Why Isn't Conspicuous Consumption More Conspicuous?

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Abstract

Ever since Veblen coined the term "conspicuous consumption," we have been at a loss to explain why signalling behaviour is not *more* conspicuous. Why do consumers seem to hide their wealth? Our explanation is that discreet consumption signals social status in addition to wealth. In our model, agents care about their reputation for wealth and social status in addition to their consumption. Wealthy but low-status agents consume conspicuously because discreet consumption is too costly in foregone wealth signalling. Agents who are wealthy and high-status consume discreetly, to distinguish themselves from those with low social status. The model makes a number of predictions about the determinants of conspicuous and discreet consumption.

1 Introduction

Veblen (1899) introduced the idea that conspicuous spending is useful as a costly signal of wealth. Poorer people, for whom conspicuous spending is more costly in foregone private consumption, signal a lower wealth level. Rich people consume more conspicuous goods to publicly establish their higher wealth level. Observers then distinguish the rich from the poor. The idea of conspicuous consumption is simple, intuitive, and powerful.

Take Veblen's example of hand-made silverware. "A hand-wrought silver spoon, of a commercial value of some ten to twenty dollars, is not ordinarily more serviceable...than a machine-made spoon of the same material" (Veblen 1899). Hand-made silverware is what we now call a

"Veblen good." By consuming an expensive good which has functionally equivalent, cheaper substitutes, the owner advertises that he is wealthy. It is tempting to argue that hand-wrought silverware is "more beautiful," and that is why people pay more for it. Veblen addresses this point directly: "The superior gratification derived from the use and contemplation of costly and supposedly beautiful products is, commonly, in great measure a gratification of our sense of costliness masquerading under the name of beauty." He provides the example of dinner lighting to bolster this point: when candles were the cheapest light source available, electric and gas-powered lights were considered more beautiful.

The theory that people consume conspicuously to signal wealth is provocative but incomplete. Casual observation suggests that much of what we attribute to conspicuous consumption is not maximally conspicuous, while the simplest theory of conspicuous consumption unambiguously predicts that, holding price constant, the more conspicuous a consumption good the better. Hand-wrought silverware only signals wealth to dinner guests. Someone who wishes to signal his wealth in as clear a fashion as possible can do better: Bagwell and Bernheim (1996) suggest "[publishing] tax returns or audited asset statements." Instead, some people buy Patek Philippe watches while others buy more conspicuous Rolexes. We define *discreet consumption* to be conspicuous consumption that is not maximally conspicuous.

We claim that discreet consumption is used to signal social status in a dimension that is independent of wealth. Discreet consumption is costly in the sense of forgone signalling about wealth. Because this forgone signalling is less costly for high-status agents, they are able to separate from low-status agents by signalling discreetly. We analyze a model which formalizes this intuition.

We are able to apply our model to a wide variety of settings. Consider Veblen's example of hand-wrought silver spoons. Such items would only be observed by houseguests who are invited for dinner. They are clearly not maximally conspicuous, compared to other forms of conspicuous consumption such as jewelery. However, if they have many guests coming by for dinner that they wish to impress, the owners of hand-wrought silverware are able to signal wealth and social status to their guests by consuming discreetly.

People tend to justify their choice of discreet consumption by claiming that conspicuous consumption is crass and discreet consumption is tasteful. Even if individuals do exhibit a bias for discreet consumption, this begs the question of why the labelling is not reversed, so that conspicuous consumption is considered tasteful while discreet consumption is crass. Furthermore, the association of discreet consumption with "classiness" seems to be almost universal across societies. Our model demonstrates that this intuition has rational underpinnings. People associate discreet consumption with class because people of high social status tend to consume discreetly. To the extent that social norms dictate a bias towards discreet consumption, we would argue that the alternative norm, where conspicuous consumption is associated with class, is unstable and thus rare; high-status individuals cannot separate from low-status individuals by consuming conspicuously.

Our model makes the following predictions, which is in accord with our casual empiricism:

1. Discreet consumption can occur in equilibrium.

2. Wealthy consumers with higher social status consume discreetly, while wealthy consumers with lower social status consume conspicuously.

3. The fraction of the population that consumes discreetly increases when the amount of social capital in society increases.

4. The fraction of the population that consumes discreetly increases when the disparity in social capital between high-status individuals and low-status individuals increases.

There is a significant literature on the consumption of status goods, starting with Veblen (1899). Our principal contribution to this literature is to furnish an explanation for consumption of status goods that are not maximally conspicuous. Bagwell and Bernheim (1996) consider a model where consumers derive benefits from signalling wealth, and with a competitive market for Veblen goods (which correspond to conspicuous consumption in our paper.) Their focus is on the conditions on consumer preferences which allow Veblen effects, where goods are priced above marginal cost, to arise in such a market. For the bulk of our paper, we abstract from such concerns by specifying the price of Veblen goods exogenously, and also by assuming that a wealth constraint prevents poor consumers from Veblen consumption. As such, we take for granted that the nature of consumer preferences causes consumption of status goods to arise in equilibrium, and we focus on the choice between conspicuous and discreet consumption. Thus Bagwell and Bernheim (1996) may be viewed as being complementary to our approach.

The present paper argues that status is about more than just wealth, and we are not unique in making this argument. Cole, Mailath and Postlewaite (1992) interpret status as a social norm that is endogenously determined. They analyze a model where consumers participate in market and non-market sectors, and non-market outcomes are determined by status. They show that equilibria can arise where status is inherited (an aristocratic equilibrium) rather than determined by wealth (a wealth equilibrium.) Although both papers share a concern for non-wealth determinants of status, they differ in approach. Cole, Mailath and Postlewaite are interested in how ssocial norms that induce status rankings are endogenously created. In contrast, we exogenously fix the determinants of status and explore the consequences for consumption of status goods.

Feltovich, Harbaugh and To explore a similar concept to ours, which they term countersignalling. In their model, when observers have access to a noisy signal about the ability of agents, high types may choose not to display a separate signal (that is correlated with type,) in order to separate from medium types. Thus their paper motivates a reluctance to signal as itself a signal of quality, while the present paper explains why agents may choose to signal discreetly when a more conspicuous signal is available.

In section 2, we present our model, prefacing it with an intuitive explanation of the logic behind the model. We then present some predictions of the model, and argue that it is consistent with empirical evidence. We then discuss the significance of our findings and point out future directions for research in section 3. In section 4, we present a microfoundation for the simple utility function used elsewhere to represent the consumer's reputational concerns. In this model, consumers benefits from relationships with observers, who bear the costs of forming the relationship. Observers gain from the relationship if the consumer is wealthy, and also if the consumer has more observers in his social circle. As a result, an observer are more likely to invest in a relationship, which benefits the consumer, when he perceives that the consumer is wealthy and of high social status. Our appendices are reserved for proofs and a discussion of alternative assumptions.

2 A Model of Discreet Consumption

2.1 A preview of the intuition

In our model, consumers differ along two dimensions: the consumer's wealth, and the number of observers in his social circle. We call the latter attribute social status. Each consumer also cares about observers' perceptions of his wealth and social status. Consumers can influence observers' perceptions by purchasing Veblen goods. There are two types of Veblen goods: conspicuous consumption and discreet consumption.

