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“Social Norms and Preferences”
Chapter for the Handbook for Social Economics
Edited by J. Benhabib, A. Bisin and M. Jackson

by

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Social Norms and Preferences,^{*†}
Chapter for the *Handbook for Social Economics*
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Abstract

Social norms are often posited as an explanation of differences in economic behavior and performance of societies that are difficult to explain by differences in endowments and technology. Economists are often reluctant to incorporate social aspects into their analyses when doing so leads to models that depart from the “standard” model. I discuss ways that agents’ social environment can be accommodated in standard models and the advantages and disadvantages of doing so.

Keywords: Social norms, social preferences, interdependent preferences, social behavior

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[†]This paper draws heavily on Postlewaite (1998) and Mailath and Postlewaite (2003), and there is substantial overlap in the discussions there and in this paper.

1. Introduction¹

There is little agreement about what exactly social norms are and how they might be modelled. The term is often used to describe situations in which there is a commonality in behavior in a group of people. Not every observed commonality is a candidate for the term however. No one would describe as a social norm the fact that family members regularly eat together. The term is reserved to describe similar behavior within a group that might have been otherwise, that is, behavior that differs from that of a larger population. But even this is not sufficient to delineate what should or should not be included as a social norm. We wouldn't say that it is a social norm that Eskimos wear warmer clothes than do Guatemalans. We understand that it is only rational, given the climate, that Eskimos dress differently than others. So a minimal criterion for a behavior in a group to be considered a social norm is that it cannot be explained simply as a consequence of optimization to the group's physical environment. I will use the term social norm to describe the behavior of a group if the behavior differs from that of other groups in similar environments. The aim of this paper is to clarify how we can model and analyze social norms that generate differences in economic behavior and performance across similar societies.

Most economic analyses begin with an individual agent whose preferences are taken as given. Those preferences determine the agent's choice, and a society's economic behavior is obtained by aggregating the choices of agents in the society. Aggregating the decisions agents in isolation make in this way leaves little room for investigating how the social environment in which agents make decisions affects those decisions: Two communities whose composition and physical environments are the same would necessarily yield the same aggregate behaviors. Yet we often observe groups in similar circumstances behaving quite differently. There are Amish communities in which no house has electricity and there are no automobiles or cell phones that abut "standard" towns in which people live like you and I. What accounts for the wildly different lifestyles? A genetic predisposition to horse and buggy transportation seems unlikely, and many people attribute the difference to differing social norms. The Amish example suggests that it would be foolish to estimate an agent's elasticity of demand for electricity without looking at the social characteristics of the community in which he or she resides.

¹This paper is a discussion of how one can accommodate social aspects of a society in an economic analysis. I will discuss a number of papers to illustrate the points that I want to make, but the paper is not a survey of any particular area.

Social characteristics of a community are important not only for understanding differences across communities, but for understanding decisions within a single community as well. It is commonplace to note that many people are affected by the consumption of others in their buying decisions. Whether it is cars, clothing, housing or jewelry, if everyone around spends more, you are tempted to spend more as well. The term “keeping up with the Jones” generates nearly fifteen million hits on Google. An analysis that ignores the social context in which many consumption decisions are made will necessarily be incomplete.

Most economists understand that the social milieu affects peoples’ behavior but are reluctant to incorporate such concerns in their models. Models that include them often allow such a broad range of behavior that there are few, if any, restrictions on equilibrium behavior and, hence, such models have little or no predictive power. Economics is among the most successful social sciences, due in no small part to the modelling methodology employed. Economic models traditionally build on individual maximizing behavior with the (often implicit) assumption that individuals’ utility depends on a quite limited set of arguments.

Thus, there is a tension between the standard methodology of economic modelling and the ability of economic models to capture important effects of the social environment on economic behavior.² When we observe very different economic outcomes in societies that are composed of people who are fundamentally the same and who have similar endowments and have access to the same technology, it is profitable to explore how the social environments in those societies differ.

A successful integration of social concerns into existing economics should maintain individual optimization; one should not simply posit that there is a social norm in the Amish community that individuals should eschew modern conveniences, and that the Amish blindly follow this norm.³ It is trivial, however, to support observed behavior without abandoning optimization – simply posit that one has a preference for following a particular social norm.⁴ One might posit a norm to cooperate in the prisoners’ dilemma if one observed such cooperation, but

²See, e.g., Akerlof (1984), particularly the introduction, for a discussion of the tension.

³Other disciplines often take adherence to social norms as given. For an economist’s survey of the work on social norms by sociologists, see Weiss and Fershtman (1998); for a somewhat different take on this issue by economists, see Burke and Young, this volume.

⁴However, even the simple assumption that an individual’s choice can be taken to be his preference might be called into question. For example, there is a substantial literature on peoples’ desire to commit to future behavior in the belief that they would otherwise make unwise decisions. See the DellaVigna (2009) *JEL* survey for a discussion of this.

this is not very productive.⁵ As mentioned above, economics has been relatively successful among the social sciences because of the restrictions imposed by the assumptions of the models employed. Models can have predictive power only to the extent that some behavior is inconsistent with the predictions of the model. The central assumption in economics of rational self-interested agents puts no restrictions on behavior unless there are simultaneous restrictions on what might be in agents' self interest. The force of the rational-agent assumption in economics derives from concurrent restrictions on preferences. In interesting economic models, agents' preferences are either unchanging over time, or change in a very structured way depending on history. Similarly, most economic models restrict agents' preferences so that they depend on goods and services consumed by them or their offspring.⁶

The aim of this paper is to describe how economists can incorporate social aspects of societies to understand why we might see very different behavior and economic performance in fundamentally similar societies. There may seem to be a contradiction between saying that the people in two communities are “fundamentally similar”, and yet behave differently. There is no contradiction if “fundamentally similar” agents can have different preferences, and I will discuss in the next section how “fundamentally similar” agents may have different preferences and make different choices depending on the social structure of their society. One possibility is that two people may be the same at birth, but that their preferences are shaped by their interactions with others within their different societies as they grow up, so that by the time they are old enough to make economically interesting decisions, what makes them happy or sad is very different. A second possibility is that two people may have the same “deep preferences”⁷, but that the social structures they inhabit provide different future rewards for a given behavior. Preferences over whether to study the Talmud or play baseball likely differ systematically across societies. This is, of course, because the future consequences of the decision differ across societies, and preferences should not depend only on the single decision of which of the two activities to engage in, but over the entire paths that the activities lead to. The point is that different people may have the same deep preferences but different reduced form preferences, where what I mean

⁵I support this view in more detail below.

⁶There are exceptions, of course; see, e.g., Duesenberry (1949), Frank (1985), and Robson (1996), who considers a possible biological basis for such interdependence.

⁷Roughly speaking, what I mean by deep preferences are the things that directly activate pleasurable brain activity.

by reduced form preferences is the preferences over the immediate alternatives.

Differing preferences for studying the Talmud and playing baseball in different communities suggests multiple equilibria, and multiplicity of equilibria will indeed play a role in my discussion below. We are familiar with multiple equilibria in the basic models in economics; Arrow-Debreu economies with complete markets can have multiple equilibria, but it is difficult to see how that multiplicity might be thought of in terms of social norms. We will see that *incomplete* markets will be an important ingredient in the relationship between social norms and multiple equilibria.

I discuss in the next section how fundamentally similar people can have different preferences due either to differences in how their social environments shaped their deep preferences or differences in how their social environments generated different reduced form preferences. Following this, I lay out a model illustrating how different social environments can affect growth rates in a more or less standard dynastic growth model. Using the discussion of that model, I discuss the advantages and disadvantages of the modelling methodology.

2. The social determinants of preferences

Standard economic models typically exclude feelings of affection, envy, and rivalry. Most (perhaps all) economists understand that these restrictions on preferences are unrealistic. There are two primary reasons that economists continue to utilize models that exclude such considerations. First, adding variables that affect individuals' utility weakens the conclusions that can be drawn from the analysis. Second – and in my opinion more important – is that economists have been extremely successful in their attempt to “explain” human behavior using economic models without including such variables. Becker (1976) said this very nicely – “[the] combined assumptions of maximizing behavior, market equilibrium and stable preferences, used relentlessly and unflinchingly ... provides a valuable unified framework for understanding all human behavior” (cf. Becker (1976), page 5).

This, of course, isn't an argument that other things won't improve our ability to model and understand some aspects of human behavior; rather, it is an argument for pushing the traditionally restricted models in new directions to see how well we can describe human behavior with such simple models. The rational-agent model of optimizing agents with stable preferences has been fruitfully brought to bear on a wide variety of decisions including marriage and criminal behavior (cf. Becker (1976)). Research using the model for these problems has proven extremely

useful despite substantial initial skepticism of its appropriateness. It is important to understand that applying the rational-agent model to a particular problem does not entail a belief that it is the *only*, or even the most accurate, model of behavior in that setting. What is important is that the model may give us insights that we would miss had we not used the model.

My aim in this paper is to discuss ways that we can incorporate social influences on economic behavior while maintaining the standard modeling restrictions that agents optimize and what might be included as arguments of agents' utility functions. If similar optimizing agents make different choices, they must have different preferences. Social forces can result in fundamentally similar agents having different preferences in two conceptually different ways. I turn to these next.

2.1. Internalized preferences

Don't worry that children never listen to you; worry that they are always watching you. Robert Fulghum

The first, and simplest, way that social forces can affect behavior is through the formation of agents' preferences. Although the bulk of economic analysis takes preferences as exogenously given, for much of the behavior that this paper addresses, preferences are to some degree socially determined in the sense that agents internalize preferences in some domains that reflect those of the society they inhabit. The consequence of this internalization is that agents' deep preferences are influenced by their social environment.⁸

We observe a vast range of behavior that seems not in one's narrow self-interest but easily understood in terms of internalized preferences that are the result of indoctrination.⁹ I don't take a pen off my colleague's desk when she is out of the office even when I am positive I won't be caught. If I were asked why, I would simply say that I would feel bad about myself if I did that. I was brought up to not take other peoples' things (at least not of small value), not to make fun of handicapped people, to tip in restaurants, and to respond positively to requests for small favors. Very likely, the indoctrination took the form of my mother's approval when I behaved in ways she felt appropriate and disapproval when I

⁸On this point, see also the discussion in Bowles (1998).

