Choosing the Right Pond: Social Approval and Occupational Choice
Authors(s): Anandi Mani and Charles H. Mullin
Source: *Journal of Labor Economics*, Vol. 22, No. 4 (October 2004), pp. 835-861
Published by: The University of Chicago Press on behalf of the Society of Labor Economists and the NORC at the University of Chicago
Stable URL: http://www.jstor.org/stable/10.1086/423156

Choosing the Right Pond: Social Approval and Occupational Choice

Anandi Mani, *Williams College*

Charles H. Mullin, *Bates White*

We model the endogenous emergence of social perceptions about occupations and their impact on occupational choice. In particular, an individual's social approval increases with his community's perception of his skill in his chosen career. These perceptions vary across communities because individuals better assess the skill of those in occupations similar to their own. Such imperfect assessment can distort choices away from comparative advantage. When skill distributions differ across occupations and/or correlate positively, the community perceives one occupation more favorably. This favored sector experiences overcrowding, but misallocation occurs across both sectors. Furthermore, a positive skill correlation can produce multiple steady states.

> Like children on the merry-go-round who look up to see if anyone is watching, youth who are attaining an education look around to see if their work is being appreciated by the adult and teenage worlds around them. The absence of a favorable response takes away the fun. (Akerlof 1997)

The first part of our title is inspired by an interesting book by Robert Frank (1985) that deals with the issue of how social status concerns affect decision making in different walks of life. We thank Abhijit Banerjee, Arthur Goldberger, participants at the Institute for Research on Poverty summer workshops, and two referees for useful comments. Contact the corresponding author, Charles Mullin, at charlie.mullin@bateswhite.com.

[*Journal of Labor Economics*, 2004, vol. 22, no. 4]

0734-306X/2004/2204-0004$10.00

I. Introduction

Educational attainment and occupational choice have been analyzed from various perspectives in the economics literature. The most basic approach applies a comparison of pecuniary costs and benefits, as in other aspects of economic decision making.[1] The development economics literature examines the impact of market imperfections, especially the lack of easy access to credit, and the effects of wealth inequality on educational investment and occupational choice.[2] However, more than purely economic considerations affect career choices. Desire for approval and support from those in our social group influences these decisions.

This article analyzes the impact of this need on educational and occupational choices.[3] We pay attention to the fact that attitudes toward education and perceptions of the desirability of various career choices are far from uniform. Individual families and communities often have strong and different opinions about the types of careers their children should pursue, independent of pecuniary considerations. For instance, Glazer and Moynihan (1970), in their classic work *Beyond the Melting Pot*, contrast the central role of education in the life of children in Jewish homes with education's peripheral standing in families of southern Italian descent in New York City.[4] Therefore, in studying social approval and occupational choice, we consider not just the question of how the community's perceptions affect individual choices but also the interesting issue of how such community perceptions emerge.

We use a two-sector, overlapping-generations framework, where the sectors represent occupations or types of occupations (e.g., white-collar vs. blue-collar jobs, or those with an "intellectual/creative" bent vs. those without). The model has three key assumptions. First, agents differ in their skill endowments across the two sectors, and they must choose one of these sectors as a career. Second, individuals care about the social approval of their community, which consists of individuals with whom

[1] We refer here to the classic work by Roy (1951) and the literature that followed in its wake.

[2] This literature includes Banerjee and Newman (1993) and Galor and Zeira (1993).

[3] The relation to the large literature on social status concerns and economic outcomes is discussed later in this introduction.

[4] According to Glazer and Moynihan (1970): "The emphasis on getting a college education touches every Jewish schoolchild. The pressure is so great that what to do about those who are not able to manage college intellectually has become a serious social and emotional problem for them and their families" (p. 156). In contrast, whereas "it was the 'bad' son who wanted to go to school instead of to work, the 'bad' daughter who wanted to remain in school instead of helping her mother. . . . For the children of the South Italian peasants in New York to get a college education . . . was a heroic struggle" (p. 199).

they interact on a regular basis.[5] Social approval depends upon the average perception of a young individual's ability in his chosen career. Third, individuals' own career choices affect their assessment and perceptions of others.[6] Specifically, individuals assess more accurately the ability of agents who choose careers similar to their own than the ability of agents who choose other occupations.[7]

The third assumption is the key element of the model. When aggregated to the community level, it implies that the accuracy of the community's assessment of individual ability in a given career increases in the fraction of its population that made a similar career choice. This differential recognition of ability across sectors generates a distribution of perceptions about various careers across communities and potentially distorts agents' choices away from what comparative advantage would dictate.

To understand the basic mechanism at work, consider the most transparent case. Suppose that agents' abilities across the two sectors, call them X and Y, follow identical normal distributions that correlate positively and perfectly. Also, assume that the majority of the older generation worked in sector X. In this case, when forming perceptions about an individual's ability, the community gives more weight to her actual ability if she opts to work in sector X than when she opts for sector Y. As a result, sector X attracts all agents with above-average ability in X, since their worth will gain greater recognition in that sector. Conversely, agents with below-average ability in X would like to hide in the relative anonymity of sector Y. However, the exodus of skilled agents to sector X creates a negative selection bias for sector Y (the average ability of sector Y workers would be lower than the population average). Under the assumption of perfect correlation in ability, the highest-ability agents in

[5] The empirical literature supports a local definition of community. Borjas (1995) finds evidence of social group effects at the neighborhood level (as defined by the 1970 U.S. Census and containing approximately 4,000 persons) but no evidence of such effects at the county level. Similarly, Bertrand, Luttmer, and Mullainathan (2000) find empirical evidence in support of network effects in welfare participation, which are stronger at more disaggregate levels. Further, since we are concerned with agents at the threshold of making educational/occupational choices, we assume that the community is determined exogenously.

[6] Work by sociologists Kohn and Schooler (1969) and others shows that education and occupation govern one's attitudes toward a wide variety of issues, including desirable occupational attributes.

[7] Bisin and Verdier (1998) make a similar assumption, stating that parents want to socialize their children to their own preferences because children with preferences different from their parents' would choose actions that maximize their own and not their parents' preferences. We do not assume that parents have a bias toward children following in their footsteps. Instead, we assume that they can better appreciate both success and failures when a child chooses a path more similar to the one they themselves chose.

sector Y always prefer to switch to sector X. This latter effect leads to a complete unraveling of sector Y, with all agents choosing sector X.

At the opposite extreme, suppose that agents' abilities across the sectors correlate negatively and perfectly. Again, all agents with above-average abilities in X would choose this sector. However, in contrast to the previous case, the exodus of agents to sector X creates a positive selection effect for sector Y. The positive selection effect reinforces the desire of those with above-average skills in sector Y to remain in sector Y. In equilibrium, both sectors are of equal size and all agents' choices are in accordance with comparative advantage.