Both Veblen goods have no direct effect on consumer utility (except through observers' perceptions.) Consumers can make a one-time purchase of one unit of either good (but not both). The two types of Veblen goods differ in their observability. Conspicuous consumption can be seen by all observers, while discreet consumption can only be seen by observers within the social circle of the consumer. We study perfect Bayesian equilibria where observers rationally form inferences about the consumer's wealth and social status based on consumers' equilibrium consumption choices. Now, consider the consumption choice of consumers. Consumers who have low wealth are unable to afford either Veblen good. Wealthy agents are then able to separate (in the eyes of observers) from poor agents by purchasing a Veblen good. Crucially, the value of signalling depends on the choice of Veblen good, and the social status of the agent. A wealthy agent with few observers in his social circle will derive little benefit from discreet consumption, because only those observers in his social circle can observe his Veblen consumption; observers outside his social circle cannot distinguish him from non-consuming consumers, and will perceive him to be of low wealth. As a result, wealthy agents with low social status will choose to consume conspicuously, which allows them to alter the perceptions of observers outside their social circle. On the other hand, agents with many observers in their social circle will find discreet consumption more valuable. This then allows wealthy agents with high social status to separate from wealthy low-status agents by consuming discreetly. For such an agent, the gain in utility due to observers in his social circle perceiving that he has high social status outweighs the loss due to observers outside their social circle perceiving him to be of low wealth.

2.2 The Model

There is a unit mass of consumers, each of whom is fully described by (η, θ, w). η is a binary variable that denotes whether the consumer is also an observer; because it does not enter into the consumer's investment decision, we will suppress η for the rest of the analysis. w is the agent's wealth. Each wealthy consumer has some (possibly none) observers in his social circle. θ is the number of observers in the consumer's social circle. (θ, w) is private information for the agent. For simplicity of exposition, we allow θ to vary continuously in the analysis. We assume

$$\theta \in R_0^+,$$
$$w \in \{w_L, w_H\}.$$

Some agents have wealth $w_H > w_L$, and we call them wealthy agents. There is a continuum of wealthy agents, with total mass $\rho \in (0, 1)$. The distribution of θ amongst wealthy agents has continuous d.f. $F(\theta)$ with full support on R_0^+. Poor agents identically have θ_L observers. We assume that $E_F[\theta] < \infty$.

We say that consumers have high social status if they have many observers in their social circle. This is consistent with our later assumption that consumers are specifically interested in impressing observers. For example, consumers may be interested in showing off only to economists. Then the set of observers is the set of economists in the population, and a consumer has high social status if there are many economists in her social circle.

The game unfolds as follows:

1. One consumer is drawn uniformly randomly from the population. He then makes a consumption choice κ.

2. One observer who is not in the consumer's social circle (the stranger) is drawn uniformly randomly from the population. One observer is then drawn uniformly randomly from the set

$$\{\text{observers in consumer's social circle}\} \cup \{\text{stranger}\}.$$

3. The observer monitors the consumer. He also learns whether he is in the consumer's social circle[1]. The observer then makes inferences based on his observation outcome υ.

4. Payoffs from interaction are realized, and leftover wealth is spent on invisible consumption.

Step 2 states that exactly one observer monitors the consumer, and that the likelihood that this observer is in the consumer's social circle increases in the number of observers in the consumer's social circle.

The sender has access to two Veblen goods, one of which is conspicuous, and one of which is discreet. The conspicuous and discreet good both cost $p \geq w_L$ respectively. The sender must make a choice between conspicuous (κ_C) and discreet (κ_D) consumption - she cannot buy both at once. Of course, he can also choose not to consume visibly ($\kappa_\varnothing$). Any observer who monitors the consumer will observe the conspicuous good

[1] We obtain similar results under an alternative assumption, whereby the observer does not know, or does not take into account, whether he is in the consumer's social circle.

when monitoring the consumer. However, if an observer outside the consumer's social circle monitors a consumer who consumes discreetly, the observer may fail to see any Veblen consumption.

There are three possible observation outcomes. First, the observer may observe conspicuous consumption (υ_C). This occurs whenever the consumer chooses κ_C, regardless of whether the observer is in the consumer's social circle. Second, he may observe discreet consumption (υ_D). This occurs if the consumer chooses κ_D and the observer is in the consumer's social circle. Third, he may not observe any Veblen consumption ($\upsilon_\varnothing$). This occurs if the consumer chooses $\kappa_\varnothing$, or if the consumer chooses κ_D and the observer is not in the consumer's social circle. Note that the observation outcome υ is a function of (κ, ϱ), where ϱ is an indicator for whether the observer is in the consumer's social circle.

To fix ideas about the distinction between conspicuous and discreet consumption, consider Louis Vuitton handbags. Each model often comes in two varieties; one is emblazoned all over with the Louis Vuitton logo, while the other is unmarked. At a party, an observer who is some distance away would be able to identify the former as a Louis Vuitton bag due to the prominent markings, but be unable to distinguish the unmarked bag from a cheaper, run-of-the-mill bag. Only when he was next to the owner of an unmarked bag would he be able to identify the bag as being expensive. Thus the marked bag is more conspicuous, while the unmarked bag is relatively discreet. Consider a partygoer who wishes to impress some subset of the other partygoers, who we call observers, with her wealth. Then she may signal wealth to any observer who happens to observe her at the party, regardless of their proximity, by carrying the marked Louis Vuitton bag. On the other hand, only observers who spend some time interacting with the owner of an unmarked bag can observe the bag closely enough to discern that the unmarked bag is expensive. These observers will probably be in the social circle of the partygoer, as the two are introduced by mutual acquiantances. This example motivates our assumption that conspicuous consumption is observable by all observers, while discreet consumption can only be observed by observers in the social circle of the consumer.

The consumer's strategy $\sigma(\kappa|\theta, w)$ induces a likelihood function

$$\varphi(\upsilon, \varrho|\theta, w) = \sum_{\kappa} \sigma(\kappa|\theta, w) P(\upsilon, \varrho|\kappa, \theta, w)$$

for υ. Having obtained υ, the observer then forms his posterior distribution of consumer's type as

$$\mu(\theta, w|\upsilon, \varrho) = \frac{f(\theta, w)\varphi(\upsilon, \varrho|\theta, w)}{\int_{(\theta', w')} f(\theta', w')\varphi(\upsilon, \varrho|\theta', w')}$$

We assume that the consumer's utility is linear in invisible consumption and the observer's perception that he is wealthy. Also, conditional on wealth, utility is linear in the observer's perception of his status:

$$u = v + r_W E_\varrho \left[\mu \left(w_H | \upsilon \left(\kappa, \varrho\right), \varrho\right)\right] + r_C E_\varrho \left[\theta \mu \left(\theta | \upsilon \left(\kappa, \varrho\right), \varrho\right)\right] d\theta. \qquad (1)$$

Here, v is invisible consumption (whose price is normalized to 1). r_W and r_C are respectively the weights that the consumer places on being perceived as wealthy, and on being perceived as having high status. ϱ is an indicator for whether the observer is in the consumer's social circle. The consumer then maximizes this utility function over κ. The interpretation of this utility function is that the consumer wants the observer to perceive him as being wealthy and of high θ. We assume that $r_W > r_C \theta_L$. The latter assumption implies that consumers will prefer to be perceived as (w_H, θ) than as (w_L, θ_L), regardless of θ; so wealthy consumers never want to imitate poor consumers.

A microfoundation for (1) is discussed in section 4.

2.3 Equilibrium

We focus on equilibria where consumption choices and inferences constitute a Perfect Bayesian Equilibrium, placing no restrictions on out-of-equilibrium beliefs. Poor agents cannot consume because they cannot afford to; borrowing is not allowed[2]. This allows us to denote type (w_H, θ) simply as θ. Our first result is that high status consumers consume discreetly, while low status consumers either consume conspicuously or choose $\kappa_\varnothing$. .