⁹While I focus in this section on indoctrination of children, Yoram Weiss pointed out to me that the formation of internalized preferences does not occur solely in children. A few months of military training seems to dramatically alter the deep preferences of young adults so that they are willing to kill and be killed in ways that would have been inconceivable before training.

did not. As with Pavlov’s dog my internal chemistry continues to respond to the external stimuli long after the associated consequences have disappeared.

This is not a novel point of view; as parents we spend large amounts of time, energy and money in the belief (or at least the hope) that we can shape our children’s preferences, that they will be future-oriented, like classical music and support their parents in old age. The view has been canonized in the motto attributed to Francis Xavier “Give me a child until he is seven and I will give you the man”.

It is immediate that endogenizing preferences can lead to differences in behavior across groups. If individuals in one group are indoctrinated to “enjoy” work and saving while those in another group are indoctrinated to dislike work, we would expect to see significant differences in behavior between the groups. Weber (cf. Weber (1905) made the argument that religion was one (of many) of the reasons that western cultures differ from eastern cultures. There is a recent literature in economics rooted in the notion that peoples’ preferences are shaped by the environment in which they are raised.¹⁰

Bisin and Verdier (2000) analyze a model of cultural transmission in which parents wish to transmit their own traits to offspring and make costly efforts to socialize them, such as spending time with children, attending church, and choosing specific neighborhoods to live in. When parents are of different backgrounds, each parent wishes to transmit his/her own trait to the children. The child’s preferences are then determined by the interaction of parents’ efforts and the indirect influence of society toward assimilation. Bisin, Topa and Verdier (2004) use this basic idea to carry out an empirical analysis of parental transmission of religious beliefs.¹¹

Fernandez, Fogli and Olivetti (2004) suggest that the environment in which men are raised have lasting effects on their preferences. They find that whether a man’s mother worked while he was growing up is correlated with whether his wife works, even after controlling for a whole series of socioeconomic variables. They interpret this as preference formation on the men’s part – growing up with a working mother affected their preferences for a working wife. Fernandez and Fogli (2005) analyze how fertility and work decisions of second-generation American women were affected by their country of origin. Fernandez and Fogli argue that the cultures of the country of origin with respect to these decisions predict the

¹⁰See Benhabib and Bisin (2010) for a discussion of how advertising shapes preferences.

¹¹See also Bisin and Verdier (2010) for discussion of this line of work.

choices made by the second-generation women.¹²

These papers illustrate how individuals can be acculturated by the society they are in, that is, how their preferences are shaped by the behavior of those they come in contact with. We can distinguish between two different acculturation processes, which we might call active and passive. Acculturation is active when the behaviors that shape the preferences of the young are consciously chosen with the aim to form those preferences in a particular way. Acculturation is passive when the individuals whose behavior shapes the preferences of the young have no particular interest in what preferences might emerge. Men whose mothers worked might be more comfortable with working wives simply because it seems natural, without their mothers having this as a conscious aim, that is, acculturation is passive, while the Jewish parents in Scarsdale who send their children to Hebrew school are engaged in active acculturation.

The distinction is useful because active acculturation typically involves people making costly efforts to affect the preferences of the young, leading to the question of what the payoffs are to these costly efforts. Parents desire that their children be like them, but this is not the sole motivation for the effort they make to shape their children's values and preferences. There is clearly an interest in socializing children so that they will be successful. What constitutes success is defined by parents, while what contributes to that success often depends on the community in which the child will live. Tabellini (2008) analyzes a model in which parents rationally choose how to indoctrinate their children. Their choices are guided by external enforcement of behaviors and likely transactions their children will engage in.¹³ In such a setting, parents' optimal choices may well depend on the choices of other parents. Your child may do well being cooperative when he will interact primarily with others who are cooperative, but be exploited if others are not. In general, with active acculturation, families don't face an individual decision problem, but instead are in a game.

This discussion avoids several important issues when examining how social influences affect the formation of preferences. First, suppose that parents actively work to shape their children's preferences. How do parents choose what preferences they desire their children to have? For problems such as investigated by Bisin et al. (2004), we should feel reasonably comfortable assuming that parents

¹²See also Fernandez (2007a, 2007b, 2010) for a general discussion of cultural formation and transmission of preferences.

¹³See also Lizzeri and Siniscalchi (2008) for a model in which parents rationally shape their children's decision making process.

want their children to adopt the parents' religion, at least when parents share the same religion.

Considering parents' preferences over the preferences they induce in their children can be more complicated in other problems. We might think that parents want to indoctrinate their children to be honest. This may represent *deep* preferences on the parents' part that their children be honest, or it might be their deep preferences are that their children be successful and that honest children simply do better in life. While it might be the case that in some social settings it is indeed the case that being congenitally honest is beneficial, there may be others in which it is costly (as Lear's daughter Cordelia learns). Parents' choices about what preferences to instill in their children may depend on other parents' choices.¹⁴ All parents in one group may raise their children to be cooperative while those in another place raising selfish children, with any set of parents in either place making an optimal choice given the choices of others.

Examining how deep preferences are shaped within a society can provide structure to a deeper understanding of differences in economic performance across societies.¹⁵ It would be interesting to examine *why* different deep preferences arise in different societies: Is it different parental preferences about their children's preferences or is it that particular deep preferences have different values depending on others' deep preferences?

2.2. Reduced form preferences

The work described above investigates why we might see individuals optimally behaving very differently when in different groups, even if those groups are in very similar physical environments. As I discussed, the interpretation is that the variation in behavior is a consequence of the individuals in different groups having different preferences. At one level, this must be true if we identify the choices people make with their preferred alternatives. But we need to be cautious about what we mean when we say that an individual "prefers" one thing to another. I came to work today, so by this logic I must prefer working to staying home. Obviously, this doesn't mean that I necessarily like work more than leisure, but rather I prefer working today to staying home primarily because the future consequences

¹⁴Corneo and Jeanne (2009) analyze a model in which parents choose what value systems to instill in their children to maximize their children's expected utility.

¹⁵See, e.g., Fershtman, Hvide and Weiss (2003) for an argument about how the form of executive compensation is affected by CEO's concerns about their compensation relative to other CEO's..

of the alternatives are very different. I came to work today because it is part of an equilibrium for which the consequences of “coming to work” and “staying home” differ: they pay me if I come to work, but not otherwise. What we can say is that I have “reduced-form” preferences over my actions today such that working today is preferred to staying home *given the equilibrium in my environment*. My “deep” preferences – that is, my preferences over working versus staying home might be quite different. Holding fixed the actions of all other people (including paying me whether I show up for work or not), I might well prefer staying home. When I talk about an individual’s “preferences”, it is important to be clear whether I am talking about his reduced form preferences or his deep preferences where deep preferences are preferences over immediate alternatives, *assuming that the choice doesn’t trigger a response from others*. My deep preferences are that I stay home and watch Oprah Winfrey today, while my reduced form preferences that take into account changes in others’ actions given my choice are to come to work.¹⁶

In this taxonomy of deep and reduced form preferences, the internalized preferences discussed in the previous section are deep preferences. I don’t take the pen from a colleague’s desk, even if I am positive I will not be caught, and I will feel bad making fun of a handicapped individual independent of any future consequences. One should think of the internalized preferences as consequence of indoctrination resulting in a permanent change in the brain activity associated with a particular act.

It may be clear in some problems that preferences are socially influenced, but not obvious whether the socially influenced preferences are internalized preferences or reduced form preferences. Consider for example the Fernandez et al. (2004) paper discussed above that demonstrated that the wives of men whose mothers worked are more likely to work. One possibility is that this reflects internalized preferences whereby there is a negative emotion generated in a man whose mother did not work if his wife works, but a positive emotion in a man whose mother worked. Alternatively, it might be that men whose mothers worked mate with women from a different pool than men whose mothers didn’t work. It may be that men whose mothers worked come in contact primarily with women who insist on working as a condition of marriage, while men whose mothers didn’t work make no such demand. All men may experience a negative emotion if their wives work,

¹⁶Distinguishing between “deep preferences” and “reduced form preferences” can be useful, but I don’t want to suggest that all choice problems will fall neatly into one or the other category. For example, if I was deciding whether or not to burn down my employer’s factory, I would find it hard to think about the choices “holding fixed all other agents’ actions”.

but the reduced form preferences of men whose mothers worked lead to matches with women who work.

It might seem irrelevant whether the change in men’s preferences is internalized or reduced form since in either case we have the same outcome – whether a man’s mother worked is related to whether his wife works. But the distinction is important. In the case of internalized preferences described above, a woman married to a man whose mother worked is doing him a favor, while in the hypothetical reduced form case, the man is doing a favor for his wife by “letting her work”. One would presumably analyze some questions differently in the two cases, for example, bargaining within the family. Additionally, the predicted response in a woman’s labor supply decision to a wage change might be different in the two circumstances.¹⁷ I next give a detailed example of how reduced form preferences might exhibit a concern for rank in the wealth distribution when there is no concern in the deep preferences.

3. Reduced form preferences: Social concerns

3.1. Reduced form social preferences

In this section I’ll set out a model that illustrates how agents’ reduced form preferences can differ in important ways across economies that are identical in all respects except that the equilibrium behavior in the economies differ. In particular, I will demonstrate how people whose deep preferences are completely standard in the sense that they care only about their own consumption and the utility of their children, but whose reduced form preferences exhibit a concern for relative standing.¹⁸

Cole, Mailath and Postlewaite (1992) (hereafter CMP92) augments a standard growth model with a matching decision between men and women. They assume that individuals care only about their own consumption and their offsprings’ util-

¹⁷I will return to the advantages of using the framework of reduced form preferences for many problems below.