Now consider the case of imperfect correlation in ability across the two sectors. Most agents who are highly skilled for sector X will choose this sector. As long as the correlation in skills is nonpositive, all agents allocated according to comparative advantage is the steady state, even though agents care about social approval. However, when ability across sectors correlates positively, all stable equilibria distort the community's occupational allocations away from what would be dictated by comparative advantage. Specifically, the initially larger sector remains larger in equilibrium and enjoys a positive selection effect. We refer to this sector as the preferred sector since, on average, it commands higher social approval. This preferred sector draws too many agents relative to the comparative-advantage-based allocation. At the same time, some agents with a comparative advantage in the larger (preferred) sector choose the smaller one, so as to obscure their low-ability level in the former. Notice here that the perceptions regarding a particular career choice, favorable or otherwise, emerge endogenously. Further, which sector attains preferred status within a particular community depends on history.

The mechanism described above can neatly explain, for instance, the oft-perceived "superiority" within academic circles of choosing an academic job over a (higher-paying) job in private consulting or elsewhere (a perception not necessarily shared by those outside these circles). It would also explain why people from more elite backgrounds would likely choose a white-collar job of, say, an elementary school teacher (or a classics professor) over an equally well-paying, or even higher-paying, blue-collar job.

Having examined the case of identical skill distributions, we turn to the case where ability distributions across the two sectors differ. Here, the sector that would command greater social approval if choices were dictated purely by comparative advantage usually becomes the preferred sector. However, regardless of the correlation in skills, all equilibria deviate from the one dictated by comparative advantage. Further, the extent of misallocation increases with the correlation in skills.

In particular, when the correlation in skills is sufficiently high, all agents opting for the low-variance sector becomes a stable steady state. This extreme outcome can emerge even if the mean skill level in the other sector is higher. For instance, this result implies that social perceptions within a community can emerge endogenously and drive all its members to opt for low-education choices, such as teenage motherhood or petty crime, over options with higher mean skill levels and better wage prospects. This latter equilibrium corroborates Wilson's (1987) hypothesis that the out-migration of middle-income families to the suburbs triggered the deterioration of education and career outcomes of inner-city residents. In the framework of our model, the exodus of middle-income families is exactly the type of shock necessary to send a community into a low-education trap; like the children on the merry-go-round to whom Akerlof refers, the absence of adult appreciation "takes the fun away" from success in school. In trying to extricate communities out of such a trap, our analysis explains why individualized financial incentives in the form of, say, merit scholarships for students, or even their parents, may not work as effectively as initiatives that have an impact at the community-wide level. The latter could include measures to alter the composition of communities, such as moving people from housing projects to mixed neighborhoods or community-level initiatives to popularize education.

This article contributes to two literatures. In the context of the labor literature on occupational choice, it highlights the role of a simple but important factor: the desire for social approval. In the context of the literature on social status, it suggests an intuitively plausible informational mechanism through which different perceptions about occupational status emerge.[8] In doing so, it provides a much richer microeconomic structure than much of this literature does. For example, Akerlof (1997), in explaining how identity differences across groups can affect career and life choices, simply embeds a desire to conform (or an aversion for "social distance") directly into the utility function. In this article, an individual does not care about being similar to others per se; in fact, he would like to be as outstanding as possible. It is the limited ability of his community to assess choices dissimilar to their own that induces him to conform. This feature also implies that, when more agents in a community choose a particular occupation, more high-skilled agents will want to choose that occupation—as in peer effects models with human capital spillovers. However, unlike in standard peer effects models, the expansion of this sector enhances overall ability to assess talent in that sector, which causes low-skilled agents to shy away from it.

Within the status literature, this article closely relates to the literature on social status concerns and educational patterns, such as Fershtman and Weiss (1993) and Fershtman, Murphy, and Weiss (1996). These models

[8] See, e.g., Jones (1984), Bernheim (1994), Akerlof (1997), Bisin and Verdier (1998), and Piketty (1998).

focus on the impact of income and wealth distribution on educational investment, labor-market outcomes, and growth. While these papers model the demand for status to be income elastic, we view the desire for social approval as being universal (it is not a concern of those at higher income levels alone).

The article proceeds as follows. Section II presents the model, and Section III discusses the single-period equilibrium. Section IV describes the steady states of the model, first for the case of identical skill distributions and then for varying skill distributions. Section V discusses various implications of the analysis and concludes. The appendix contains proofs for all propositions and lemmas.

II. The Model

We consider a two-period, overlapping-generations model with two sectors, X and Y. At birth, individuals receive an endowment $\{x_i, y_i\}$ of skills in the two sectors.[9] During the first period, they choose in which sector to work. Their endowment, the relative wages in the two sectors, and the status they can attain in either sector all affect this decision. In the second period, individuals confer status on the younger generation. The status conferred equals their best inference of the young worker's ability in his or her chosen sector.

A key feature of the model is that ability is not publicly known and individuals differ in their capacity to assess it. Specifically, we assume that agents perfectly determine the skill level of workers in the sector to which they belonged but that they only determine the average skill level of those in the other sector. The community-wide status conferred on a young agent is a simple average of the status conferred on him or her by individual agents. Let θ_t be the fraction of the old generation that was in sector X in period t and $\bar{x}_{t+1}$ and $\bar{y}_{t+1}$ be the realized average skill levels in those sectors for the younger generation. Then, the status of the ith member of the younger generation is

$$\theta_t x_{i,\,t+1} + (1 - \theta_t)\bar{x}_{t+1}$$

if she chooses sector X and

$$\theta_t \bar{y}_{t+1} + (1 - \theta_t) y_{i,\,t+1}$$

if she chooses sector Y. To simplify notation, from this point forward, we use time subscripts only when they differ from $t + 1$.

Individual utility is a separable function of wages, w, and social approval, A: $U(A, w) = \alpha A + (1 - \alpha)w$, $\alpha \in (0, 1)$. We assume that occupational choices of agents in the community do not affect wages. This

[9] Although we abstract from investment in human capital, the endowment can be viewed as an individual's potential in each sector.

assumption is consistent with the fact that wages typically are determined at an economy-wide or regional level, whereas we define communities at the local level. Finally, an individual's wage in either sector increases with his or her ability in that sector, and for the purposes of our analysis, it is exogenous.

For the analysis that follows, we will treat $\alpha = 1$ and abstract from wages. This simplification focuses this article on social approval. Including wages would reduce the influence of social approval on individuals' career decisions. However, it would not reverse the effect. Indeed, the fact that some people consciously choose lower-paying occupations over higher-paying ones illustrates that factors beyond monetary compensation affect individual utility. Later, we briefly discuss the effects of retaining wages. Ignoring wages, an individual with an endowment $\{x, y\}$ maximizes the social approval she receives:

$$\max\{\theta_t x + (1 - \theta_t)\bar{x}, \theta\bar{y} + (1 - \theta_t)y\}.$$

Therefore, he or she is indifferent between the two sectors if

$$y = \bar{x} + [\theta_t/(1 - \theta_t)](x - \bar{y}) \equiv y_0 + mx, \tag{1}$$

where $m \equiv [\theta_t/(1 - \theta_t)]$ and $y_0 \equiv \bar{x} - m\bar{y}$. We refer to (1) as the "indifference line."