Lemma 1 *All equilibria can be characterized as follows. Let $\kappa(\theta)$ be the mapping from type to consumption choice. Then there exists some $\theta^* \in [0, \infty]$ and $\theta^{**} \leq \theta^*$ such that either:*

- $\kappa\left(\left(0, \theta^{**}\right)\right) = \kappa_C$, $\kappa\left(\left(\theta^{**}, \theta^*\right)\right) = \kappa_\varnothing, \kappa\left(\left(\theta^*, \infty\right)\right) = \kappa_D$, *or*
- $\kappa\left(\left(0, \theta^{**}\right)\right) = \kappa_\varnothing$, $\kappa\left(\left(\theta^{**}, \theta^*\right)\right) = \kappa_C, \kappa\left(\left(\theta^*, \infty\right)\right) = \kappa_D$.

  Each of the intervals $(0, \theta^{**})$, (θ^{**}, θ^*), (θ^*, ∞) may possibly have zero length.

The intuition behind this result is as follows. Consider first the case where observers believe that consumers who consume discreetly have

[2] If we relax the borrowing constraint, then we can still ensure that poor agents do not consume visibly by imposing Spence-Mirrlees type conditions on consumer preferences. We are not concerned with this point in the present analysis.

higher expected θ than consumers who consume conspicuously. Then the signaling value of κ_D is increasing in θ; as the number of observer's in the consumer's social circle increases, the likelihood that discreet consumption will be observed increases, so the consumer is more likely to be perceived to have high social status. On the other hand, the signaling value of κ_C is invariant to θ, because conspicuous consumption is observed by all observers regardless of their position in the consumer's social circle. Also, the payoff to $\kappa_\varnothing$ is weakly decreasing in θ. because observers outside the social circle, who cannot observe discreet consumption, give some weight to the possibility that the consumer may be consuming discreetly, while observers in the social circle can see that the consumer is not consuming visibly. This means that whenever type θ consumes discreetly, all types $\theta' > \theta$ will also consume discreetly. Consumers with low social status choose either κ_C or $\kappa_\varnothing$, depending on whether the benefit of signaling exceeds the cost.

There is also the case where observers believe that discreet consumption was a signal of low θ. Then consumers would choose to consume either conspicuously or not at all, corresponding to a equilibrium with $\theta^* = \infty$. This equilibrium, where there is no discreet consumption, is obviously less interesting to us.

2.4 Evidence for Lemma 1

We believe that the results of lemma 1 are intuitive and compelling. Conventional wisdom often associates conspicuous consumption with the *nouveau riche*: people who have recently become wealthy. On the other hand, discreet consumption is associated with *old money*: those whose wealth has been in the family for generations. Our explanation is that old money consumers have been able to accumulate desirable social contacts over the years. On the other hand, the nouveau riche, having recently ascended to wealth, do not have many people worth impressing in their social circle. Thus we may associate old money with high θ and nouveau riche with low θ. The prediction that old money consumes discreetly and nouveau riche consume conspicuously follows immediately.

A striking example for this phenomenon is found in the old and new money families in Jordan studied by Beal (2000). Beal mentions that

> ... the division of Amman's elites into two distinct and conflicting factions – old-money elites whose wealth was established prior to the flood of petrodollars into the country and new-money elites who came by their wealth primarily after 1973.

Beal describes the villa of an "old-money" couple:

> The villa ... though large ... is, in contrast to many of Amman's new villas, located a considerable distance from the road and rather nondescript in exterior appearance ... The sitting room was stuffed full of richly embroidered and gilded furniture.

and explains that

> ... old elites restrict displays of their material luxury to their home interiors.

This is perfectly consistent with the prediction that "old money" types will consume discreetly, so that their wealth is apparent only to observers in their social circle. In contrast, the following is Beal's description of the consumption practices of the "new money" types:

> The homes of the new elite ... scream their opulence at passers-by ... expensive cars driven in a reckless fashion throughout Amman's residential neighbourhoods.

Clearly, "new money" types consume in a maximally conspicuous fashion.

2.4.1 Cultural Capital as Discreet Consumption

Cultural capital is often viewed as a signal of social status. The sociology literature broadly identifies cultural capital with a wide swathe of cultural knowledge and preferences (Lamont and Lareau 1988.) Connoisseurship of wine or art, "posh" accents, and intimate knowledge of the culture of particular academic and social institutions is often associated with high status. For example, Friedman (1994) alludes to

> the birth of a new breed of consumers, whether they are called nouveaux riches, parvenus, or "goulash barons", a breed usually characterised by having too much economic and too little cultural capital ...
>
> In late 19th century Sweden a stock joke about well-to-do farmers was that they bought pianos not for putting champagne glasses on but rather in order to have somewhere to put their hats.

Why is cultural capital viewed as a signal of social status? The existing literature argues that cultural capital is more costly for the nouveux riche to acquire, because of differences in their social environment (Bordeaux 1977.) Our model suggests an alternative explanation: cultural capital is a form of discreet consumption, and as such is acquired only by consumers with high social status for the reasons that we have previously discussed.

Cultural capital may be viewed as a particular form of discreet consumption for two reasons. First, cultural capital is costly to acquire. The specific cultural knowledge that constitutes cultural capital can only be acquired through sustained investment in costly goods, or prolonged and costly membership in the appropriate institutions. Second, cultural capital is not easily observable. However, cultural capital acquired by a consumer is more easily observable to observers within the consumer's social circle, than to observers outside his social circle. A distant observer will surely have trouble discerning that a consumer went to Yale, but upon being introduced by a mutual friend and conversing shortly, the observer will quickly be informed of various aspects of the consumer's college experience. Thus cultural capital fits our assumptions about discreet consumptions nicely[3].

2.5 Comparative Statics

We are particularly interested in equilibria where all wealthy consumers consume visibly, and where conspicuous consumption and discreet consumption both take place in equilibrium. This is what we will call a *Veblen equilibrium*. Such equilibria allow us to study the tradeoff between discreet and conspicuous consumption in a simple setting.

Definition 2 *In any Veblen equilibrium, there exists $\theta^* \in (0, \infty)$ such that all $\theta < \theta^*$ choose κ_C and all $\theta > \theta^*$ choose $\kappa_\varnothing$.*

Proposition 3 *If ρ and p are sufficiently small, then a Veblen equilibrium exists.*

[3] One potential objection to shoehorning cultural capital into our model is that recognizing cultural capital in a consumer requires acquisition of cultural capital by the observer. Such an objection is consistent with the idea that cultural capital is a "secret handshake" known only to high-status individuals. This aspect of cultural capital is missing from our model. Incorporating investment in cultural capital by observers would preserve the key insight that high-status consumers choose discreet consumption (in the form of cultural capital) while low-status consumers chooses conspicuous consumption. Thus our model is able to explain why low-status consumers would be unwilling to invest in "secret handshake technology", instead choosing conspicuous consumption.

Because of the complementarity between investment in cultural capital by observers and consumers, an alternative equilibrium where neither observers nor consumers invest in cultural capital would arise.

Another point of view is that the required investment by observers is negligible; one does not need to be a wine connoisseur to recognize another's knowledge of wine, and one does not need to be a Yalie to be regaled by tales of the Skull and Bones.