¹⁸Some sociologists suggest something like an instrumental argument for why status is important, namely that it provides one with a claim to good treatment from others. This begs the question of why others would give this good treatment. One possible answer is that high status can serve as a coordinating device. That is, high status people may be able to cooperate better when they interact than do others. (See, e.g., Brooks (2001), Okuno-Fujiwara and Postlewaite (1995), and Fershtman and Weiss (1998a, 1998b)).

ity, and that after matching, all consumption within a pair is joint.¹⁹ To the extent that members of either sex have different wealth levels, the joint consumption induces preferences over potential mates: all other things equal, wealthier mates are more desirable.

Since wealthier mates are desirable, a natural process by which men and women might match is that the wealthiest women match with the wealthiest men, that is, the matching process could be positively assortative on wealth. It's clear that this nonmarket matching decision induces a concern for relative wealth: individuals' consumption depends not only on their own endowment, but their position in the wealth distribution of people of the same gender. This concern for relative standing is not in the deep preferences, but is induced in the reduced form preferences because relative standing in the wealth distribution affects individuals' consumption of ordinary goods. Consumption is affected because the obtainable mates depend on one's wealth relative to competitors' in the mating contest. Individuals have a concern for relative standing because relative standing is instrumental in determining ultimate consumption levels.

I will describe the model in more detail next.

3.2. Basic model²⁰²¹

There are two types of one-period-lived agents, men and women. The agents match into pairs with each pair having two offspring, one male and one female. In addition to the matching decision, agents make standard economic decisions: how to divide their endowment into their own consumption and a bequest to their offspring. Consumption is joint, so agents care about the economic characteristics of potential mates. Men and women are treated asymmetrically in two respects in order to reduce the technical complexity of the model.

First, women are endowed with a nontraded, non-storable good, while men inherit a second, storable good which is called capital. Women are indexed by $j \in [0, 1]$ and woman j is endowed with j units of the non-traded good. The men are indexed by $i \in [0, 1]$ and are exogenously endowed with capital in the first period.²²

¹⁹It isn't important that *all* consumption is joint, only that there is some joint consumption.

²⁰The material in this section is taken from Cole, Mailath and Postlewaite (1992) and Postlewaite (1998).

²¹See Corneo and Jeanne (1997, 2001) and Fershtman, Murphy and Weiss (1996) for related models.

²²Males and females are treated differently only for reasons of tractability.

Second, only the welfare of the male offspring enters the pair's utility function; consequently, parents only make bequests to their sons. A male offspring inherits his father's index, and I will refer to man i , his son, his son's son, and so on, as family line i . Men and women have identical utility functions defined over joint consumption of a matched pair's bundle given by $u(c) + j$, where c and j are, respectively, the quantities of the male and the female goods. Finally, the utility level of their son enters linearly into each parent's utility function, discounted by $\beta \in (0, 1)$.

The problem facing a couple is, given their wealth (determined by the bequest from the male's parents), how much to consume and how much to bequeath to their son. Their son values the bequest for two distinct reasons. First, it affects the amount he and his descendants can consume and, second, the bequest may affect the quality of his mate. To the extent that their son's match is affected, parents may have an incentive to leave a larger bequest than they otherwise would. Matching is voluntary in the sense that no unmatched man and woman could both improve their situation by moving from their current match. Both men and women prefer wealthier partners, all else equal. It may be, however, that matching with a wealthy partner has adverse implications for the matching prospects of male descendants. For example, they may be punished if their parents deviated from prescribed behavior.

Agents use capital for current consumption and savings. Output is produced according to

$$c = Ak - k',$$

where k is the initial endowment capital, c is first period consumption, k' is second period capital, and $A > 1$ is a constant. The initial endowment of capital for men in the first period is $k_1 : [0, 1] \rightarrow R_+$.

3.2.1. Two period example

I can illustrate the instrumental nature of concern for wealth with a two period version of the model described above. Matching will take place in the second period only. Assume that $k_1(\cdot) = k$, i.e., all men have the same initial endowment. Assume that all men have utility function

$$u(c_0) + \beta(u(c_1) + j)$$

where c_0 and c_1 denote respectively the parents' and their son's consumption of the male good and j denotes the endowment of the son's mate.

I assume agents act strategically. Men and women in the second period will maximize their utility, aiming to match with the wealthiest person on the other side of the matching market. Consequently, that matching will be assortative on wealth: the m^{th} percentile male with respect to wealth will match with the m^{th} percentile woman with respect to female endowment. A man's match in the second period thus depends only on his relative position in the wealth distribution in period 2. An equilibrium is a description of the consumption-savings decisions of the men in the first period and matching behavior of the men and women in the second period such that no agent has an incentive to deviate from the described behavior.

Since all men in the first period have the same initial wealth and can mimic the decisions of any other man, they must all have the same utility. This is not the case for men in the second period, however. It cannot be the case that bequests to a positive measure of sons is identical. If this were the case, some man would be matched with a woman whose endowment is less than that of a woman matched with a man with the same size bequest by an amount $d > 0$. But then the father of the man whose son matched with the poorer woman could increase his bequest by an arbitrarily small amount, which would ensure that the endowment of the woman in the new match was greater by at least d .

An equilibrium will be a function giving the bequests of each first period man, $k_1 : [0, 1] \rightarrow R$ where $k_1(i)$ is the i^{th} father's bequest, where $k_1(i)$ is optimal for father i given other families' choices. Given $k(\cdot)$, let $F(k)$ be the CDF for k , i.e., $F(k)$ is the proportion of families with bequest less than or equal to k .

Then for all i

$$k(i) \in \arg \max u(Ak - k(i)) + \beta[u(k(i)) + F(k(i))]$$

since $F(k(i))$ is the rank in the wealth distribution, so that $F(k(i))$ is the index of the woman i will match with, and hence, the endowment of his mate. The first order conditions for family i are then (assuming $F(\cdot)$ is differentiable):

$$u'(Ak - k(i)) = A\beta u'(Ak(i)) + \beta F'(k(i)).$$

Comparing the first order conditions of a father's bequest decision when that decision affects the son's match with the first order condition when matching considerations are ignored differ only in the additional term $\beta F'(k(i))$ in the former (see Figure 1 below).

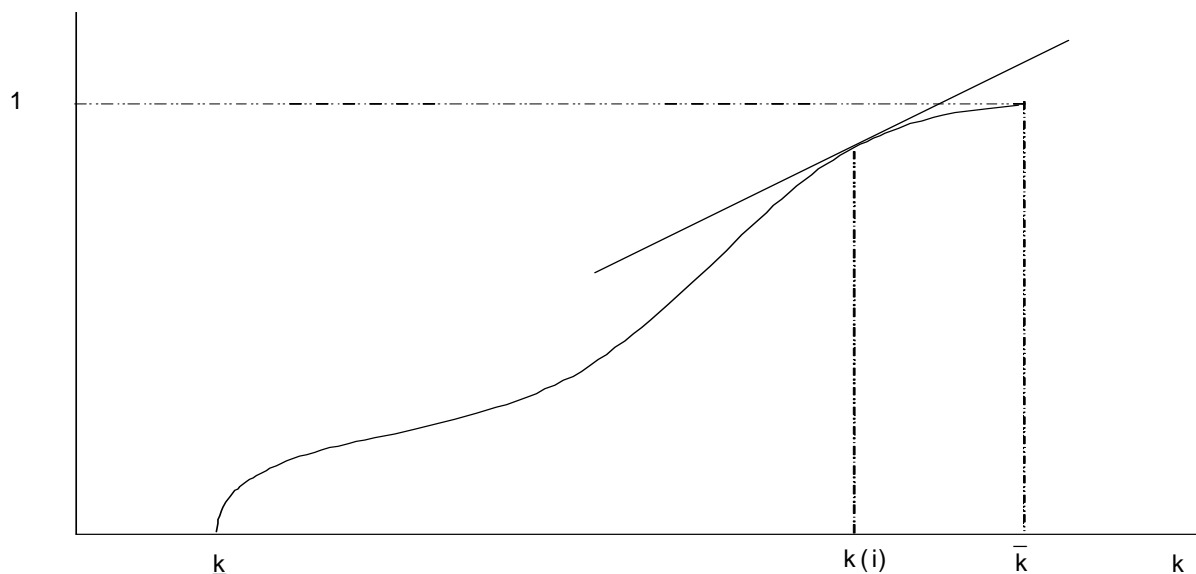


Figure 1: Cumulative distribution function F of bequests

$F'(k(i))$ is a measure of the effect of a small change in family i 's bequest to their son on the son's position in the wealth distribution in his generation. $F(k(i))$ is the son's position when his parents leave $k(i)$; if they left $k(i) + \Delta$, his position would be approximated for small Δ by $F(k(i)) + F'(k(i)) \cdot \Delta$. When the parents in family i are optimally choosing a bequest to their son, the cost of marginally increasing the bequest is their personal marginal utility of consumption. The benefit of marginally increasing the bequest is the discounted marginal utility of their son's consumption *plus* the marginal increase in his relative wealth position that will increase the wealth of the woman he matches with. F' is strictly positive, and consequently in equilibrium, the marginal utility of the father's consumption is higher when matching is affected by bequests than when it is not; this implies that his consumption is lower in that case, i.e., savings are higher.

To summarize, when matching is affected by bequests, people save more. How much more people save when matching considerations are taken into account depends on the dispersion of wealth in the society. When F' is very small, the change in the son's position is small, hence his parents gain little by increasing their bequest to him. If the distribution of bequests is concentrated, $F'(k(i))$ will, on average, be larger than if the distribution of bequests is dispersed. (See Figure 2.)