The indifference line summarizes two potentially competing forces. First, agents would like to be outstanding in the sector they choose, creating an incentive to choose the occupation in which they have a comparative advantage in skill. Second, talented agents want others to recognize their skill. Therefore, the sector that was initially larger attracts those individuals with high talent in both occupations, irrespective of where their comparative advantage lies. Similarly, those agents with lesser talent in both occupations prefer to hide in the smaller sector.

Referring to figure 1, all agents with an endowment y greater (less) than the right-hand side of (1) strictly prefer sector Y (sector X). From the indifference line, the double integrals below give the current period fraction in sector X and the average skill level of those choosing each sector:

$$\theta = \int_{-\infty}^{\infty}\left\{\int_{-\infty}^{y_0+mx} f(x,y)dy\right\}dx, \tag{2}$$

$$\bar{x} = \int_{-\infty}^{\infty} x \cdot \left\{\int_{-\infty}^{y_0+mx} f(x,y)dy\right\}dx/\theta, \tag{3}$$

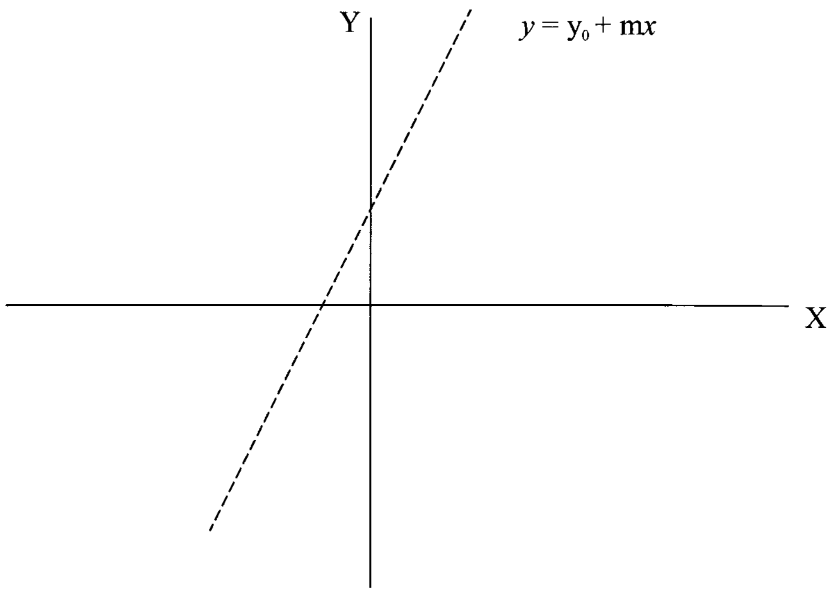

Fig. 1.—Indifference line dividing sector X and sector Y. Agents to the left choose sector Y, while those to the right choose sector X.

and

$$\bar{y} = \int_{-\infty}^{\infty}\left\{\int_{y_0+mx}^{\infty} y \cdot f(x,y)dy\right\}dx/(1-\theta), \qquad (4)$$

where $f(x,y)$ represents the joint distribution of skills in the two sectors.[10] After substituting out for θ, this is a system of two equations and two unknowns.

III. Single-Period Equilibrium

In each period, the fraction of the older generation that worked in sector X is given. This fact fixes the slope of the indifference line at $m = \theta_t/(1-\theta_t)$. Without loss of generality, we assume that at least half of the previous generation was in sector X, which implies that the slope m is at least one.[11] As depicted in figure 1, everyone above and to the left of the indifference line prefers sector Y, while everyone below and to the right of the line prefers sector X.

[10] When all agents are in one sector, the mean in the other sector is not well defined. To maintain continuity, we define the sector means at each boundary as the limiting value.

[11] If this is not true, we can relabel sectors X and Y such that this holds.

Shifting the indifference line to the left or right simultaneously changes the current-period fraction in sector X, the y-intercept, and the sector means, $\{\theta, y_0, \bar{x}, \bar{y}\}$. In principle, the single-period equilibrium can be analyzed in terms of any of the four variables.[12] For clarity in exposition, we carry out our analysis in terms of the intercept y_0 and deduce the corresponding value of θ. However, without any restrictions on the joint density of skills, this system can have an arbitrary number of solutions. Therefore, to keep the problem tractable, we restrict our analysis to the case of the bivariate normal distribution,

$$\begin{pmatrix} x \\ y \end{pmatrix} \sim N\left(\begin{bmatrix} \mu_x \\ \mu_y \end{bmatrix}, \begin{bmatrix} \sigma_x^2 & \sigma_{xy} \\ \sigma_{xy} & \sigma_y^2 \end{bmatrix}\right).$$

Let $\rho = \sigma_{xy}/(\sigma_x\sigma_y)$ be the correlation in skill across sectors. This assumption places the model on similar ground to the Roy (1951) model and allows us to draw on many of the results concerning the Roy model in Heckman and Honoré (1990). Furthermore, we believe that the results obtained generalize to any "well-behaved" unimodal distribution.[13]

A. Sector Means

An agent's own skill and the (conditional) mean skill level in his or her chosen sector combine to determine his or her status. As a first step toward characterizing the single-period equilibrium, we determine how the mean skill level in each sector varies with y_0. Lemma 1 accomplishes this task.

LEMMA 1. As a function of y_0 (the y-intercept of the indifference line), the two conditional sector means are

$$\bar{x} = \mu_x - \rho_x\sigma_x\lambda(-y_0^*) \text{ and } \bar{y} = \mu_y + \rho_y\sigma_y\lambda(y_0^*),$$

where $\rho_x = \text{corr}(x, y - mx)$, $\rho_y = \text{corr}(y, y - mx)$, $y_0^* = [y_0 - (\mu_y - m\mu_x)]/\sigma^*$, $\sigma^* = \sqrt{\text{var}(y - mx)}$ and $\lambda(y_0^*)$ is the inverse Mills ratio ($\lambda(y_0^*) \equiv \phi(y_0^*)/[1 - \Phi(y_0^*)]$).

Based on lemma 1, when skills have a nonpositive correlation across the two sectors, ρ_y is positive and ρ_x is negative. Since $\lambda(\cdot)$ is positive for all finite y_0, nonpositive correlation in skills implies that the mean skill level employed in each sector exceeds the population mean skill level for that sector. Furthermore, since $\lambda(\cdot)$ is an increasing function, the mean skill level in a sector increases as the fraction of the population in that

[12] The only exception is when a sector mean is invariant to shifts in the indifference line. In this case, that sector mean may not be used.

[13] Under a bivariate normal distribution, an individual's status in one sector is a linear function of her status in the other sector, with a homoscedastic error term. By "well-behaved," we mean that this relationship remains approximately linear with a nearly homoscedastic error term.

sector decreases, regardless of the slope of the indifference line. Finally, whenever these results hold, we say the sector benefits from positive selectivity bias.