Multiple equilibria may emerge for any given set of parameter values. However, we can show that there is a unique Veblen equilibrium that is Pareto dominant with respect to all wealthy consumers. Since only wealthy consumers consume Veblen goods, it is natural to consider the equilibrium that is Pareto dominant (compared to other interior equilibria) with respect to them. It turns out that this equilibrium is the equilibrium with maximal θ^*.

Lemma 4 *Assume that a Veblen equilibrium exists. A Veblen equilibrium with maximal θ^* exists and is the unique Pareto dominant interior equilibrium.*

We are now in a position to present a series of results relating parameter values to the equilibrium ratio of conspicuous consumers to discreet consumers. This ratio is $\frac{F(\theta^*)}{1-F(\theta^*)}$, which is decreasing in $F(\theta^*)$. We analyze the comparative statics of $F(\theta^*)$ in the following proposition.

Proposition 5 *Assume that a Veblen equilibrium exists. At the Pareto dominant Veblen equilibrium θ^*, we have (generically)*

- $\frac{dF(\theta^*)}{dr_C} < 0$,
- $\frac{dF(\theta^*)}{d\rho} < 0$.

Consider an increase in ρ, the fraction of wealthy consumers. If a consumer consumes discreetly, an observer outside his social circle observes no Veblen consumption. However, when ρ increases, the observer increases his posterior likelihood that the consumer is wealthy. On the other hand, ρ has no effect on the payoff to conspicuous consumption. As a result, discreet consumption becomes relatively more valuable, and more consumers choose discreet consumption.

Intuitively, an increase in r_C increases the value of signaling social status relative to the value of signaling wealth. The marginal consumer θ^*, who was previously indifferent to either form of Veblen consumption, now finds discreet consumption more valuable. As a result, more consumers choose discreet consumption. We can interpret r_C as a measure of the amount of social capital in a community; the greater is r_C, the more valuable social connections are. Proposition 5 thus generates the cross-sectional prediction that, ceteris paribus, communities with more social capital have more discreet consumption and less conspicuous consumption.

The most common and compelling alternative explanation for the popularity of discreet consumption is that agents are concerned about theft. The point of the theft theory is that it is important not only to signal to the appropriate audience, but to avoid signaling to the inappropriate audience. The theft theory predicts that discreet consumption will be more common in areas with more crime, and conspicuous consumption will dominate in low-crime areas. Casual empiricism suggests just the opposite - in areas of high crime such as ghettos, we observe lots of conspicuous consumption, whereas discreet consumption often dominates in areas where crime is low. For this reason, the naive crime argument is not very compelling. On the other hand, this observation is perfectly consistent with our model. There is evidence that crime rates tend to be negatively correlated with social capital[4]. In our model, an increase in the amount of social capital results, ceteris paribus, in a decrease in the amount of conspicuous consumption. This generates a positive correlation between conspicuous consumption and crime rates. Insofar as this correlation exists, it suggests that the choice to consume discreetly is driven more by the desire to signal social status than any attempt to avoid theft.

Consider a population where there is great disparity in social capital amongst the wealthy, in the sense that the difference in θ between high status consumers and low status consumers is large. Intuitively, there would be high value to consuming discreetly in order to signal high status in this community. Unfortunately, we are unable to provide a formal statement of this intuition in terms of a comparative static. In general, a decrease in disparity (in the sense of a second-order stochastic dominance shift) does not necessarily result in an increase in $F(\theta^*)$. However, we are able to provide a formal proposition in the limiting case where disparity vanishes.

Proposition 6 *Let* $\{F_1, F_2, F_3 ...\}$ *be a sequence of distribution functions such that* $E_{F_k}[\theta]$ *is constant and* $\lim_{k\to\infty} Var_{F_k}[\theta] = 0$*. Then* $\lim_{k\to\infty} F_k\left(\theta^*_{F_k}\right) = 1$*.*

Loosely, proposition 6 states that a community with greater disparity in social status will have more discreet consumption and less conspicuous consumption. On the other hand, communities where there is little difference in social status across individuals will see more conspicuous consumption and less discreet consumption.

3 Discussion

Our model purports to explain why people choose to consume Veblen goods discreetly, and why conspicuous consumption is associated with

[4] See, for example, Sampson and Groves 1989

a lack of class while discreet consumption is seen as a signal of social status. We choose to interpret discreet consumption broadly; we believe that the model also provides a plausible alternative to existing theories of investment in cultural capital. We also make predictions about the cross-sectional variation in discreet and conspicuous consumption across societies. The most important prediction is that, ceteris paribus, the ratio of discreet to conspicuous consumption is higher in societies with more social capital. Two points should be made about this prediction. First, because discreet consumption may take the form of cultural capital, the prediction would be consistent with an empirical finding that total consumption of Veblen consumer goods (whether they would be considered discreet or conspicuous) is lower in societies with lower social capital. Second, in testing this prediction, care needs to be taken about defining the measure of social capital. In the present model, social capital may be interpreted as the economic value per social connection, so societies that where individuals value social connections more highly are considered to have more social capital.

One can think of the present model as determining which social norms regarding conspicuous consumption can survive in a community. If a community's social norm is such that conspicuous consumption is considered desirable and tasteful while discreet consumption is crass, there would be little incentive for anyone to consume discreetly. However, individuals with high social status would desire to signal their status and separate from low status individuals. Such pressure should make the existing social norm unstable. We may then expect norms to evolve towards the equilibrium that is described by our model, where discreet consumption is considered classy because it is done by high status individuals. This is the norm that seems to hold in most developed societies with high levels of social capital. It is not surprising that not everyone will conform to these norms, or that there are communities where these norms to not seem to hold. By interpreting our model as a theory of the formation of stable social norms for discreet consumption, we hope that we have provided some hints towards the economic motivations behind modesty, that do not simply appeal to psychological or behavioral axioms.

Our model has centered around the effect of social status on the choice between conspicuous and discreet consumption. To this end, we make the stark assumption that there are only two possible levels of wealth, and two types of Veblen consumption. It may be interesting to generalize the model to explore further the effect of wealth on consumption choice. Another possible extension would be to allow multiple levels of conspicuity in the model.

4 Microfoundations

In this section, we sketch a simple model in which linear reputation utility might arise when wealthy agents meet each other to make business deals. The purpose of this section is to provide a motivation for the desire to signal wealth and social status. However, it is not intended as the canonical microfoundation; certainly there are many other stories that we can tell that are consistent with our main model.

4.1 The Model

Assume, as before that there is a continuum of agents. Agents are described by (w, θ), where $w \in \{w_L, w_H\}$ is wealth level and θ is the number of other wealthy agents who are in the agent's social circle. Thus the observers that we describe in our main model correspond to wealthy agents in this model.

The microfounded game unfolds as follows:

1. Agents choose consumption κ.

2. Each consumer is monitored by one monitoring agent[5]. This monitoring agent observes υ and makes inferences about type (w, θ) of the monitored agent.

3. For each pair of agents (i, j) where agent i monitors agent j, stochastic connection cost c_{ij} is realized. c_{ij} is i.i.d. and uniformly distributed on $[0, \overline{c}]$. Agent i chooses whether to pay this stochastic cost, which allows him to connect with agent j.

4. Once connection takes place between i and j, i learns w_j. If i connects with j and find that j is wealthy, he can also connect to fraction ς of j's *existing* wealthy social contacts.

5. Each connected pair of wealthy agents (i, j) are able to generate a business opportunity with profit π for each agent.