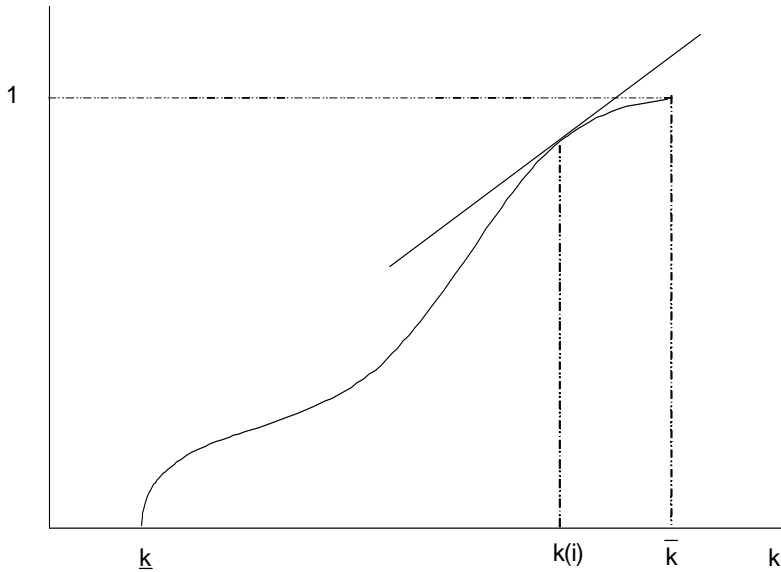


Figure 2: A more concentrated wealth distribution

Consequently, we should expect greater increases in bequests due to concern for rank in societies with more concentrated wealth.²³

3.2.2. Infinite horizon case

This two period example illustrates how individuals in a society with completely standard deep preferences (that is, with no concern for relative rank) may well have reduced form preferences that exhibit such a concern, and furthermore, how that concern leads to savings that are higher than would be the case absent the matching concern.

The “natural” assortative-on-wealth matching will continue to be consistent with individual agent maximizing behavior when the example is extended to an infinite horizon setting. Other matchings, however, may also be consistent with maximizing behavior. CMP92 analyzed an *aristocratic matching*, described as follows. Here, men in the first generation are arbitrarily assigned a rank, with no assumed connection between rank and wealth. The social arrangement prescribes that in each generation, the men with the highest rank match with the wealthiest

²³This depends on the fine details about how concern for relative position is incorporated into the model however. Hopkins and Kornienko (2004) analyze a somewhat different model and show that greater inequality may provide greater incentives to differentiate oneself and lead to an *increase* in spending because of rank concerns.

women; further, people who violate the prescribed behavior will have their male offspring's rank reduced to zero. If all others are following the prescribed behavior, the effect of a deviation from the prescriptions of this social arrangement on the male offspring is that he will match with a less wealthy woman. Hence, a wealthy woman for whom the social arrangements prescribe a highly ranked but less wealthy mate who would be tempted to match instead with a richer man could be deterred by the consumption consequences to her son (about whom it is assumed she cares).²⁴ CMP92 demonstrate that for some economies, there is a Nash equilibrium of the game induced by these social rules that supports the social arrangement.²⁵

Thus, with an infinite horizon, in addition to the assortative-on-wealth matching, there can be a matching in which wealth plays no role. There are important economic differences between two societies characterized by the two matching rules that I've described above. Under aristocratic matching, parents have an incentive to leave a bequest to their male offspring because his consumption enters their utility function, but they have no incentive to increase that bequest to improve his matching prospects. This differs from the case in which matching is assortative on wealth, where there is the same incentive for a pair to leave a bequest to the son because his consumption matters to them, but in addition, there is the incentive to increase the bequest because of the effect on matching.

In summary, there can be two societies that are exactly the same (as far as the number of individuals, their deep preferences and their endowments) that exhibit very different economic behavior because they are governed by different social arrangements that induce different reduced form preferences. In the economy in which ranking is determined by wealth, couples will save more to benefit their sons. In the other, rank is inherited, and hence independent of wealth, reducing the optimal (from a personal point of view) level of savings; the social arrangements here suppress one of the benefits of forgoing consumption.²⁶ Any attempt

²⁴This point is important: the woman follows the prescriptions of the social arrangements because it is strictly in her interest to do so. To repeat what was said above, we are interested only in social arrangements that are completely consistent with optimizing behavior. This approach to modelling social concerns would be distinctly less interesting if we postulated social arrangements that violated this basic aspect of the standard economic paradigm. I will say more about this below.

²⁵See also Cole, Mailath and Postlewaite (1995b, 1997) on aristocratic social norms.

²⁶Note that the higher savings when rank is based on wealth is not welfare enhancing. At the point when the agents in any generation are making their consumption-bequest decisions, all parental couples would benefit if everyone ignored the effect of the bequest on their son's

to understand the differences in economic performance in these two economies must necessarily fail unless the analysis includes the social arrangements governing matching and an investigation of the incentives they provide.²⁷

There are two important features in the equilibria. The first is that even in a simple two-period model nonmarket activities affect reduced form preferences governing savings. The second is that with an infinite horizon, there can be multiple, qualitatively different equilibria in a society stemming from different social arrangements. In the two period example agents' deep preferences exhibited no concern about relative position: parents cared only about their consumption and their son's consumption. However, in their reduced form preferences over consumption-bequest choices, relative position *did* matter since their son's consumption was affected by relative position. I will discuss both of these points in some more detail.

3.3. Concern for relative position

3.3.1. Missing markets

A central feature of the model above when matching is assortative on wealth is that agents care about whom they and their offspring match with, but that there is no (direct) market for matching. Consequently, relative position in the wealth distribution determines how well one fares. While matching is an obvious decision

rank. When the sons' ranks are taken into account, all couples decrease their consumption from the level they would choose if matching considerations were ignored. The decreases are such that the ranking of the sons after the decreases is the same as if no couple had decreased their consumption. Roughly the couples in any generation are engaged in a prisoners' dilemma situation in which every couple in the generation is worse off than had they ignored ranking considerations (as they do in the aristocratic ranking case). Each of these couples, of course, benefited from their ancestor's increased savings.

Welfare evaluations would be altered if we introduced parental concern for daughters' welfare while maintaining our assumption that bequests go only to sons. In this case, an increase in all matched couples' savings would generate a positive externality, as it increases the welfare of all daughters. This would offset, at least partially, the negative externality increased savings imposes on other couples. (I thank Raquel Fernandez for pointing this out.)

²⁷Corneo and Jeanne (1999) analyze a particularly tractable model with similar relative wealth concerns. Hopkins and Kornienko (2006) analyze a growth model in which individuals care about their relative position. There is a substantive difference between Hopkins and Kornienko (2006) (and Hopkins and Kornienko (2004)) and CMP 92. While the focus of all three papers is on the concern for "status", i.e., rank, rank in CMP92 is based on wealth while in the other two papers rank is based on consumption. The competition for position leads to increased consumption when rank is based on consumption rather than increased savings as in CMP92.

that is important but not mediated by a standard market, there are many other decisions that have these properties. Invitations to the White House for dinner, the best seat in the church or synagogue, the table by the window in a restaurant and seats on the board of trustees at elite universities and museums are but a few of the things about which people care, sometimes passionately, but that are not priced in the way an intermediate textbook in microeconomics describes markets. To be sure, it is not that money is unimportant in the determination of how these decisions are made; on the contrary it seems clear that donations affect are called positional goods. Houses in particularly scarce and desirable locations and admission to elite private schools are sometimes called positional goods, that is, goods that will ultimately be consumed by the wealthiest individuals in a society.²⁸ Positional goods resemble the problem described above but there are important distinctions. First, there may be positional goods even with complete Arrow-Debreu markets. With complete markets, the first welfare theorem holds whether or not there are positional goods: the final allocation, including all savings and effort decisions, is Pareto efficient. There is no real externality in economic decisions other than the standard pecuniary externality, which complete markets mediate perfectly. Another way of saying this is that when individuals make decisions, the price vector of marketed goods is the only information an agent needs for decision making. This is not the case for the problems I have discussed; it is precisely the nonmarket good – matching – that people care about and can indirectly influence through their market decisions that make them care about other agents' decisions *in addition* to all prices of market goods. There is no reason to expect that when social arrangements rather than markets mediate the allocation of some goods and services the outcome will be Pareto efficient. Indeed, given that for some economic problems there can be distinct outcomes that can result from different social arrangements, some of these social arrangements will typically be associated with inefficient outcomes.²⁹

Another aspect of the approach described here that distinguishes it from the case in which markets are complete is that complete markets greatly limit the scope of societal differences that can be reconciled with equilibrium behavior.

²⁸See Frank (1985) for a discussion of positional goods.

²⁹Becker, Murphy and Werning analyze a model in which status position can be bought in a market, and show that in their framework, concern for status leads people to make decisions that result in the same distribution of income, status and consumption for very different initial distributions of income. Their setup differs from that considered here in that it is assumed that people have a direct concern for status.

The growth model described above in which there are both equilibria that rank agents by birth and equilibria in which they are ranked by wealth shows that otherwise identical societies can perform differently as a consequence of different social arrangements. Complete markets, of course, allow multiple equilibria, but it's hard to see how that multiplicity can be linked to differences in underlying social structure.

If the driving force of the argument that social arrangements matter is market imperfections, what are the market imperfections that are so important? I used a specific market imperfection – matching – as the basis of the work described above. As mentioned above, there is a myriad of goods and decisions about which people care but that individuals don't purchase through standard markets such as country club memberships and memberships on boards of trustees. These items don't come for free, but they are not obtained through a simple market purchase. A large donation is typically a necessary - but not sufficient - condition to be invited to the White House or to the boards of trustees of charities.

CMP92 used matching for both the motivation and the formal modelling of the market imperfection for conceptual reasons. It would be straightforward to assume that there is some good that is allocated through a tournament (for example by relative wealth) instead of being allocated by markets and carry out most of the analysis in those papers. A compelling case for how social arrangements affect economic behavior, however, should provide some explanation for why the allocation of some goods isn't mediated by price. That is, if particular memberships on boards of trustees (or desirable seats in restaurants or invitations to the White House) are particularly desirable, why can't one dial up, ask the price and give a Visa account number?