When skills correlate positively, either ρ_y or ρ_x may change sign (but not both).[14] When a sign change occurs, then the conditional mean in that sector falls below the population mean, resulting in negative selectivity bias. Whether or not a sign change occurs is a function of both the strength of the correlation in skills and the slope of the indifference line.[15] The nature of the selectivity bias in the two sectors determines the number of stable single-period equilibria. When both sectors enjoy positive selectivity bias, a unique solution exists. To see why, start with all agents in sector Y. As agents move from X to Y, $\bar{y}$ increases and $\bar{x}$ decreases. These shifts in the sector means reduce the incentive of each remaining agent to choose sector X over sector Y. Eventually, none of the agents remaining in Y desire to move. Alternatively, when one sector suffers negative selection bias, multiple equilibria may exist. For concreteness, suppose that sector X experiences negative selectivity bias. Again, start with all of the agents in sector Y. As agents move from X to Y, both $\bar{y}$ and $\bar{x}$ rise. Moreover, the fraction of the population in sector X affects the relative change in these sector means. Thus, movements from X to Y may either increase or decrease the incentive of each agent to switch from X to Y. When the former occurs, multiple equilibria can exist.

B. Solution to the Single-Period Problem

To locate the fixed point(s) of the single-period problem, observe that any fixed point y_0 satisfies the following condition:

$$y_0 = \bar{x}(y_0) - m\bar{y}(y_0). \tag{5}$$

Consider any given value of y_0 on the left-hand side of (5). The right-hand side uses this y_0 to first compute $\bar{x}$ and $\bar{y}$ (using lemma 1) and then indirectly computes y_0, using its definition, $y_0 = \bar{x} - m\bar{y}$. If the initial value of y_0 coincides with the computed value of y_0, it is a fixed point. The value of θ that it yields, using (2), would be an equilibrium value. Proposition 1 characterizes the equilibrium values of θ corresponding to the fixed points that satisfy (5).

Proposition 1. Given θ_t, the fraction of the previous generation employed in sector X, there exists a unique stable interior solution for θ_{t+1} if the correlation in skills across the two sectors is negative, zero, or

[14] The proof of proposition 1 shows that both sectors cannot simultaneously suffer from negative selection bias.

[15] In particular, ρ_y changes sign when the slope of the indifference line exceeds the slope of the $E[y|x]$. Similarly, ρ_x changes sign when the inverse of the slope of the indifference lines exceeds the slope of the $E[x|y]$.

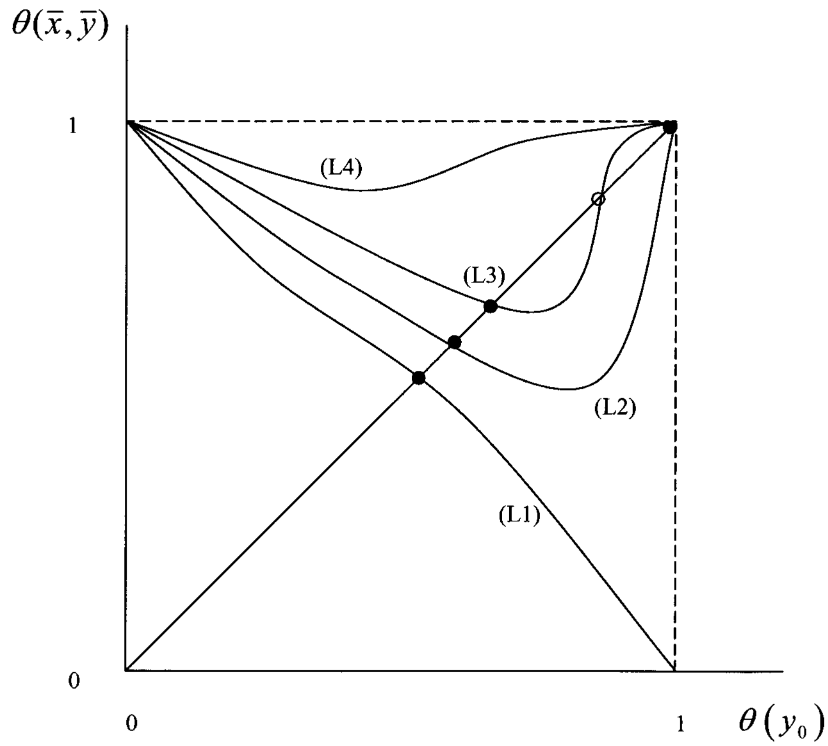

FIG. 2.—Single-period equilibrium. The fraction of the population desiring sector X as a function of the fraction actually choosing sector X. Solid (open) circles indicate stable (unstable) steady states.

weakly positive. If the degree of positive correlation in skills is sufficiently large, there exists a unique stable interior solution for θ_{t+1} and/or a boundary solution, with all agents in one sector.

Figure 2 graphs the fraction of the population that desires to be in sector X as a function of the fraction actually choosing sector X. An intersection between one of these transition paths and the 45° line denotes a single-period equilibrium. The equilibrium is stable when the transition path crosses the 45° line from above. In figure 2, L1 covers the negative, zero, or low-positive skill correlation cases.[16] In these cases, both sectors benefit from positive selection bias. Thus, increasing the size of one sector lowers its mean relative to the other sector, which decreases the incentive for additional agents to switch. This movement of the means ensures that the single-period transition path has a negative slope throughout. In other words, a unique and stable interior solution for θ exists.

[16] A low positive correlation is $\rho \leq \min\{\sigma_y/(m\sigma_x), m\sigma_x/\sigma_y\}$.

When the correlation in skills is highly positive, one sector suffers from negative selection bias. In this illustration, it is sector Y. Now, increasing the size of sector X lowers the mean in both sectors. To demonstrate the dynamics, start with nobody in sector X. Initially, as agents move into X, $\bar{x}$ falls rapidly, while $\bar{y}$ decreases slowly (the more severe the selection, the faster the mean changes).[17] So, the incentive to enter X falls and the transition path slopes down. As more agents enter X, the rate of change in $\bar{x}$ decreases, while the rate of change in $\bar{y}$ increases. Eventually, $\bar{y}$ moves fast enough relative to $\bar{x}$ that, as more agents leave Y, the incentive for others to leave Y increases. At this point, the transition path becomes upward sloping. For moderate levels of correlation, although the transition path becomes upward sloping, the increased incentive to enter sector X created by the diverging sector means is insufficient to overcome the growing gap in comparative advantage for those remaining in sector Y (L2). As the correlation in skills increases, the transition path turns upward sooner. Eventually, the means diverge faster than the gap in comparative advantage for those remaining in sector Y, producing a corner solution with everyone in X (L2 and L3).[18] For a sufficiently high positive correlation, the transition path turns upward before it crosses the 45° line. In this case, the corner solution is the only equilibrium (L4).