6. Agents spend earnings on additional invisible consumption.

Now we consider the payoff of a given agent j. If a wealthy agent i connects to j, i gains π if j is wealthy, and an additional $\varsigma\pi$ for each wealthy agent in j's social circle. Thus he will pay stochastic cost c to connect with agent j if $\pi \cdot \left(\mu\left(w_H|\upsilon\left(\kappa, \varrho\right)\right) + \varsigma \cdot \int \theta\mu\left(\theta|\upsilon\left(\kappa, \varrho\right)\right) d\theta\right) \geq$

[5] To fix ideas, the reader may assume that this observer is selected using the procedure that we describe in section 2 (i.e. randomly selected from). However, any selection method will generate the same result.

c. Assume that $\max_{\kappa,\varrho} \pi \cdot \left(\mu\left(w_H|\upsilon\left(\kappa,\varrho\right)\right) + \varsigma \cdot \int \theta\mu\left(\theta|\upsilon\left(\kappa,\varrho\right)\right)d\theta\right) \leq \overline{c}$. Since c is uniformly distributed on $[0, \overline{c}]$, the expected number of connections that j receives from i is

$$\frac{\pi \cdot E_{\varrho}\left[\mu\left(w_H|\upsilon\left(\kappa,\varrho\right)\right)\right]\left(1 + \varsigma \cdot E_{\varrho}\left[\theta\mu\left(\theta|\upsilon\left(\kappa,\varrho\right)\right)\right]\right)}{\overline{c}}$$

Since each additional connection to j results in profit of π for j, $\acute{j}$'s payoff for the game is

$$w_j - p_{\kappa} + E_{\varrho}\left[\mu\left(w_H|\upsilon\left(\kappa,\varrho\right)\right)\right]\left(\frac{\pi^2}{\overline{c}} + \frac{\pi^2}{\varsigma\overline{c}}E_{\varrho}\left[\theta\mu\left(\theta|\upsilon\left(\kappa,\varrho\right)\right)\right]\right) + d$$

where d is the expected payoff to j from monitoring activities undertaken by j, and w is invisible consumption. Note that d is independent of j's consumption choice. This is identical to (1), the reduced form for a consumer's utility function, with $r_W = \alpha\frac{\pi^2}{\overline{c}}$ and $r_C = \alpha\frac{\pi^2}{\varsigma\overline{c}}$.

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5 Appendix: Proofs

Lemma 1 All equilibria can be characterized as follows. Let $\kappa(\theta)$ be the mapping from type to consumption choice. Then there exists some $\theta^* \in [0,\infty]$ and $\theta^{**} \leq \theta^*$ such that either:

- $\kappa([0,\theta^{**}]) = \kappa_C$, $\kappa([\theta^{**},\theta^*]) = \kappa_\varnothing, \kappa([\theta^*,\infty]) = \kappa_D$, or
- $\kappa([0,\theta^{**}]) = \kappa_\varnothing$, $\kappa([\theta^{**},\theta^*]) = \kappa_C, \kappa([\theta^*,\infty]) = \kappa_D$.

Each of the intervals $[0,\theta^{**}]$, $[\theta^{**},\theta^*]$, $[\theta^*,\infty]$ may possibly have zero length.

Proof. Consider an equilibrium where type θ consumes conspicuously with probability $p_C(\theta)$, consumes discreetly with probability $p_D(\theta)$, and chooses $\kappa_\varnothing$ with probability $p_\varnothing(\theta)$. The expected return to $\kappa_\varnothing$ is

$$h_\varnothing(\theta) = \left(\frac{1}{1+\theta}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}\left(p_D(\theta')+p_\varnothing(\theta)\right)(r_W+r_C\theta')\,d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}\left(p_D(\theta')+p_\varnothing(\theta)\right)d\theta'}$$
$$+\left(\frac{\theta}{\theta+1}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}p_\varnothing(\theta)(r_W+r_C\theta')\,d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}p_\varnothing(\theta)\,d\theta'}$$

The expected return to consuming conspicuously is

$$h_C = r_W + r_C\frac{\int\theta' f(\theta')\,p_C(\theta')\,d\theta'}{\int f(\theta')\,p_C(\theta')\,d\theta'} - p.$$

The expected return to consuming discreetly is

$$h_D(\theta) = \frac{\theta}{\theta+1}\left(r_W + r_C\frac{\int\frac{\theta'^2}{1+\theta'}f(\theta')\,p_D(\theta')\,d\theta'}{\int\frac{\theta'}{1+\theta'}f(\theta')\,p_D(\theta')\,d\theta'}\right)$$
$$+\left(\frac{1}{1+\theta}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}\left(p_D(\theta')+p_\varnothing(\theta)\right)(r_W+r_C\theta')\,d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int\frac{f(\theta')}{1+\theta'}\left(p_D(\theta')+p_\varnothing(\theta)\right)d\theta'}$$
$$-p.$$

Note that the return to κ_C is invariant to θ while $h_\varnothing(\theta)$ and $h_D(\theta)$ are monotone in θ. More precisely, $h_D(\theta) - h_\varnothing(\theta)$ is monotone in θ, and $h_D(0) = h_\varnothing(0) - p$. Thus we can eliminate the possibility that θ chooses κ_D and θ' chooses $\kappa_\varnothing$ for $\theta' > \theta$.

More generally, at this point we can characterize equilibria as follows. There exist disjoint intervals $I_\varnothing, I_C$ and I_D such that $I_\varnothing \cup I_C \cup I_D = \mathbb{R}_0^+$ and type θ chooses action κ_η on interval I_η. If I_D has zero length, we are done; so we consider the case where positive mass of consumers choose

κ_D. Now, assume towards a contradiction that I_D (and thus $I_\varnothing$) lie to the left of I_C. $h_D(\theta)$ is increasing in θ. Then the following must hold:

That is,

$$\begin{aligned}
&\frac{\int_{I_D \cup I_\varnothing} \frac{f(\theta')}{1+\theta'} (r_W + r_C\theta')\, d\theta'}{\int_{I_D \cup I_\varnothing} \frac{f(\theta')}{1+\theta'} d\theta'} \\
&< E_F[r_W + r_C\theta] \\
&< \frac{\int_{I_C} f(\theta')(r_W + r_C\theta')\, d\theta'}{\int_{I_C} f(\theta')\, d\theta'}.
\end{aligned}$$

Recalling that $r_C\theta_L \leq r_W$, this then implies that

$$\begin{aligned}
h_D(0) &= \frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho\int_{I_D \cup I_\varnothing} \frac{f(\theta')}{1+\theta'}(r_W + r_C\theta')\, d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho\int_{I_D \cup I_\varnothing}\frac{f(\theta')}{1+\theta'} d\theta'} \\
&\quad -p \\
&< r_W + r_C\frac{\int_{I_C} f(\theta')(r_W + r_C\theta')\, d\theta'}{\int_{I_C} f(\theta')\, d\theta'} - p \\
&= h_C.
\end{aligned}$$

But this contradicts our assumption that I_D lies to the left of I_C. It follows that if θ' chooses κ_D and θ chooses κ_C, then $\theta' > \theta$.

We may thus characterize equilibria in the following way: let $\kappa(\theta)$ be the mapping from type to consumption choice. Then there exists some $\theta^* \in [0,\infty]$ and $\theta^{**} \leq \theta^*$ such that either:

- $\kappa((0,\theta^{**})) = \kappa_C$, $\kappa((\theta^{**},\theta^*)) = \kappa_\varnothing$, $\kappa((\theta^*,\infty)) = \kappa_D$, or
- $\kappa((0,\theta^{**})) = \kappa_\varnothing$, $\kappa((\theta^{**},\theta^*)) = \kappa_C$, $\kappa((\theta^*,\infty)) = \kappa_D$.