From a positive point of view, it's clear that for many of the examples above, this isn't the case. From a conceptual point of view, it seems that part of the reason these things are valued is related to the fact that they are *not* bought and sold in a standard way.³⁰ Nevertheless, if our goal is to understand what seems to be a concern for rank in an entirely standard economic model, any proposed explanation should be based on a clear specification of how any particular behavior affects the goods and services agents consume, uniformly assuming that agents optimize. A proper explanation that relied on the existence of goods or decisions like these should articulate clearly how the system is sustained in the face of optimizing behavior.

³⁰For example, it might be that there is asymmetric information and being invited to serve on a nonprofit board serves a signaling purpose.

The matching decision meets this exacting requirement: There is a clear and plausible link between behavior and consumption and every agent is perfectly optimizing. While I believe that the insights based on this specific market imperfection are widely applicable, it remains an interesting open problem to model carefully how some of the other decisions such as board memberships can be reconciled with fully optimizing behavior in a convincing manner.

3.3.2. Multiplicity

The multiplicity of equilibria in the growth example above stemmed from the fact that in an infinite horizon environment, in any period there can be multiple equilibria in the future continuation problem. In every period, the wealthiest men and the wealthiest women would like to be matched, and if there are no future consequences to consider, matching will be assortative on wealth. The aristocratic equilibrium that resulted in lower savings introduced such future considerations: when the prescription is that the wealthiest woman to match with the highest ranking man even if he is not the wealthiest, this woman understands that deviating from the prescription entails a cost: Her son will not inherit the high rank associated with her prescribed match, and consequently will lose the concomitant desirable match. In the matching in the aristocratic equilibrium, a man's rank enters agents' reduced form utility functions despite the fact that it does not enter directly into their deep utility functions.

The fact that there are multiple equilibria in the infinite horizon dynamic model is not surprising: As in infinitely repeated games, we should expect that the nonuniqueness of continuation play will lead to multiplicity. The insight we get from the multiplicity rests on the plausibility of the behaviors in the different equilibria. That men and women might desire to match with the wealthiest partners possible is eminently reasonable, and any reader of Jane Austen understands the possibility that family background trumps wealth in some social circles. The model above is parsimonious and it is difficult to imagine rankings other than the two I've discussed, but casual observation suggests that education, social skills, athletic ability and physical attractiveness are given different weights in different social circles. Preferences for mates might be hard-wired, but preferences for other attributes are likely of the reduced form type. Endogenously deriving the preferences for mates or friends with these attributes along the lines of the growth model could be useful in understanding how social structure affects economic behavior.³¹

³¹See, e.g., Mailath and Postlewaite (2006) for an example of such a model.

3.4. Market imperfections and conformity³²

The concern for rank that I have thus far focussed on is perhaps the most compelling example of social concerns that affect economic decisions, but a close competitor would be a concern to conform.³³ The question of whether people are predisposed to behave like those with whom they associate is of central importance to policy questions concerning education, drug control, crime prevention and welfare (among others). Arguments similar to those above for treating social concerns as reduced form preferences apply here as well. While there are undoubtedly evolutionary arguments for a hardwired concern to be like others, simply putting such a concern into the utility function has disadvantages similar to those discussed above. As I have stressed, adding arguments to the utility function weakens the predictions that can be made. Similar to the arguments concerning rank, we don't know the particular form that a concern to conform will take; is it that we desire to dress like others, talk like others, or engage in the same activities as others? Why is there general consensus that some Asian societies exhibit more conformist behavior than Western societies? Again, an explanation that relies on genetic differences is less satisfying than an explanation that is based on different consequences for conforming or not conforming in different societies.

Analogous to the derivation of a concern for relative position, there are situations in which market imperfections lead naturally to conformist behavior, namely the existence of public goods or public decisions. There are many consumption activities that are undertaken, at least sometimes, in groups such as dining out, going to concerts and plays, entertaining, sports activities, etc. For group activities, there are common decisions to be taken by the group: how often to eat out and how expensive a restaurant to go to, whether to drive to a nearby ski slope or fly to more exotic but distant resorts, etc. There is often a price-quality "menu" from which the group can choose, from the cheaper but mundane to expensive and exciting. The group's decision typically reflects the preferences of the individuals in the group.

Suppose the group is homogeneous with one exception: the individuals have different disutilities for working. As a consequence of this heterogeneity, there will be a dispersion of labor supplied across the group, and *a fortiori*, a dispersion in wealth. Suppose the group decision is how expensive a restaurant at which

³²The discussion in this section stems from discussions with Peter Norman.

³³See Akerlof (1997) and Bernheim (1994) for examples. As does much of the work on conformism, these papers exogenously assume a desire to conform; in an interesting paper, Morris (2001) derives a reduced form desire to conform.

to dine. If the dinner bill is split evenly, a high income group's choices will be more expensive than a low income group's. A consequence is that an individual with a given endowment will likely spend more on dining out as the group he is a member of becomes wealthier.³⁴

Consider now an individual's labor-leisure choice problem. When we analyze the agent's reduced form problem, we typically employ his (reduced form) utility function over leisure and money, where the utility of money is the utility derived from the goods on which the money is ultimately spent, including dining out. Consider two agents, Andy and Bob. Suppose Andy dislikes work and prefers to work less and spend less on dining out than Bob who enjoys work and is happy to work more and eat better. If Andy and Bob are in the same dining-out group that splits the bill at the end of the meal, they will necessarily spend the same – more than is optimal for Andy but less than is optimal for Bob. When taking the constraints on their dining expenditures that stem from their dining-out group into account, both Andy and Bob will adjust their labor supply choices from what they might choose in the absence of the public decision. Andy will work more because the marginal utility of money is higher because of his higher, socially determined, dining expense and Bob will work less. In the end, we will see a smaller difference in their labor supply choices than had they not interacted socially.

The point of this example is that the individual's choice problem is affected by his or her social group, but only because his reduced form preferences will depend on the deep preferences of other individuals with whom he interacts socially. The structure of the problem, including the social arrangements, generates what appears to be a “conformist” tendency in which people's labor supply choices cluster together. For any given group, the wealthier in the group will work less and the poor will work more than they would in the absence of the joint consumption activity. What appears to be conformism is, however, entirely a consequence of the effect of social arrangements on reduced form preferences. The utility functions are standard in that they are devoid of any psychological or sociological desire to be more like others.

As with the growth example above that exhibited qualitatively different economic outcomes depending on the social norm (whether the ranking used in matching was determined by birth or by wealth), different norms in this example can generate different behavior. Social norms will determine how restaurants are chosen in groups: some groups may use something like majority rule, resulting in

³⁴I take the group or groups of which an individual is a member as exogenous. I discuss below the effect of this assumption.

restaurant expenditures determined by the median wealth individual, some will rotate the restaurant choice among the individuals in the group, making expenditure depend on the variance of the wealth levels, while other groups may allow individuals to veto restaurants they feel too expensive. Different norms will ultimately result in different equilibrium labor supply choices.

We might expect similar “conformist” behavior in other settings where the social environment is important. Consider a group of young married women without children, each of whom is deciding when to take a leave from work and have a child. Any individual woman might worry that if she were to have a baby, she would be isolated from her friends: it would be difficult to find times that she could join them, and when she did join them she might feel excluded from the conversations about work. The situation is reversed after a number of women in the group have children; now it is the childless woman who will find it difficult to join the others during the day, and will be excluded from the conversation that will naturally center on young children. A casual look at the situation suggests a preference among the women to be conformist, that is, to behave as the others in the group behave. This is correct, but again we need to understand that there is nothing in the deep preferences about wanting to conform; the social environment has induced conformist *reduced form* preferences.³⁵

3.4.1. Endogenizing social groups

I will comment on the assumption in the restaurant example that the group to which individuals belonged was exogenous. First, it is obvious that if I modified the example to let individuals choose their social group and if there are sufficiently many people of each ability, people will choose to be in a group with people who

³⁵Neumark and Postlewaite (1998) examine a related question regarding married women’s labor force participation decision. Neumark and Postlewaite carry out an empirical exercise that analyzes a reduced-form model that incorporates into a standard neoclassical framework relative income concerns in women’s (or families’) utility functions. In this model, the entry of some women into paid employment can spur the entry of other women, independently of wage and income effects. The model is tested by asking whether women’s decisions to seek paid employment depend on the employment decisions of other women with whom relative income comparisons might be important. Specifically, that paper looks at the effect of sisters’ employment on women’s own employment, taking into account the possibility that there may be heterogeneity across families in unobserved variables affecting the employment decision. A variety of tests supports the hypothesis that women’s employment decisions are positively affected by a concern about their family income relative to that of their sisters’ families.

are identical to themselves. This is essentially the local public goods result that homogeneous communities are optimal in a simple model like this (cf. Bewley (1981)).

There are several things that mitigate against perfectly homogeneous social groups, however. The whole concept of social groups is somewhat fuzzy. Although the general idea of social groups is compelling, identifying a particular social group and its members precisely is impossible. Abstract social groups as I am using the term presumably include some of an individual's relatives, most of whom are exogenously determined. Also included in one's social group are some or all of one's neighbors. The house one purchases is obviously endogenous; the choice is to a large extent determined by the social group to which one wishes to associate. But since the world is not composed of perfectly homogeneous neighborhoods, some heterogeneity of social groups is unavoidable. Third, even if people initially chose to be in homogeneous social groups, there are substantial transactions costs that prevent easily changing one's social group. Life cycle effects and random shocks will naturally introduce substantial heterogeneity into an initially homogeneous group.

Even with endogenized social groups, we shouldn't necessarily expect the outcome to be perfectly homogeneous groups. The simple model outlined above abstracts from many aspects that are relevant in carefully endogenizing social groups. Folk wisdoms such as "It's better to be a big fish in a small pond" suggest advantages of being above average in one's social group while the socially ambitious individual who doggedly attempts to gain entry into groups well above his or her station is a staple of western literature. There is a tension between the desire to be in a homogeneous group to minimize the conflicts on group decisions and the concern from rank discussed above.