IV. Steady States

The economy described above is in a steady state when the current fraction of agents in sector X and the average skill level in each sector are the same as in the previous period. We examine the set of steady states for this economy in two parts: first, the case of identical skill distributions across the two sectors and then the case of different skill distributions. In most cases, we present analytic results. However, the lack of a closed-form solution for the cumulative normal density function prevents us from attaining a general closed-form solution for interior steady states.[19] Hence, we provide numerical simulations for these cases. This numerical approach is very reliable. A single variable, the fraction of the population in sector X, which is bounded between zero and one, characterizes the

[17] In the equations for the sector means given in lemma 1, the second derivative of λ is positive.

[18] The unbounded support of the normal distribution gives rise to the stable boundary solution. For bounded distributions, this boundary equilibrium may move to the interior or not exist at all. We provide a more thorough discussion of bounded distributions later in this article.

[19] An increase in the value of θ in the steady state has two effects—a leftward shift in the indifference line and an increase in its slope. These two effects generate potentially conflicting movements in the sector means. The lack of a closed-form solution for the normal CDF makes it difficult to determine which effect dominates.

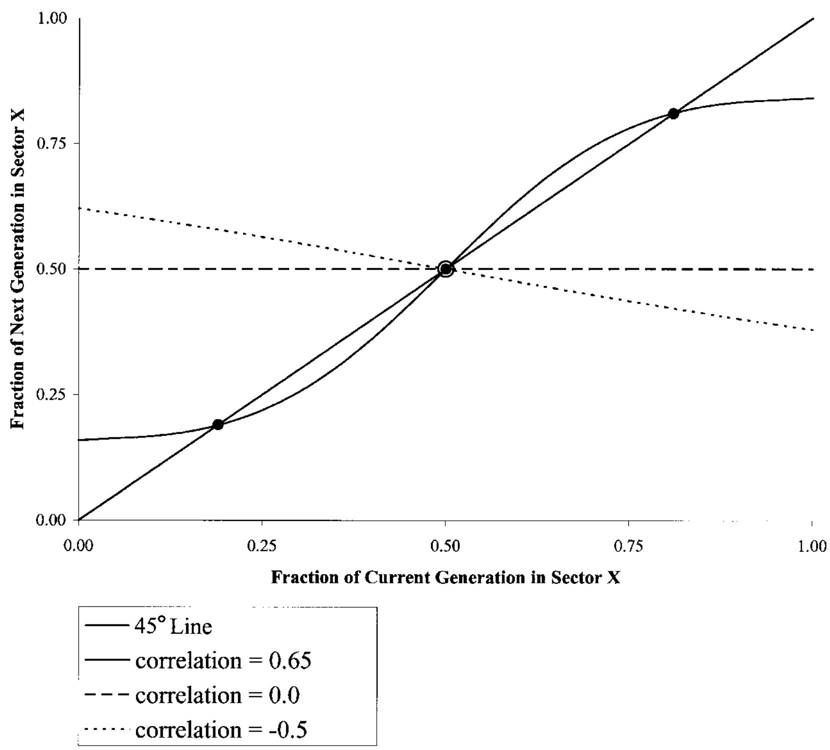

FIG. 3.—Single-period solutions for skill distributions with equal means and variances. Solid (open) circles indicate stable (unstable) steady states.

steady state. Thus, an arbitrarily accurate grid search can be computed over the unit interval. This approach allows us to provide a more complete characterization of the set of possible interior steady states.

Finally, figures 3 and 4, as well as table 1, help illustrate our findings. The figures graph the fraction of the current-period population in sector X as a function of the fraction in that sector in the previous generation. An intersection between one of these transition paths and the 45° line denotes a steady state. The steady state is stable when the transition path crosses the 45° line from above. Solid (open) circles indicate stable (unstable) steady states. For interior steady states corresponding to various skill distributions, the table presents the fraction of the population in sector X, the mean skill level in each sector, and the fraction of the population misallocated to each sector.

A. Identical Skill Distributions

Throughout this subsection, we take the distribution of skills to be identical in the two sectors. Proposition 2 establishes that agents' steady

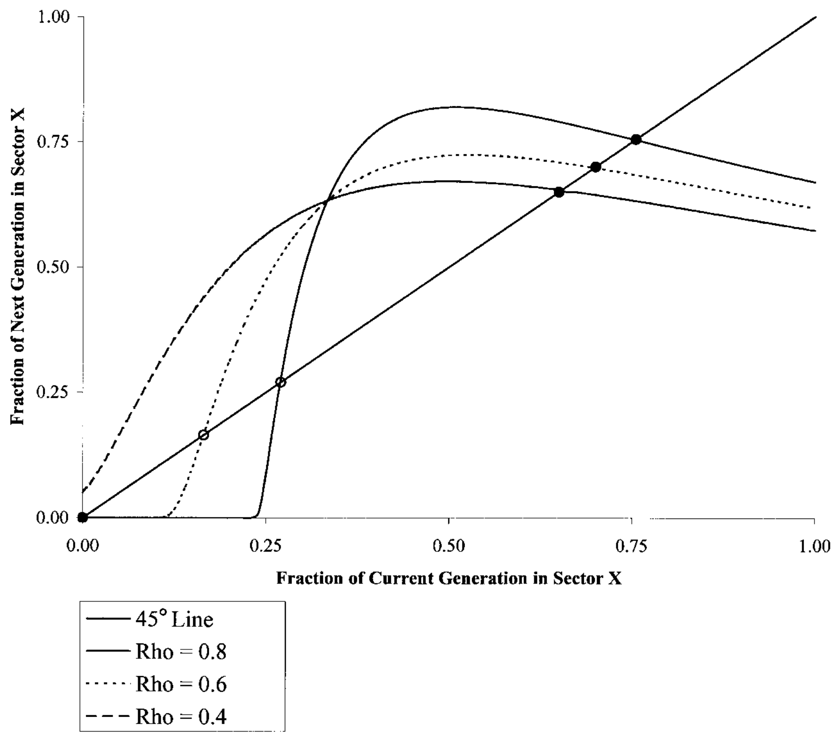

FIG. 4.—Single-period solutions for skill distribution with equal means and the standard deviation in sector X double that of sector Y. Solid (open) circles indicate stable (unstable) steady states.

state choices correspond to their comparative advantage whenever skills correlate nonpositively across sectors.

PROPOSITION 2. When the two sectors have identical skill distributions with a nonpositive correlation, agents allocated according to their comparative advantage is the unique steady state.