Note that each of the intervals $(0,\theta^{**})$, (θ^{**},θ^*), (θ^*,∞) may possibly have zero length. ■

Proposition 3 If ρ and p are sufficiently small, then a Veblen equilibrium exists.

Proof. Let

$$\begin{aligned}
g_\varnothing(\theta) &= \left(\frac{1}{1+\theta}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}(r_W + r_C\theta')\, d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'} d\theta'}, \\
g_C(\theta) &= r_W + r_C E_F[\theta' | \theta' < \theta] - p, \\
g_D(\theta) &= \frac{\theta}{\theta+1}\left(r_W + r_C\frac{\int_\theta^\infty \frac{\theta'^2}{1+\theta'} f(\theta')\, d\theta'}{\int_\theta^\infty \frac{\theta'}{1+\theta'} f(\theta')\, d\theta'}\right) + g_\varnothing(\theta) - p.
\end{aligned}$$

Any Veblen equilibrium threshold θ^* is characterised by

$$\begin{aligned}
g(\theta^*) &= g_D(\theta^*) - g_C(\theta^*) \\
&= \frac{\theta^*}{\theta^*+1}\left(r_W + r_C \frac{\int_{\theta^*}^{\infty} \frac{\theta'^2}{1+\theta'} f(\theta')\, d\theta'}{\int_{\theta^*}^{\infty} \frac{\theta'}{1+\theta'} f(\theta')\, d\theta'}\right) + g_{\varnothing}(\theta) \\
&\quad - (r_W + r_C E_F[\theta'|\theta' < \theta]) \\
&= \frac{\theta^*}{\theta^*+1}\left(r_W + r_C \frac{\int_{\theta^*}^{\infty} \frac{\theta'^2}{1+\theta'} f(\theta')\, d\theta'}{\int_{\theta^*}^{\infty} \frac{\theta'}{1+\theta'} f(\theta')\, d\theta'}\right) \\
&\quad + \left(\frac{1}{1+\theta^*}\right) \frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho \int_{\theta^*}^{\infty} \frac{f(\theta')}{1+\theta'}(r_W + r_C\theta')\, d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho \int_{\theta^*}^{\infty} \frac{f(\theta')}{1+\theta'} d\theta'} \\
&\quad - (r_W + r_C E_F[\theta'|\theta' < \theta^*]) \\
&= 0.
\end{aligned}$$

We seek to show that for ρ sufficiently small, $g(0) < 0$ and $\lim_{\theta\to\infty} g(\theta) > 0$. Next, we have

$$\begin{aligned}
g(0) &= \frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho E_F\left[\frac{r_W + r_C\theta}{1+\theta}\right]}{(1-\rho)\frac{1}{1+\theta_L} + \rho E_F\left[\frac{1}{1+\theta}\right]} - r_W \\
&\to_{\rho\to 0} r_C\theta_L - r_W < 0
\end{aligned}$$

so $g(0) < 0$ when ρ is sufficiently small. Also,

$$\begin{aligned}
&\lim_{\theta\to\infty} g(\theta) \\
&= \lim_{\theta\to\infty}\left[\frac{\theta}{\theta+1} r_C \frac{\int_{\theta}^{\infty} \frac{\theta'^2}{1+\theta'} f(\theta')\, d\theta'}{\int_{\theta}^{\infty} \frac{\theta'}{1+\theta'} f(\theta')\, d\theta'} + \left(\frac{1}{\theta+1}\right) \frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho \int_{\theta}^{\infty} \frac{f(\theta')}{1+\theta'}(r_W + r_C\theta')\, d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho \int_{\theta}^{\infty} \frac{f(\theta')}{1+\theta'} d\theta'}\right] \\
&\quad - r_C E_F[\theta'] \\
&= \infty.
\end{aligned}$$

Thus a solution to $g(\theta) = 0$ exists. It remains to show that at θ^*, $h_C > h_{\varnothing}(\theta)$ for all θ. Recall that

$$\begin{aligned}
h_{\varnothing}(\theta) &= \left(\frac{1}{1+\theta}\right) \frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho \int_{\theta^*}^{\infty} \frac{f(\theta')}{1+\theta'}(r_W + r_C\theta')\, d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho \int_{\theta^*}^{\infty} \frac{f(\theta')}{1+\theta'} d\theta'} \\
&\quad + \frac{\theta}{\theta+1} r_C\theta_L
\end{aligned}$$

and

$$h_C = r_W + r_C E_F[\theta'|\theta' < \theta^*] - p.$$

so $h_{\varnothing}(\theta)$ is decreasing in θ. Let θ^{**} be the solution to

$$\frac{\theta}{\theta+1}\left(r_W + r_C\frac{\int_\theta^\infty \frac{\theta'^2}{1+\theta'}f(\theta')\,d\theta'}{\int_\theta^\infty \frac{\theta'}{1+\theta'}f(\theta')\,d\theta'}\right)+\frac{1}{1+\theta}r_C\theta_L$$
$$-\left(r_W + r_C E_F\left[\theta'|\theta'<\theta\right]\right)=0.$$

Then as $\rho \to 0$, $\theta^* \to \theta^{**}$, so

$$\begin{aligned}&h_{\varnothing}(\theta^*)\\ &\to\left(\frac{1}{1+\theta^{**}}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int_{\theta^{**}}^\infty \frac{f(\theta')}{1+\theta'}\left(r_W + r_C\theta'\right)d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{\theta^{**}}^\infty \frac{f(\theta')}{1+\theta'}d\theta'}+\frac{\theta^{**}}{\theta^{**}+1}r_C\theta_L\\ &\to r_C\theta_L\end{aligned}$$

while $h_C \to r_W + r_C E_F\left[\theta'|\theta'<\theta^{**}\right]-p$, which exceeds $r_C\theta_L$ for $p < r_C E_F\left[\theta'|\theta'<\theta^{**}\right]$. Thus we have shown that $h_C > h_{\varnothing}$ when ρ and p are sufficiently small. It follows that an interior equilibrium exists. ■

Lemma 4 Assume that a Veblen equilibrium exists. A Veblen equilibrium with maximal θ^* exists and is the unique Pareto dominant interior equilibrium.

Proof. The existence of a Veblen equilibrium with maximal θ^* follows from the observation that $\lim_{\theta^*\to\infty} g(\theta^*)=\infty$.

Let $u_D(\theta,\theta^*)$ and $u_C(\theta,\theta^*)$ be the utility of type θ at the equilibrium θ^* from discreet and conspicuous consumption respectively. Let $u(\theta,\theta^*)=\max\{u_D(\theta,\theta^*),u_C(\theta,\theta^*)\}$.

Consider two equilibria, $\theta^* > \theta^{**}$. We claim that $u(\theta,\theta^*)\geq u(\theta,\theta^{**})$ for all θ, with strict inequality for some θ. It is easy to see that $u(\theta,\theta^*)\geq u(\theta,\theta^{**})$ for $\theta\leq\theta^*$ and for $\theta\geq\theta^{**}$. Then for $\theta\in(\theta^{**},\theta^*)$, we have

$$\begin{aligned}u(\theta,\theta^*)&=u_C(\theta,\theta^*)\\ &>u_D(\theta,\theta^*)\\ &>u_D(\theta,\theta^{**})\\ &=u(\theta,\theta^{**})\end{aligned}$$

by revealed preference. It follows that $u(\theta,\theta^*)\geq u(\theta,\theta^{**})$ for all θ. The result follows. ■

Proposition 5 Assume that a Veblen equilibrium exists. At the Pareto dominant Veblen equilibrium θ^*, we have (generically)

- $\frac{dF(\theta^*)}{dr_C}<0$.
- $\frac{dF(\theta^*)}{d\rho}>0$.