There are two points of this example. The first is to provide another illustration that it is not necessary to deviate from traditional economic modelling methodology with standard deep preferences to understand or explain behavior that seems driven by social considerations. Secondly, by making explicit the relationship between the observed choice (labor supply) and the variables in the deep utility function (dining with friends) we identify a source of heterogeneity of labor supply decisions that we might otherwise overlook.

3.4.2. Multiplicity of social arrangements

There can be a multiplicity of social arrangements with different impacts on economic decisions in this example, as there was in the growth example discussed above. In the restaurant example, I left unspecified the precise manner in which the individuals' preferences over restaurants would be aggregated into a group decision. One possibility is that the system is simply a majority voting system, choosing the median group member's optimum. There is, however, no compelling argument for this particular social arrangement to be canonical. Some groups could be organized by such social arrangements but others could as well be governed by other arrangements. For example, a group could allow any member to "veto" a restaurant as being too expensive. This is equivalent to letting the poorest individual in the group choose the restaurant. These two alternative social arrangements lead to different reduced form utility functions, even if we fixed completely the characteristics of the members of a group. The group governed by a social arrangement in which the restaurant choice is the optimum for the median person will systematically spend more on restaurants than the group for which the restaurant choice is the poorest person's optimal choice. This induces every member of the group to work more; as in the ranking case, any attempt to understand the different economic behavior of two such groups is hopeless unless the social arrangements are part of the analysis.

There is a broader range of social arrangements for this simple example than just how the restaurant is chosen. Once the restaurant choice was made, I assumed that the bill would be split evenly. While plausible, there are clear alternatives. For example, the richer members of the group might pay more than the poorer members.³⁶ As before, different social arrangements generate different incentives for agents' economic decisions.

I emphasize that there is no canonical way in which we could "correct" the market imperfection. There typically will be an infinite number of social arrangements that can govern group decisions. No one of these Pareto dominates the others, and we should expect that different arrangements emerge in different societies generating different incentives in these societies.

³⁶This is perhaps more than a plausible alternative since the outcomes that result from social arrangements prescribing equal division of bills can often be Pareto dominated by outcomes made possible by subsidization of the poor by the rich.

4. Why not take the indirect preferences as the primitive?³⁷

There is a natural temptation to use the above arguments about how a concern for rank can arise instrumentally in a standard economic model with market imperfections as a basis for treating the concern as a primitive, that is in the agents' deep preferences. Once we are convinced that agents have such a concern, why not simply write down the utility function with rank as an argument? We would not be violating the bounds of the parsimonious economic paradigm that I argued were important; we would simply put in a footnote saying "We assume that agents have entirely standard preferences but that there are market imperfections that induce a concern for rank; we begin our analysis with those preferences." I will discuss next first some arguments for doing so, and then some disadvantages.

4.1. The case for making relative ranking an argument of the utility function

Every time a friend succeeds, I die a little.

Gore Vidal

The most compelling argument for including relative position as a direct argument in the utility function is that it seems that people often *do* care directly how they rank in an activity. I will argue below that it is often the case that if we look carefully at a particular situation in which people are concerned with rank, we find that there are consequences of ranking above or below other people, and it may be those consequences that matter rather than the rank *per se*. There are, however, many activities where the most inventive analyst would be hard-pressed to identify economically meaningful consequences of one's rank in an activity that nevertheless motivates substantial investment. It isn't difficult to identify with the elation an online video game player might feel when he beats the displayed historic high score even if he is the only person who will ever be aware of the achievement. Winning simply feels good.

There is a compelling evolutionary argument for an innate concern for relative standing.³⁸ Human beings are the product of millions of years of evolution and our basic preferences have evolved as a mechanism to induce us to behave in ways

³⁷The material in this section draws heavily on Postlewaite (1998).

³⁸See Robson and Samuelson (this volume) for a general treatment of the evolutionary foundations of preferences.

that have fitness value, that is, that increase the probability that we survive and have offspring. We have “hard wired” in us certain preferences that promote survival value; for example, our preference for sweet foods has evolved over a long period during which food was scarce and increased consumption of such foods was accompanied by increases in survival. A desire to ascend to the top of a social hierarchy has plausibly had selection value over the course of human evolution and consequently would be similarly hardwired.

Many animals, including those most similar to humans such as apes and chimpanzees, have a hierarchical social structure with top-ranked members faring better than others. Typically, highly ranked members enjoy better access to food and mating opportunities than those ranked lower. In many species the ranking of males is determined through physical contests, and there are obvious reasons that females should prefer more highly ranked males to lower ranked. First, almost by definition, highly ranked males are likely to be stronger, and consequently, able to afford better protection for the female and for offspring. Second, if the ability to perform well in the contests that determine rank are heritable, male offspring of a highly ranked male are likely to be highly ranked, and as a result, mate and reproduce well.³⁹ It follows immediately that if evolution has favored those females who were sensitive to male rank, evolution would necessarily favor males who tried to maximize their rank.

To the extent that humans are the product of this evolutionary process, we should expect them to exhibit at least a residue of this direct concern for rank. The environment that modern humans inhabit may be drastically different from that which conferred an advantage on the largest and fastest of our ancestors, but the genetic structure that evolved when there was an advantage would remain long after the environmental change. Only if the characteristics that were once valuable become disadvantageous might we expect evolutionary forces to eliminate them, and even then, very slowly.

It would thus be natural for humans to be genetically programmed not only to care about food and sex, but also to care about their relative position in groups in which they find themselves. An argument that such hardwiring serves no useful purpose is no more relevant than to point out that it is dysfunctional

³⁹Note that this argument doesn't depend on the characteristics having any inherent benefit; females who mate with males that have (heritable) traits that other females find desirable will find that their male offspring have plentiful mating opportunities. Peacocks' tails are a prototypical biological example of this. This is similar to the discussion of females' concern for male rank in the aristocratic social norm discussed above.

that an individual's craving for sweets can result in an unhealthy diet; any single individual's preferences are exogenously given, determined by the evolutionary pressures of the past.⁴⁰

4.1.1. Experimental support for direct concern for relative position

Bault, Coricelli and Rustichini (2007) (BCR) devise a very nice experiment that strongly suggests a direct concern for relative rank. The experimental design aims to distinguish an individual's utility from a random outcome in a two-player condition when there is another person with whom his outcome will be compared and his utility from the same lottery in the absence of a second subject, a one-player condition. The presence or absence of a second player has no effect on the alternatives available to an individual nor on the outcome; the only effect of the second player is that the subject can see whether someone else received more or less money. The experiment is as follows:⁴¹

In both conditions the subject has to choose between two lotteries displayed on the screen. The probability of each outcome is described as a sector on a circle. Every point on the circle has equal probability. In the one-player condition, after the subject has made his choice, a square surrounds the lottery he chose. The other lottery is kept on the screen. Then a spinner spins on both circles, and stops randomly at some point on the circle, indicating the outcome. Because this happens on both lotteries, the subject knows the outcome of both lotteries. He is then asked to rate how he feels about the outcome on a fixed scale from -50 to 50. Regret is the event in which the outcome for the chosen lottery is smaller than the outcome on the other lottery, and relief the event in which the opposite happens. The two-player condition is similar except that, after his choice, the subject observes the choice that a subject like him has made out of the same two options available. If the two subjects choose the same lottery and have the same outcome, then they will experience what we can call shared regret or shared relief. If they choose a different lottery, then

⁴⁰See Maccheroni, Marinacci and Rustichini (2010) for a very nice discussion of why we should consider concern for relative position in the deep preferences and axiomatic foundations of such preferences.

⁴¹From Rustichini (2007).

they might experience envy (if their outcome is lower than the outcome of the other) or gloating (if the opposite occurs). In the experiment, subjects were facing choices made by a computer program.

BCR suggest that for negative emotions, envy seems to be stronger than regret and regret stronger than shared regret: Subjects appear to feel worse when they do badly and another does well than when they do badly in isolation. The same is true on good outcomes: people feel better when they've done well and another did badly than when the subjects do well in isolation.

4.2. Drawbacks in including relative position as an argument of the utility function

4.2.1. What precisely is hardwired?

While the evolutionary argument that there is some kind of concern for rank or status hardwired in humans is compelling, it's unlikely that all the determinants of rank are hardwired. As suggested above, sensitivity to characteristics like speed and strength might naturally be the residue of evolutionary forces; it is distinctly less likely that a desire to be the best dressed or to have the most advanced university degrees would be hardwired as a consequence of evolutionary forces. A ranking based on intelligence might be hardwired, but the degree to which one's position in society is enhanced by academic achievement must come from a correlation between academic achievement and intelligence. If the most intelligent individuals in a society choose sports careers, academic achievement won't enhance status as much as in a society in which the most intelligent choose academic careers. In general, while it is probably justifiable to take some kind of a concern for rank as hardwired, we should expect that the degree to which such things as education, wealth or particular occupations to enhance one's status to be culturally determined. Moreover, that relationship is likely to vary across societies, and within a single society, across time.

4.2.2. Parsimony and unity of economic models

I argued above that an advantage of economics modelling is the parsimony of economic models. However, if parsimony were all that mattered one could argue for a parsimonious model that focused on concern for relative position in analyzing a particular problem. There are costs to doing this, even if the resulting model

is descriptively more accurate. It is not simply the parsimony of our models that makes economics successful; the fact that we use roughly the same model to analyze all problems in economics plays a huge role. Consider an economist trying to understand why a new lawyer in town would spend a large sum of money to have his name painted in gold paint on the window of his office when he could print his name on a piece of paper and tape it to the window at no cost. A first year economics student who has passed his qualifying exam would be expected to quickly think in terms of signalling: perhaps the lawyer knows he is good, and can signal this belief to others who might be uncertain by paying a large sum for the gold-painted name. The signal is credible since a low ability lawyer would be unwilling to pay this amount since he realizes he will not be able to recoup the cost before his ability becomes known.