This proposition relies on the symmetry in the skill distributions. Under this symmetry, when agents allocate according to comparative advantage, the sector means are equal. Therefore, agents equally skilled in both sectors are indifferent between the two occupations, while everyone else strictly prefers the sector in which they have a comparative advantage. Thus, the comparative advantage allocation is a steady state. The issue to consider now is whether additional steady states exist. Suppose that over half of the population in one sector, say X, is a steady state. If so, there must exist an agent with a comparative advantage in Y who strictly prefers X. However, the symmetry in skill distributions implies that the conditional mean in Y exceeds that in X. (Given the nonpositive skill correlation,

Table 1
The Equilibrium Allocation of Agents under Different Bivariate-Normal Skill Distributions

Distribution	Fraction in Sector X	Mean Skill Level X	Mean Skill Level Y	Fraction Misallocated to Sector X	Fraction Misallocated to Sector Y
Baseline	.50	.56	.56	.00	.00
Correlation:					
.50	.50	.40	.40	.000	.000
.60	.71	.44	−.28	.242	.032
.70	.88	.23	−1.02	.400	.023
.80	.96	.09	−1.69	.469	.009
Difference in means ($\mu_x - \mu_y$):					
.25	.59	.79	.54	.035	.019
.50	.67	.98	.48	.068	.034
1.00	.83	1.30	.30	.105	.036
1.50	.93	1.64	.14	.095	.021
2.00	.98	2.06	.06	.063	.008
Ratio of variances (σ_x^2/σ_y^2):					
2.00	.56	.87	.44	.062	.002
4.00	.60	1.23	.31	.098	.001
9.00	.62	1.81	.20	.118	.000
16.00	.62	2.31	.15	.124	.000

Note.—Deviations from independent standard normal distributions are noted in the table.

both sectors benefit from positive selection bias, regardless of the slope of the indifference line.) But if this is true, anyone with a comparative advantage in Y strictly prefers Y. Hence, having over half of the population in one sector cannot be a steady state.

Figure 3 illustrates proposition 2. As seen in the figure, when the correlation is nonpositive, half of the population in each sector is the only steady state. The figure also illustrates that a positive correlation in skills results in multiple steady states. The comparative advantage allocation remains a steady state but becomes unstable. Two additional stable steady states arise, each a mirror image of the other. In either of the new steady states, individuals are misallocated in both sectors. The larger sector attracts relatively highly endowed agents with a comparative advantage in the smaller sector, while the smaller sector attracts relatively poorly endowed agents with a comparative advantage in the larger sector. Whether sector X or sector Y is larger in the steady state is history dependent. The sector that was initially larger is bigger in the steady state.

The top portion of table 1 illustrates that the degree of positive correlation must be large before the misallocation is noticeable. However, the degree of misallocation quickly increases for positive correlations beyond 0.5. A correlation of 0.8 results in 48% of the population being misallocated.

B. Different Skill Distributions

Next, we turn to the more general case of different skill distributions across sectors. Proposition 3 summarizes our findings for this non–identical distributions case.

Proposition 3. When skill distributions differ across sectors, all steady states deviate from comparative advantage.

The second portion of table 1 describes steady state allocations when the means of the skill distributions differ. When the variances are equal, the sector with the higher mean is larger and enjoys greater social approval (the conditional mean skill level is higher). This may not be surprising, given its higher unconditional mean skill level. However, note that, in spite of the higher mean in X, there is misallocation to both sectors. Similarly, when the means are equal, the higher-variance sector is larger and has greater social approval (see the bottom portion of table 1). Again, there is misallocation to both sectors.

In general, whenever the skill distributions differ, two (potentially competing) incentives for agents to deviate from their comparative advantage exist. Under the comparative advantage allocation, (i) one sector is larger and (ii) one sector commands greater social approval. When the larger sector has greater social approval, agents with equal and high levels of skill in both sectors strictly prefer it. More of the population observes these agents' high level of proficiency when they work in this sector, and outsiders identify them with the higher-social-approval occupation. When the smaller sector has greater social approval, agents with equal and low levels of skill in both sectors strictly prefer it. Less of the population observes their low level of proficiency when they work in this sector, and outsiders associate them with the higher-social-approval occupation. Thus, these two incentives always distort career choices away from the comparative advantage allocation.

In addition, a positive (negative) correlation in skills exacerbates (mitigates) deviations from the comparative advantage allocation of workers.[20]

[20] Unlike in our analysis here, Jovanovic (1982) finds that negatively correlated skills exacerbate overcrowding in the sector with larger variance. The rationale behind these apparently contradictory results is identical. In our model, a negative correlation in skills makes individuals who are mediocre in everything into the ex post low-skilled population. The concern for social status induces these individuals to hide in the smaller sector, decreasing the overcrowding in the high-variance sector. Jovanovic assumes that skills are perfectly observable in the low-variance sector and unobservable in the high-variance sector. Therefore, the high-variance sector is the only location to hide. Thus, in both cases it is the desire of the low-skilled to remain anonymous that drives the results, but it is the difference in assumptions about the observability of skills that reverses the direction of the conclusion.

Both the top portion of table 1 and the interior stable steady states in figure 4 illustrate this finding.

The average gap in an individual's skills across sectors decreases as the correlation in skills increases.[21] Therefore, differences in size and the extent of social approval for the two sectors influence a greater fraction of the population. In other words, as the correlation in skills increases, more people are close to being indifferent, based solely on their own skills. Therefore, more people make decisions based on the social approval accorded to each occupation. Similarly, as differences in the skill distributions increase, a given level of correlation generates a greater distortion. When the marginal distributions differ, one of the sectors is larger. The large sector creates a built-in stage on which the highly endowed can shine, and the smaller sector becomes a hiding place for poorly endowed individuals. For example, when the means differ by half a standard deviation, a correlation of 0.2 results in an additional 6% of the population being misallocated.

Finally, proposition 4 establishes that multiple steady states can occur only when skills correlate positively.

Proposition 4. When skills correlate nonpositively across sectors, a unique steady state exists.

The underlying force behind this result is identical to that of a nonpositive correlation in proposition 1. A nonpositive correlation in skills causes the social approval associated with each sector to benefit from positive selectivity bias. Therefore, as the fraction in sector X increases, the social approval of sector X falls and the social approval in sector Y rises. These two effects combine to decrease the incentive of all those remaining in sector Y to move to sector X, leading to a strictly negatively sloped transition path and a unique steady state. A positive correlation in skills is a necessary but not sufficient condition for multiple steady states. The sufficient conditions are an implicit function of the means and variances of the skill distributions.

In the various steady states discussed so far, we have found that status concerns cause deviations from the efficient allocation in most cases. A question of some interest is: how acute can such a deviation be? Could it result in complete clustering in either sector? We address this issue in the next proposition.

Proposition 5. Complete clustering as a steady state can occur only

[21] More precisely, individual differences in skill level across the two sectors follow a normal distribution, with mean $\mu_x - \mu_y$. The variance of this distribution decreases with the correlation in skills.

in the low-variance sector and only if the correlation in skills is sufficiently high ($\rho \geq \sigma_x/\sigma_y$).[22]

Figure 4 displays three transition paths under distributions in which the standard deviation in sector X is twice that of sector Y and the sector means are equal. When the correlation is 0.4, although the transition path is initially upward sloping, the only steady state remains in the interior. For correlations in excess of 0.5, the corner steady state of nobody in sector X becomes stable. As seen in the figure, the complete clustering steady state will be reached from a larger neighborhood around zero as the correlation increases.