Proof. Recall that θ^* is the solution to

$$\begin{aligned} h(\theta) = & \frac{\theta}{\theta+1}\left(1+\frac{r_C}{r_W}\frac{\int_\theta^\infty \frac{\theta'^2}{1+\theta'} f(\theta')\,d\theta'}{\int_\theta^\infty \frac{\theta'}{1+\theta'} f(\theta')\,d\theta'}\right) \\ & +\left(\frac{1}{1+\theta}\right)\frac{(1-\rho)\frac{r_C}{r_W}\frac{\theta_L}{1+\theta_L}+\rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'} \\ & -\left(1+\frac{r_C}{r_W}E_F[\theta'|\theta'<\theta]\right) \\ = & \, 0. \end{aligned}$$

and that $\lim_{\theta\to\infty} h(\theta) = \infty$. Because θ^* is the maximum value of θ satisfying $h(\theta)=0$, this implies that $\frac{\partial h}{\partial \theta}\Big|_{\theta=\theta^*} > 0$ generically.

Now,

$$\begin{aligned} \frac{\partial h}{\partial r_C}\bigg|_{\theta=\theta^*} = & \frac{\theta^*}{\theta^*+1}\frac{1}{r_W}\frac{\int_{\theta^*}^\infty \frac{\theta'^2}{1+\theta'} f(\theta')\,d\theta'}{\int_{\theta^*}^\infty \frac{\theta'}{1+\theta'} f(\theta')\,d\theta'} \\ & +\left(\frac{1}{\theta^*+1}\right)\frac{(1-\rho)\frac{1}{r_W}\frac{1}{1+\theta_L}+\rho\int_{\theta^*}^\infty \frac{f(\theta')}{1+\theta'}\frac{1}{r_W}\theta' d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{\theta^*}^\infty \frac{f(\theta')}{1+\theta'}d\theta'} \\ & -\frac{1}{r_W}E_F[\theta|\theta<\theta^*], \end{aligned}$$

and a simple manipulation yields

$$h(\theta^*) = r_C\frac{\partial h}{\partial r_C}\bigg|_{\theta=\theta^*} + \frac{1}{\theta^*+1}\left(\frac{\rho\int_{\theta^*}^\infty \frac{f(\theta')}{1+\theta'}d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{\theta^*}^\infty \frac{f(\theta')}{1+\theta'}d\theta'}-1\right).$$

This implies $\frac{\partial h}{\partial r_C}\Big|_{\theta=\theta^*} > 0$, which implies

$$\frac{d\theta^*}{dr_C} = -\frac{\partial h/\partial r_C}{\partial h/\partial \theta^*} < 0.$$

Also,

$$\frac{\partial h}{\partial \rho} = \frac{\left\{ \begin{array}{c} \left[(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right]\left(-\frac{r_C}{r_W}\frac{\theta_L}{1+\theta_L} + \int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'\right) \\ -\left[(1-\rho)\frac{r_C}{r_W}\frac{\theta_L}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'\right]\left(-\frac{1}{1+\theta_L} + \int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right) \end{array} \right\}}{\left[(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right]^2}$$

$$= \frac{\left\{ \begin{array}{c} \int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta' \left[\begin{array}{c}(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta' \\ -\rho\left(-\frac{1}{1+\theta_L} + \int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right)\end{array}\right] \\ +\frac{r_C}{r_W}\frac{\theta_L}{1+\theta_L}\left[\begin{array}{c} -(1-\rho)\frac{1}{1+\theta_L} - \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta' \\ (1-\rho)\frac{1}{1+\theta_L} - (1-\rho)\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta' \end{array}\right] \end{array} \right\}}{\left[(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right]^2}$$

$$= \frac{\frac{1}{1+\theta_L}\left(\int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta' - \frac{r_C}{r_W}\theta_L\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right)}{\left[(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'\right]^2} > 0,$$

so

$$\frac{d\theta^*}{d\rho} = -\frac{\partial h/\partial \rho}{\partial h/\partial \theta^*} < 0.$$

Finally, $\frac{d\theta^*}{dr_C} < 0$ and $\frac{d\theta^*}{d\rho} < 0$ immediately imply $\frac{dF(\theta^*)}{dr_C} < 0$ and $\frac{dF(\theta^*)}{d\rho} < 0$. ■

Proposition 6 Let $\{F_1, F_2, F_3 ...\}$ be a sequence of distribution functions such that $\lim_{k\to\infty} E_{F_k}[\theta] = \overline{\theta}$ and $\lim_{k\to\infty} Var_{F_k}[\theta] = 0$. Then $\lim_{k\to\infty} F_k\left(\theta^*_{F_k}\right) = 1$.

Proof. Recall that $\theta^*_{F_k}$ is the maximal root of

$$\begin{aligned} h(\theta) = & \frac{\theta}{\theta+1}\left(1 + \frac{r_C}{r_W}\frac{\int_\theta^\infty \frac{\theta'^2}{1+\theta'}f(\theta')d\theta'}{\int_\theta^\infty \frac{\theta'}{1+\theta'}f(\theta')d\theta'}\right) \\ & + \left(\frac{1}{1+\theta}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'}{(1-\rho)\frac{1}{1+\theta_L} + \rho\int_\theta^\infty \frac{f(\theta')}{1+\theta'}d\theta'} \\ & - \left(1 + \frac{r_C}{r_W}E_F[\theta'|\theta' < \theta]\right) \end{aligned}$$

Note that as $k \to \infty$, $F_k^{-1}(\lambda) \to \overline{\theta}$ for given $\lambda \in (0,1)$. We claim that $\lim_{k\to\infty} E_{F_k}\left[q(\theta)|\theta > F_k^{-1}(\lambda)\right] = q\left(\overline{\theta}\right)$, where $q(\cdot)$ is any quadratic function. To see this, note that

$$\begin{aligned}
&E\left[\left(\theta-\overline{\theta}\right)^2\right]\\
&=\lambda E\left[\left(\theta-\overline{\theta}\right)^2|\theta<F_k^{-1}(\lambda)\right]\\
&\quad+(1-\lambda)E\left[\left(\theta-\overline{\theta}\right)^2|\theta>F_k^{-1}(\lambda)\right]\\
&\to_{k\to 0}0,
\end{aligned}$$

so we must have $E\left[\left(\theta-\overline{\theta}\right)^2|\theta>F_k^{-1}(\lambda)\right]\to_{k\to 0}0$. This in turn implies $E\left[\theta-\overline{\theta}|\theta>F_k^{-1}(\lambda)\right]\to_{k\to 0}0$. Our claim follows. This result allows us to pick a sequence $\left\{\theta^+(k)\right\}_k$ such that

$$\begin{aligned}
\lim_{k\to\infty}\theta^+(k)&=\overline{\theta},\\
\lim_{k\to\infty}F\left(\theta^+(k)\right)&=1,\\
\lim_{k\to\infty}E_{F_k}\left[q(\theta)|\theta>F_k^{-1}(\lambda)\right]&=q\left(\overline{\theta}\right),\\
\lim_{k\to\infty}E_{F_k}\left[q(\theta)|\theta<F_k^{-1}(\lambda)\right]&=q\left(\overline{\theta}\right).
\end{aligned}$$