The student can come to this possible explanation because he has seen the Spence signalling model (cf. Spence (1973)) in his first-year microeconomics course. His textbook laid out the relatively crude model of an individual who could be of two types choosing how much education to get, and demonstrated the existence of a separating equilibrium characterized by the high ability student acquiring education and the low ability forgoing education.

In many (all?) other social sciences, the Spence signalling model would draw complaints. Some would object that perhaps the low education person might acquire education for the pleasure, and insist that the model be made more realistic by adding this possibility. Others might worry that students often don't know their own ability and that the model should be modified to account for this. Still others might want to incorporate the fact that education is not a unidimensional object. After the model is modified in response to these concerns, we will have a much more realistic model of education. However, Spence's basic insight about separating equilibria will be obscured to the point that the most sophisticated economists may not recognize the similarity with our lawyer problem. (Indeed, by the time we are done "improving" the Spence model, there may not be any similarity.) The unity of economic analysis that uses a single, simple basic model to analyze a wide variety of problems is hugely valuable. The combination of the same model being used for different problems and the simplicity of the model enables one to transfer insights from the analysis of one problem to other problems.⁴² Spence's job market paper has well over four thousand Google Scholar

⁴²This view of the importance of connecting different parts of a field is not new, as the following quote from G. H. Hardy (1940) makes clear: "The 'seriousness' of a mathematical theorem lies ... in the significance of the mathematical ideas which it connects. We may say, roughly, that a

cites, and the basic insight of the model has been applied to nearly every corner of economic analysis. The range of applications would have been greatly reduced had the model been “corrected” so as to eliminate the glaring discrepancies with the real world.

4.3. Disadvantages of taking the reduced form preferences as primitive

To assess the merits of taking the reduced form preferences as given I first note that it isn’t really clear what should really be the primitive arguments of a utility function. In our basic textbooks we are quite comfortable with analyzing the behavior of an agent whose utility function has hamburgers and french fries as arguments. A neurobiologist might argue that that isn’t the “true” deep utility function because what really makes an individual happy is neurons firing in the brain; the individual only *seems* to enjoy the hamburger and fries because they cause the neurons to fire in a particular way.⁴³ In short, he could argue that the preferences over hamburgers and fries are reduced form and that one should look at the utility function over the chemicals in the brain that generate the satisfaction.⁴⁴

Nevertheless, economists are quite content to use these reduced form preferences both for motivation and for empirical work. This is entirely appropriate if we are trying to predict the behavior of an individual when the price of hamburgers changes or new menu items arise. For these kinds of questions, there is plausibly a stable and exogenous relationship between food bundles and the brain activity they will induce and we lose nothing by replacing the more complicated pattern of neurons by the more familiar hamburger and fries. We might go wrong, however, if we considered questions in which the relationship between the observable goods - the hamburgers and fries - and the brain activity wasn’t fixed and more or less immutable. For example, if we wanted to investigate the effect of feeding someone a hamburger and fries three times a day for a year, we might expect the pattern to change; what was pleasurable at the beginning might

mathematical idea is ‘significant’ if it can be connected, in a natural and illuminating way, with a large complex of other mathematical ideas.”

⁴³This discussion is a variant of Lancaster’s (1966) argument that a consumer’s preferences over goods are derived in the sense that the goods are required only to produce more fundamental characteristics about which the consumer cares.

⁴⁴However, the neurobiologist might find himself being admonished by the physicist who complains that the chemicals are only atoms configured in a particular way, and the deep utility function should be over *them*.

be sickening eventually. There is little lost in beginning an analysis with the reduced form preferences with hamburgers as an argument in predicting demand changes following price increases because the relationship between instrumental and deep preferences varies little over the range of economic circumstances being considered.

In precisely the same way, we could begin with the reduced form preferences including rank concerns for problems in which we believe the relationship between rank and final consumption is fixed and unchanging. But for many problems the interest in an instrumental concern for rank stems from a belief that the form of the relationship between rank and consumption differs across societies. Different societies may well rank individuals by different characteristics or there may be different sets of goods and services that are not allocated through markets, and hence, serve as motivators to enhance rank. Even if the variable determining rank is fixed – say wealth – different distributions of that variable will lead to different reduced form preferences.⁴⁵ Policy choice may be unlikely to change the relationship between a hamburger and the attendant brain activity, but changes in tax law, say, can easily change the wealth distribution, and consequently, the reduced form preferences. In other words, we have to be aware that these reduced form preferences may not even be fixed within the range of alternatives we are considering in a single analysis.

5. Examples employing instrumental concern for rank

The next section provides several examples that illustrate how an instrumental concern for rank can affect standard economic decision problems.⁴⁶

5.1. Conspicuous consumption

Cole, Mailath and Postlewaite (1995a) (hereafter CMP95) applies the ideas in CMP92 to the question of conspicuous consumption.⁴⁷ Economists from Adam

⁴⁵See also Hopkins and Kornienko (2010) for a discussion of this point.

⁴⁶This is not by any means an exhaustive list. Furthermore, I restrict attention here only to theory papers. Examples of empirical work that employ reduced form preferences for rank include Banerjee and Duflo (2008), Botticini (1999) and Corneo and Gruner (2000). There has also been experimental work on the the presence of concerns for rank; see, e.g., Ball, Eckel, Grossman and Zame (2001).

⁴⁷See also Bagwell and Bernheim (1996) and Corneo and Jeanne (1997) for a related models of conspicuous consumption. Zenginobuz (1996) analyzes a model in which agents conspicuously

Smith to Thorstein Veblen (cf. Veblen (1899)) have noted that much of people's consumption is directed to impressing others. It is typically taken as given that people desire to impress others, consciously or unconsciously treating the question of why people want to impress others as outside the domain of economics. The model in CMP95 adds asymmetric information to a nonmarket matching decision similar to that described above. Here, wealth is unobservable but still important to potential mates. Individuals with relatively high wealth have an incentive to signal this fact, people will engage in conspicuous consumption to do so even though they are fully rational with standard preferences. Agents conspicuously consume because it's instrumental: in equilibrium, it results in wealthier mates and, consequently, higher consumption. Poorer individuals could, of course, conspicuously consume in the same manner as wealthier individuals but choose not to because of the (relatively) high opportunity cost of doing so. The inferences to be drawn from consumption patterns are equilibrium inferences.

Again, deriving agents' desire to impress others as instrumental achieves several goals. It again allows an "explanation" of a particular behavior of interest within the standard economic paradigm. Perhaps more importantly, it provides additional structure that has further implications, some of which provide testable hypotheses. For example, if conspicuous consumption serves as a device through which agents can signal their otherwise unobservable wealth, we would expect differing amounts of conspicuous consumption in different environments. In economic situations in which there is very good information about agents' wealth, there is less incentive to conspicuously consume than in situations in which there is poor information about wealth. If one believes that automobiles are a preeminent instrument for signalling wealth and that information about agents' wealth is better in small communities than in large communities, we expect that, *ceteris paribus*, people in large communities would spend more on automobiles than in small communities.⁴⁸ Similarly, we would expect that new arrivals to an area would spend more on such items if there is greater uncertainty about their financial status.⁴⁹

These implications focus on the degree of uncertainty as a motivation for signalling. There are also implications that stem from differences in the rewards to

contribute to a public good due to a concern for relative position.

⁴⁸Similarly, one would expect greater expenditure on other conspicuous consumption items such as expensive watches and clothes.

⁴⁹This is meant to be illustrative; obviously there is a very serious selection bias in both examples.

signalling. In equilibrium, the incentive to conspicuously consume is to demonstrate one's relative wealth, which determines one's share of the nonmarket benefits of relative rank. If there are few nonmarket benefits, there is little reason to conspicuously consume.⁵⁰

5.2. Labor supply

CMP95 analyzes a two-period model in which individuals are concerned with matching. Again, there is a ranking based on wealth, that is, wealthier individuals will match with wealthier mates. In this model, individuals with differing abilities are faced with a labor-leisure choice. Again, the tournament-like competition for mates leads (in equilibrium) to greater effort than would be the case in the absence of the concern for rank. The central point of this model is that an agent responds differently to a lower wage when other agents' wages remain the same than he would if those agents' wages were also lowered.

When all agents' wages are lowered, an individual will face a different wealth distribution than he did previously. If no agent changed his labor supply in the face of a uniform wage decrease, the ranking of agents will be unchanged. If, on the other hand, a single agent's wage was lowered, the wealth distribution of the other agents would be unchanged. A single agent who leaves his labor supply unchanged when his wage alone decreases would see his rank drop, and as a consequence he would be matched with a less wealthy mate.

In general, when increases in wealth or income lead to secondary benefits due to the social arrangements, agents will respond differently to individual-specific and aggregate shocks. For problems in which the difference is significant, the common practice of using microeconomic data to draw inferences about responses to aggregate shocks presents difficulties that are often overlooked since the micro data may include responses to individual shocks that systematically diverge from responses to the same shock when it is applied uniformly to all agents in a society.

These considerations are particularly relevant for problems such as predicting the effects of an income tax. If the secondary benefits that derive from the rank in a society dominate the direct consumption benefit from income, an increase in income tax would have no effect on labor supply since it leaves unchanged the relationship between effort and rank. To the extent that the secondary benefits

⁵⁰Charles, Hurst and Roussanov (2007) documents empirically racial differences in consumption goods, and argues that the differences arise because of different incentives to signal.

are important and ignored, there could be a systematic overestimate of the effect of taxes on labor supply.