To understand the dynamics of the clustering steady state, suppose that the entire population chooses the low-variance sector. People highly skilled in that sector stay because a large audience recognizes their skill. More important, people with relatively low skill in this sector remain because of the inferences that will be made about them if they were to move. Since highly skilled individuals in the low-variance sector will not switch sectors, an agent who switches must be of relatively low skill. When the positive correlation in skills is sufficiently high (as defined in proposition 5), this individual's expected skill in the high-variance sector is also relatively low. However, a relatively low-skill endowment in the high-variance sector is worse than a relatively low-skill endowment in the low-variance sector. Thus, his status would decrease if he switched.

The reason why extreme clustering is not possible in the high-variance sector is most transparent for bounded distributions. Suppose that both sector endowments have a mean of zero but the range of the high-variance sector is twice that of the low-variance sector. Now, if the entire population resides in the high-variance sector, the worst person in this sector has an incentive to switch to the low-variance sector. Even if the remainder of the population assumes she has the lowest possible endowment in that sector, her status still exceeds what she would receive in the high-variance sector. The same argument applies to two normal distributions, after noting that the distribution with a greater variance effectively has a smaller lower bound.[23]

The result in proposition 5 is significant especially because sectors with lower variance are typically low-skill sectors. Seen in this light, the result suggests that the desire for recognition and approval in one's cohort can

[22] When $\rho = \sigma_x/\sigma_y$, the extreme clustering steady state exists if and only if $2\sigma_x^2 > \sigma_y^2$.

[23] The argument follows from noting two facts about normal distributions. First, the mass of a normal random variable truncated from above approaches unit mass at the point of truncation as the truncation point diverges into the tail. Second, regardless of the population means, the normal distribution with the greater variance eventually has more mass in the tail (where both distributions share a common point defining the tail).

result in all its members choosing low-skill occupations—choices that outsiders to their community may perceive as less desirable, or even self-destructive.

To summarize, the analysis of steady states shows that, except when skill distributions are identical and correlate nonpositively, the desire for social approval results in talent allocations that deviate from what comparative advantage would dictate. When multiple steady states exist, historical accident can result in the same career being prestigious in one community and looked down upon in another. Thus, historical discrimination that denied a particular community access to certain occupations can affect its members' career decisions well after the discrimination is eliminated. These forces can result in widely varying, even contradictory, perceptions regarding different occupations, across communities. Such divergent perceptions put different pressures on young members of these communities. At one end of the spectrum, a high social premium on education results in "serious social and emotional problems for the families of Jewish children unable to handle the intellectual demands of college" to which Glazer and Moynihan refer. Such a community would overinvest in education and possess a bias against (even well-paying) "blue-collar" jobs relative to "white-collar" jobs. At the other end, communities with an "anti-elite bias" underinvest in education. In its most extreme form, such perceptions result in a complete clustering of choices in favor of the low-skill sector. This outcome aligns with the presence of pockets of widespread teenage illegitimacy or juvenile crime in inner city communities, activities with average earnings considerably below more education-oriented careers.

In this context, public policy typically focuses on reducing underinvestment, rather than curbing overinvestment in education. Toward this goal, our analysis suggests a greater role for more group-based schemes, rather than individual merit scholarships (or other financial incentives) alone. This is especially so for areas with high concentrations of crime, illiteracy, and poverty. Akerlof (1997) describes cases that serve as opposite examples of the potential effects of individual-based versus group-based incentives. The tragic death of Eddie Perry, a successful graduate of Phillips Exeter Academy with a full scholarship to Stanford, illustrates why individual incentives may fail. Eddie did not quite fit in at the academy, but he also found himself isolated in his old world of the inner city. His childhood peers had little appreciation of his academic success and ridiculed him because "he didn't even know how to play basketball." A few weeks prior to entering Stanford, he was shot dead while attempting to rob a cop in New York City. A close mentor of Eddie's viewed Eddie's death as a suicide resulting from his isolation. While in his own community he made a desperate effort to fit in, in a different community Eddie may have been considered a star. On the other hand, Akerlof's description of the unique experiment by Eugene Lang points to the potential of community-based initiatives. Lang guaranteed a college scholarship to an entire class of sixth-grade boys in Harlem, New York.[24] Six years later, 40 out of the 51 boys had done well enough to be able to enter college without Lang's financial assistance. This outcome stands in sharp contrast to the story of individual success, and eventual failure, described above.

V. Discussion and Conclusion

We have focused on a particular aspect of social approval, one that derives from occupational status, and we have considered the implications for an individual's choice of profession. One of the highlights of the model is that it provides microeconomic foundations to this notion of occupational status. In light of this, we examine the generality of the basic elements of our model. Then we conclude.

A. Discussion

We discuss the robustness of the model and our findings to four extensions: alternative (nonnormal) skill distribution, wages directly entering the utility function, peer effects, and human capital investment.

Alternative skill distributions. Two properties of the normal distribution merit discussion. The distribution is unbounded, and a single correlation completely summarizes the relationship between skills across the two sectors. An unbounded distribution allows the social approval of a sector to diverge to minus infinity, which helps establish the complete clustering steady state. However, this steady state (or one very close to the boundary) remains so long as less mass resides in the lower tail of the empty (smaller) sector relative to the sector in which people cluster. Also, the degree of correlation necessary for complete clustering rises as the mass in the lower tails of the distributions increases.

For a bivariate normal distribution, an individual's skill in one sector is a linear function of her skill in the other sector plus a homoscedastic error term. The correlation determines the slope of this function. Both the constant slope and the homoscedastic error term limit the number of potential steady states to two or less. Switching to a distribution that relaxed either of these properties could increase the number of potential equilibria.

Wage effects. In general, bringing wages back into the model mitigates, but does not reverse, the effects of social status. For instance, the complete clustering steady state described in proposition 5 persists. In this steady state, the negative selection bias in the high-variance sector drives social approval to minus infinity in that sector. No finite wage

[24] This story is taken from Ellwood (1988).

discrepancy could compensate for an infinite loss in approval. With a bounded distribution, as described above, the loss in social approval becomes bounded. In this case, wages may move this steady state to the interior or eliminate it.

Peer effects. Not only elders but also peers influence youths' choices. When solving for the steady states of the model, it was mathematically convenient to assume that the perceptions of the older cohort solely influence young agents. Moreover, allowing peers' behavior to influence choices leaves the steady states of the model unaltered. In any steady state, the current and previous generations behave identically, so the relative weights given to each is irrelevant. However, multiple single-period equilibria become more likely with peer effects.[25] In the limit, if young agents only care about the opinions of their peers, history is irrelevant. The steady state and single-period equilibria become identical. Which steady state occurs is the outcome of a pure coordination game in which expectations over others' behavior are paramount. In this case, public policy can play a role in shaping those expectations and, hence, the outcome.