Fix $\lambda\in(0,1)$. We claim that for sufficiently large k, $h\left(F_k^{-1}(\lambda)\right)<0$. We have

$$\begin{aligned}
h\left(F_k^{-1}(\lambda)\right)=&\frac{F_k^{-1}(\lambda)}{F_k^{-1}(\lambda)+1}\left(1+\frac{r_C}{r_W}\frac{\int_{F_k^{-1}(\lambda)}^{\infty}\frac{\theta'^2}{1+\theta'}f(\theta')\,d\theta'}{\int_{F_k^{-1}(\lambda)}^{\infty}\frac{\theta'}{1+\theta'}f(\theta')\,d\theta'}\right)\\
&+\left(\frac{1}{1+F_k^{-1}(\lambda)}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}d\theta'}\\
&-\left(1+\frac{r_C}{r_W}E_F\left[\theta'|\theta'<F_k^{-1}(\lambda)\right]\right).
\end{aligned}$$

The first term is

$$\begin{aligned}
&\frac{F_k^{-1}(\lambda)}{F_k^{-1}(\lambda)+1}\left(1+\frac{r_C}{r_W}\frac{\int_{F_k^{-1}(\lambda)}^{\theta^+(k)}\frac{\theta'^2}{1+\theta'}f(\theta')\,d\theta'+\int_{\theta^+(k)}^{\infty}\frac{\theta'^2}{1+\theta'}f(\theta')\,d\theta'}{\int_{F_k^{-1}(\lambda)}^{\theta^+(k)}\frac{\theta'}{1+\theta'}f(\theta')\,d\theta'+\int_{\theta^+(k)}^{\infty}\frac{\theta'}{1+\theta'}f(\theta')\,d\theta'}\right)\\
&\to_{k\to\infty}\frac{\overline{\theta}}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\frac{\int_{F_k^{-1}(\lambda)}^{\theta^+(k)}\frac{\overline{\theta}^2}{\overline{\theta}+1}f(\theta')\,d\theta'+\int_{\theta^+(k)}^{\infty}\frac{\theta'^2}{1+\theta'}f(\theta')\,d\theta'}{\int_{F_k^{-1}(\lambda)}^{\infty}\frac{\theta'}{1+\theta'}f(\theta')\,d\theta'}\right)\\
&\leq\frac{\overline{\theta}}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\frac{(1-\lambda)\frac{\overline{\theta}^2}{\overline{\theta}+1}+\overline{F}\left(\theta^+(k)\right)E\left[\theta'|\theta'>\theta^+(k)\right]}{\frac{\overline{\theta}}{\overline{\theta}+1}(1-\lambda)}\right)\\
&=\frac{\overline{\theta}}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\overline{\theta}\right).
\end{aligned}$$

The second term is

$$\begin{aligned}
&\left(\frac{1}{1+F_k^{-1}(\lambda)}\right)\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}d\theta'}\\
&=\frac{1}{\overline{\theta}+1}\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\left(\int_{F_k^{-1}(\lambda)}^{\theta^+(k)}\frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'+\int_{\theta^+(k)}^{\infty}\frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'\right)}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}d\theta'}\\
&\to_{k\to\infty}\frac{1}{\overline{\theta}+1}\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\left(\frac{1-\lambda}{1+\overline{\theta}}\left(1+\frac{r_C}{r_W}\overline{\theta}\right)+\int_{\theta^+(k)}^{\infty}\frac{f(\theta')}{1+\theta'}\left(1+\frac{r_C}{r_W}\theta'\right)d\theta'\right)}{(1-\rho)\frac{1}{1+\theta_L}+\rho\int_{F_k^{-1}(\lambda)}^{\infty}\frac{f(\theta')}{1+\theta'}d\theta'}\\
&\leq\frac{1}{\overline{\theta}+1}\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\left(\frac{1-\lambda}{1+\overline{\theta}}\left(1+\frac{r_C}{r_W}\overline{\theta}\right)+\overline{F}\left(\theta^+(k)\right)E\left[1+\frac{r_C}{r_W}\theta'|\theta'>\theta^+(k)\right]\right)}{(1-\rho)\frac{1}{1+\theta_L}+\rho\frac{1-\lambda}{\overline{\theta}+1}}\\
&\to_{k\to\infty}\frac{1}{\overline{\theta}+1}\frac{(1-\rho)\frac{r_C\theta_L}{1+\theta_L}+\rho\frac{1-\lambda}{1+\overline{\theta}}\left(1+\frac{r_C}{r_W}\overline{\theta}\right)}{(1-\rho)\frac{1}{1+\theta_L}+\rho\frac{1-\lambda}{\overline{\theta}+1}}\\
&<\frac{1}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\overline{\theta}\right).
\end{aligned}$$

Finally, the third term is

$$\begin{aligned}
&-\left(1+\frac{r_C}{r_W}E_F\left[\theta'|\theta'<F_k^{-1}(\lambda)\right]\right)\\
&\to_{k\to\infty}1+\frac{r_C}{r_W}\overline{\theta}.
\end{aligned}$$

Putting the three terms together, we get

$$\begin{aligned}
&\lim_{k\to\infty}h\left(F_k^{-1}(\lambda)\right)\\
&<\frac{\overline{\theta}}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\overline{\theta}\right)+\frac{1}{\overline{\theta}+1}\left(1+\frac{r_C}{r_W}\overline{\theta}\right)-\left(1+\frac{r_C}{r_W}\overline{\theta}\right)\\
&=0.
\end{aligned}$$

Since $\lim_{\theta\to\infty}h(\theta)=\infty$, we may infer that for sufficiently large k, $\theta^*_{F_k}>F_k^{-1}(\lambda)$. Since our choice of λ was arbitrary, we may conclude that $\lim_{k\to\infty}F_k\left(\theta^*_{F_k}\right)=1$. ■

5.1 Copley Mall

One of the coauthors and a research assistant traveled to the Copley Mall in order to examine status goods and compare prices. We looked for pairs of goods which were identical except for the pattern printed on the fabric. I assume a pattern covered in brand logos to be more "conspicuous" in the sense that a larger number of observers will identify the item as expensive. In many cases, identical shoe and bag designs featured different patterns and different fabrics, and, in every such case, the logo-free shoes and bags were made of a more expensive fabric (in one case, we asked the clerk at the Gucci store why the logo-free shoes were $720, while the logo-printed shoes were only $405, and the answer was that the logo-free shoes were made of ostrich).

Brand	*Style*	*Logo Price*	*No Logo Price*
Louis Vuitton	Slingback	$600	$640
	Sandal	$335	$445
	Driving Loafer	$575	$585
Gucci	Duffel Bag	$750	$1750
	Bag	$1200	$1100
	Shoe	$485	$495
	Shoe	$495	$535
	Shoe	$405	$740
	Slide	$405	$420
	Ballet Slipper	$410	$420
	Men's Loafer	$375	$340
	Men's Belt	$285	$260
Fendi	Bag	$1800	$2120
	Bag	$900	$1220
Ferragamo	Moccasin	$310	$340
Coach	Bag	$398	$458
	Bag	$178	$198
	Bag	$648	$698
	Tennis Shoe	$88	$98