There is a second potentially interesting effect of tax policy that is typically ignored. The basic interaction between rank and economic decisions stems from the fact that by altering behavior (saving more, working harder, spending more conspicuously) an individual can increase his or her rank in society. This tournament-like effect typically distorts decisions and the magnitude of the distortion depends on the benefits from distorting. Greater secondary benefits will obviously lead to greater distortions. As mentioned above, there is another less obvious determinant of the incentive to distort, namely the dispersion of wealth in the society. In a society with an extremely disparate distribution of wealth, it might take very large changes in my economic decision (saving, labor supply, etc.) to increase my rank by, say, one percent. But if the wealth distribution is very tight (that is, a relatively equal wealth distribution), the same change in my economic decisions will lead to large increases in rank, and consequently, relatively large secondary benefits. The more equal the wealth distribution, the greater is the marginal secondary benefit from distorting economic decisions. The implication for tax policy is that, *ceteris paribus*, tax policies that lead to more equal distributions of income or wealth provide greater incentives to working and saving when agents are concerned about their rank in these dimensions. There is, of course, no reason to think that inducing agents to work and save more leads to an increase in welfare.

5.3. Investment

“I’ve been saving like crazy. I’m expecting that when I’m 80 and need part-time nursing care, I’m going to be bidding against a lot of people for that.” (Wall Street Journal, 3/4/2003, quoting a money manager).⁵¹

The standard portfolio choice model in finance analyzes an individual’s investment choice in isolation, independent of other investors’ choices. Concern for relative position introduces a tournament aspect to the investment decision. If all other agents invest in Iraqi Development Bonds, my relative wealth position in the future will be much less variable if I do as well. This adds an important general equilibrium component to the investment problem. In the absence of the concern

⁵¹Quote from DeMarzo, Kaniel and Kremer (2004).

for relative position, each agent could make his or her investment decision in isolation since others' decisions have no effect on the agent's ultimate consumption. The addition of nonmarket consumption consequences of relative position make the agent's decision depend on the decisions of others.

Cole, Mailath and Postlewaite (2001) (hereafter CMP01) analyze a model in which individuals allocate their initial endowment between two random investments. The returns are perfectly correlated across individuals for the first investment, while the second asset is idiosyncratic: for each individual, the returns of the second asset are independent of the first asset, and independent of the returns on all other agents' second assets. All investments have the same distribution of returns. As with the papers discussed above, following the realization of the agents' investments, there is an exogenous incremental utility that is increasing in the agent's relative position. As discussed above, the increase might stem from matching that is affected by relative position or from other nonmarket decisions affected by relative position.

CMP01 shows how concern for relative position can affect not only the level of investments that people make, but also the composition of their investments. Of particular interest is whether nonmarket activities provide agents with an incentive to allocate assets in a manner similar to that of other agents or differently from those agents. The issue is whether agents are risk averse or risk loving with respect to their relative position. Suppose each agent invests his entire endowment in the first asset, for which returns are perfectly correlated across individuals. Any agent's initial relative position will then be assured to be unchanged regardless of the performance of the asset since all agents' final wealth holdings will be the same multiple of their initial endowments. Whether any agent has an incentive to deviate from this investment plan depends on how happy he is with his initial relative position. All agents have an incentive to diversify and allocate some of their endowment to their idiosyncratic second asset to reduce risk. However, an agent introduces randomness in his relative position when he unilaterally shifts part of his endowment to his idiosyncratic investment, and the more he invests in the asset the higher will be the variance of his relative position after the random outcomes are realized. How does an agent feel about this increase in variance? This will depend on the rewards that accrue to relative position. Let agents be indexed by $t \in [0, 1]$, $w(t)$ be agent t 's wealth, and $g(x)$ be the value that an agent gets if his rank in the wealth distribution is x (that is, $\Pr\{t|w(t) \leq x\}$). If g is concave, agents will be risk averse with respect to their rank, and will invest less in their idiosyncratic investment than they would have in the absence of a

concern for rank. In essence, the concern for rank leads to herding – a tendency to invest as others do. Notice that this motivation for herding is quite different from that typically investigated in the literature that is driven by informational asymmetries⁵²; herding occurs here despite the absence of private information.

CMP01 demonstrates how this phenomenon might explain home-country bias – the fact that individuals inadequately diversify outside their home country.⁵³ If people’s concerns about relative wealth are restricted to comparisons to those in their own country, they will want their investments correlated with those of their compatriots if g is concave. If some agents are constrained to bias their portfolio (for example, rules that restrict institutions to invest only in home-country companies), this will induce all other agents to also bias their portfolios as well.

The concern for relative position will not necessarily lead to conformist investing, however. It was the concavity of g that lead an agent to desire a portfolio that was correlated to others’ portfolios. If g is convex, the opposite is the case: agents will be risk-loving with respect to relative position.⁵⁴ A society in which a few at the top of the ranking receive great benefits while the masses receive little or nothing gives an incentive for risk-taking for an agent not at the top to begin with. He may lose his money, but the decrease in status that accompanies the monetary loss is of little consequence.

Thus, the shape of g within a society – how the nonmarket benefits are spread among the populace – can have an important effect on risk taking. Societies in which those at the bottom do poorly, while the majority are treated about the same will see less risk taking than those in which the benefits are concentrated at the top.

Subsequent work on the effect of a concern for relative position on financial markets includes DeMarzo, Kaniel and Kremer (2004) who analyze a general equilibrium model with a participation constraint. Suppose individuals in a community want to consume a “local good” in the future, but suppliers of this good cannot fully hedge their endowments (e.g., future labor services are not fully collateralizable).⁵⁵ Because agents realize that they will compete with others in their

⁵²See, e.g., Bikhchandani, Hirshleifer and Welch (1992).

⁵³See Lewis (1999).

⁵⁴See Gregory (1980), Robson (1992) and Roussanov(2008) for discussions of convexity vs. concavity.

⁵⁵Communities may also be generational, as in the quote at the start of the section, with the assumption that the tomorrow’s nursing care providers are unable to fully hedge their future wage risk today.

community when it comes time to consume the good, they will care about their relative wealth. In equilibrium, agents in their model then have an incentive to herd and choose portfolios similar to those of other agents in the community.

The authors continue this line of work in DeMarzo, Kaniel and Kremer (2008), and show how concern for relative position can also lead to financial bubbles. Here, communities correspond to generational cohorts. Young agents fear that if others in their cohort become rich, their saving activity will drive down future investment returns. In equilibrium this effect leads agents to buy broadly held assets they know are over-priced in order to preserve their relative position; by not following the crowd an agent would run the risk of being left behind if the investments perform well.

Robson (1992) shows how an individual might have a direct utility function over wealth itself that is concave, yet have utility that is convex in some wealth regions when the indirect effects of relative wealth are taken into account. Becker, Murphy, and Werning (2005) provide an alternative to relative wealth concern models by assuming a direct concern for status which can be acquired through purchases of a “status good”. They assume that status increases an agent’s marginal utility of consumption, and show that in their model this leads to risk taking, but argue that the resulting outcome is optimal.⁵⁶ Roussanov (2008) incorporates a concern for relative wealth into a simple model of portfolio choice and shows that this helps explain a range of qualitative and quantitative stylized facts about the heterogeneity in asset holdings among U.S. households. In his model, investors hold concentrated portfolios, suggesting, in particular, a possible explanation for the apparently small premium for undiversified entrepreneurial risk. Consistent with empirical evidence, the wealthier households own a disproportionate share of risky assets, particularly private equity, and experience more volatile consumption growth.

6. Concluding remarks

The multiplicity of equilibria for a fully specified economy, where the multiplicity stems from different social norms, is a valuable tool in understanding differences in economic behavior and performance across economies. In a sense, however, this approach simply pushes the indeterminacy one level deeper in that it replaces the explanation “people in different economies have different preferences” with the

⁵⁶See, however, Ray, Robson and Xia (2008) regarding the efficiency of the outcome.

explanation that they are governed by different social arrangements that induce different reduced form preferences.

There is, however, additional structure that comes from the instrumental approach. The model above from CMP92 derived an instrumental concern for relative wealth and showed that the reduced form utility function incorporating that concern depends on the distribution of wealth. Policies that lead to changes in the distribution will result in changes in reduced form preferences. The process of explicitly modelling the social arrangements provides structure that leads to new insights and testable hypotheses; simply adding relative wealth as an argument in the utility function would not do this.

Nevertheless, I am sympathetic to a view that the work described above leaves unanswered the basic question of why different economies perform differently. For this we need an understanding of why different societies are governed by different social arrangements. The modelling approach described here has the potential to do this. I described above how decisions that are not mediated through normal markets could induce a concern for rank, and further, how there could be both equilibria in which people are ranked by birth and by wealth. The additional structure that comes from the specification of the instrumental value of rank has the potential to provide insight into the circumstances when one or another rank would more likely arise.

Consider a variant of the models described above in which some nonmarket decisions induce a concern for rank, but in which people have the opportunity to invest either in physical capital that could be bequeathed to one's children in the standard way or in human capital which could be passed on to one's children through training and teaching. Such a model might well have equilibria in which the ranking that determines the nonmarket decisions is based on either of the two variables.

Suppose there is a small probability that everything an agent owns is confiscated. To the extent that human capital is (at least relatively) freer from the risk of confiscation, it might be more likely to arise as the determinant of ranking than physical capital in the face of confiscation risks. This is not simply because human capital accumulation is necessarily a more efficient way to help one's children in this environment (which it may or may not be depending on the parameters of the problem). Rather, it may be that ranking by human capital is more stable than ranking by physical capital, even if physical capital were more efficient than human capital to offset its greater vulnerability to confiscation. In other words, it may be that social norms based on physical capital simply have lower survivability

rates than do social norms based on human capital; if so, we would expect to see human capital rankings in these environments.

The basic point is that some social arrangements are more stable than others. The fundamentals of one economy may allow a particular social arrangement to survive while the social arrangement might not be sustainable in another.⁵⁷ Once again, the additional structure provided by a complete specification of the underlying foundations of the social norms provide implications beyond those that are possible when those arrangements are taken to be outside the scope of analysis.

⁵⁷CMP92 and Brooks (2001) discuss this possibility in detail.

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