg = ; . Therefore, we have E [g( )j h] = E g( )j h; $\frac{p\ \ c}{v_L\ \ c}$ 1 , which causes p v_H + E g( )j $\frac{p\ \ c}{v_L\ \ c}$ 1 that satisfies (4). Once a E [g( )j h] > 0 is a rational expectation where f ^j^ hg 6= .299 0914,668 Td (.)-482(.73ie9.8 11.9552 Tf 1135 1.794 Td (When)]T

f h^

Let $_{i+1}$ denotes $\frac{ig(\hat{}_{i+1}) \quad \sum_{j=1}^{i} g(\hat{}_i)}{[i(i+1)](\hat{}_{i+1} \quad \hat{}_i)}$, the above equation can be expressed as

$$_{i+1} = \frac{g(\hat{}_{i+1}) \quad g(\hat{}_i)}{(i+1)(\hat{}_{i+1} \quad \hat{}_i)} + \quad _i \quad \frac{i \quad 1}{i+1} \quad \frac{\hat{}_i \quad \hat{}_{i \quad 1}}{\hat{}_{i+1} \quad \hat{}_i} \tag{9}$$

Consider that $\hat{}_{i+1} \quad \hat{}_i = \hat{}_i \quad \hat{}_{i \quad 1}$, the dynamic system (9) approximates $(i+1) \quad _{i+1} = g^0(\ ) + (i \quad 1) \ _i$, which implies that system (9) converge to a static status where the growth rate of $_{i+1}$ converges to $\frac{g^{00}(\ )}{2} < 0$. The definition of $\hat{}$ implies that $\hat{}_{i+1} \quad \hat{}_i$ is increasing in i, which preserves the trend that $_{i+1}$ decreases in i. Therefore, $_{i+1} = \frac{E[g(\ )j \quad \hat{}_{i+1}] \quad E[g(\ )j \quad \hat{}_i]}{\hat{}_{i+1} \quad \hat{}_i}$ is decreasing with the increase of i. □

Given that $\frac{1}{N \quad k+1}$ $\quad v$

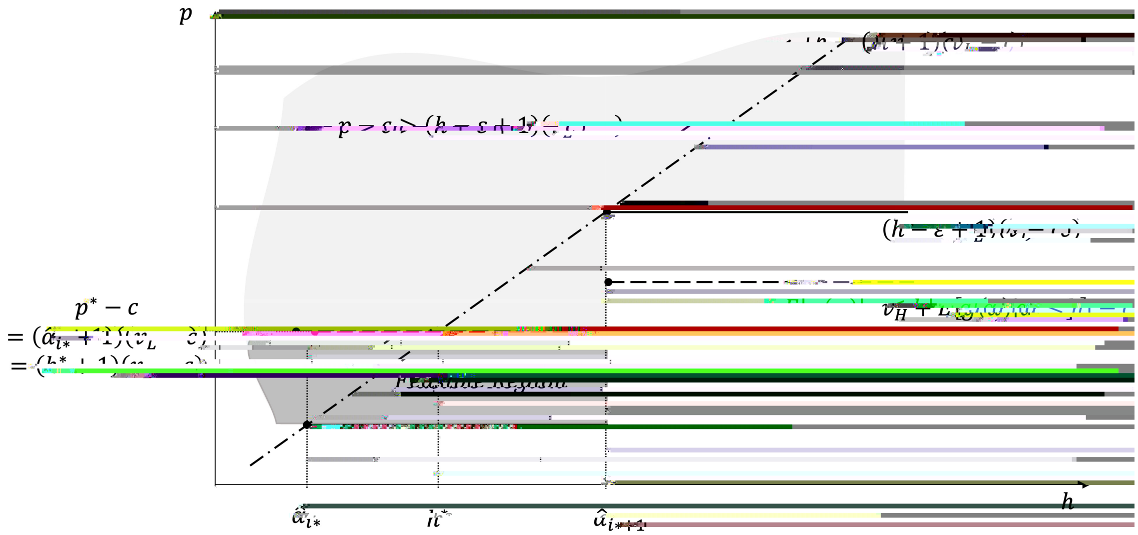

Figure 3: Determining h^* and the Optimal Price in Conspicuous Equilibrium

price p^* that satisfies condition (4) and it is also finite. Since $p^* - c = (h^* + 1)(v_L - c)$ measures maximum profit the seller can collect when selling good X exclusively to consumer H, p^* is an equilibrium price only if it generates a greater profit than the alternative profit $2(v_L - c)$ where good X is sold to all consumers, which requires $h^* + 1 \geq 2$ or $h^* \geq 1$. The proof is now complete.

A.3 Uniqueness of h^*

Proposition 2 shows that condition (5) is a necessary condition that determines h^* and its associated optimal price p^*. Appendix A.2 demonstrates that there is a unique i^* such that $v_H + E[g(\theta)|\theta \geq \hat{\alpha}_{i^*}] - c \geq (\hat{\alpha}_{i^*} + 1)(v_L - c)$ and $v_H + E[g(\theta)|\theta \geq \hat{\alpha}_{i^*+1}] - c < (\hat{\alpha}_{i^*+1} + 1)(v_L - c)$, provided that $\hat{\alpha}_{i^*+1} < \max\{\hat{\alpha}\}$.

Lemma 4 implies that (5) is impossible to hold for any $h \geq \hat{\alpha}_{i^*+1}$. To ensure that h^* determined by (5) is unique, we only need to ensure that $v_H + E[g(\theta)|\theta \geq h] - c > (h + 1)(v_L - c)$ holds for all $h \in [\hat{\alpha}_i; \hat{\alpha}_{i+1})$ and for all $i < i^*$.

Lemma 5. Given that $i < i^*$, if $v_H + E[g(\theta)|\theta \geq \hat{\alpha}_i] - c > (\hat{\alpha}_{i+1} + 1)(v_L - c)$, $v_H +$

$E[g(\ )j\quad h]\quad c > (h+1)(v_L\quad c)$ holds for all $h \; 2 \; [\hat{}_i ; \hat{}_i$

$B_{i+1} < 0$ at $i = \hat{\imath}$ when $v < {}_{q}(\hat{\imath}$