Human capital investment. Including human capital investment in the model results in the ex ante correlation in potential skills exceeding the ex post correlation in realized skills. One could interpret our results to include the case of investment in skills, so long as one construes the correlation in skills discussed throughout the article as the level of correlation in ex ante potential.

B. Conclusion

This article has examined how varying social perceptions about the status of different occupations emerge endogenously across communities and how these perceptions affect educational and occupational choices at the local level. In our framework, agents care about social assessment of their ability in their chosen occupation, but individuals better assess ability of those in their own occupation than of those in another. When skill distributions differ across occupations and/or correlate positively, the combination of a desire for social approval and imperfect assessment of ability distorts individual choices away from their comparative advantage. One sector develops into the preferred sector and has greater social approval associated with it. Under a positive skill correlation across sectors, two stable steady states can arise. However, both steady states misallocate people relative to their comparative advantage: some communities overinvest in education, while others may be caught in a low-education trap. Which steady state a community finds itself in depends upon history. The model explains how historical discrimination that denied some groups

[25] Multiple single-period equilibria also do exist without peer-group effects. See L3 in fig. 2.

access to particular occupations could influence current perceptions and hence career choices in such groups. In this context, the model points to the role of group-based as opposed to individual-based incentives as powerful policy instruments to move a community out of a low-education steady state.

Appendix

Proofs

This appendix contains proofs of the lemmas and propositions stated in the text. In some instances, we sketch proofs in order to conserve space.

A. Proof of Lemma 1

The conditional mean skill level in sector Y is

$$E\{y \mid y > y_0 + mx\} = E\{y \mid y - mx > y_0\}.$$

Let $\tilde{z} = z - \mu_z$; then $y = \mu_y + a(\tilde{y} - m\tilde{x}) + \nu$, where $\mathrm{Cov}(\nu, \tilde{y} - m\tilde{x}) = 0$ by construction and

$$a = \mathrm{Cov}(y, y - mx)/\mathrm{Var}(y - mx) = (\sigma_y^2 - m\sigma_{xy})/\sigma^{*2},$$

where $\sigma^{*2} \equiv \mathrm{Var}(y - mx)$. Substituting in for y yields

$$\begin{aligned}
&E\{y \mid y > y_0 + mx\} \\
&= \mu_y + E\{a(\tilde{y} - m\tilde{x}) + \nu \mid y - mx > y_0\} \\
&= \mu_y + aE\{(\tilde{y} - m\tilde{x}) \mid y - mx > y_0\} + E\{\nu \mid y - mx > y_0\} \\
&= \mu_y + a\sigma^* E\left\{\frac{(\tilde{y} - m\tilde{x})}{\sigma^*} \mid \frac{(\tilde{y} - m\tilde{x})}{\sigma^*} > \frac{y_0 - (\mu_y - m_x)}{\sigma^*}\right\} \\
&= \mu_y + a\sigma^* \lambda(y_0^*), \\
&= \mu_y + \rho_y \sigma_y \lambda(y_0^*),
\end{aligned}$$

where $y_0^* = [y_0 - (\mu_y - m\mu_x)]/\sigma^*$, $\lambda(y_0^*)$ is the inverse Mills ratio and $\rho_y = \mathrm{corr}(y, y - mx)$. Similar manipulations yield the conditional mean in sector X. QED

B. Proof of Proposition 1

Continuing with the notation from the lemma, substitute the closed-form solution for the sector mean endowment levels into the expression for y_0 to get

$$y_0 = \bar{x} - m\bar{y} = -\rho_x \sigma_x \lambda(-y_0^*) - m\rho_y \sigma_y \lambda(y_0^*).$$

Take derivatives of both sides, yielding

$$\partial y_0/\partial y_0 = 1$$

and

$$\partial[-\rho_x\sigma_x\lambda(-y_0^*)-m\rho_y\sigma_y\lambda(y_0^*)]/\partial y_0$$
$$=(1/\sigma^*)[\rho_x\sigma_x\delta(-y_0^*)-m\rho_y\sigma_y\delta(y_0^*)].$$

There are two cases to consider. First, when $\sigma_{xy}\leq\min\{\sigma_y^2/m, m\sigma_x^2\}$, $\rho_x\leq 0$, $\rho_y\geq 0$. In this case, both terms for the right-side derivative are nonpositive. So, the right-hand side weakly decreases and the left-hand side strictly increases, resulting in a unique solution.

Second, when $\sigma_{xy}>\min\{\sigma_y^2/m, m\sigma_x^2\}$, one of the above correlations changes sign. However, it is not possible for both to change sign. Assume that $\rho_x>0$ and $\rho_y<0$. Then, $\sigma_{xy}>\sigma_y^2/m$ and $\sigma_{xy}>m\sigma_x^2$. Therefore, $\sigma_{xy}^2>(\sigma_y^2/m)(m\sigma_x^2)=\sigma_y^2\sigma_x^2$, which implies that the correlation in skills between the two sectors exceeds one. This result creates a clear contradiction. The remaining two possibilities are mirror images of each other, with the right-hand side being a convex function when both correlations are negative and concave when both correlations are positive. The second derivative of the right-hand side demonstrates this relationship:

$$\partial^2[-\rho_x\sigma_x\lambda(-y_0^*)-m\rho_y\sigma_y\lambda(y_0^*)]/\partial y_0^2$$
$$=-\frac{1}{\sigma^{*2}}\left[\rho_x\sigma_x\frac{\partial\delta(-y_0^*)}{\partial(-y_0^*)}+m\rho_y\sigma_y\frac{\partial\delta(y_0^*)}{\partial y_0^*}\right],$$

which is always negative (positive) when both correlations are positive (negative). (Heckman and Honoré [1990] demonstrate that $\partial\delta(y_0^*)/\partial y_0^*$ is positive.)

Therefore, the solution can take one of four forms that range in the number of fixed points from zero to two. In addition, there exists the possibility of another solution in the limit at y_0 equal to plus or minus infinity. Figure A1 illustrates the four possibilities for the convex case.

Line *A* in figure A1 depicts the standard case in which there is a unique solution. However, as the correlation increases, the slope of the line increases, eventually becoming positive (when ρ_y is negative, i.e., $\sigma_{xy}>\sigma_y^2/m$). There exists a range of correlations for which the slope is positive but less than one. Line *B* illustrates this case and depicts the two solutions: the interior fixed point depicted in the graph and the limiting point of y_0 equal to plus infinity. However, the limiting point is unstable. As the correlation gets even stronger, the slope of the function will exceed one. Line *C* shows that, when this occurs, there are two interior fixed points. The first is stable, while the second is unstable. In addition, the limiting point of y_0 equal to plus infinity becomes a stable solution. Finally, for correlations sufficiently close to one, the function never dips below the 45° line. Line *D* makes clear that the limiting point of y_0 equal to plus infinity is the only fixed point, and it is stable.

Therefore, in all cases but line *C*, there exists a unique single-period stable equilibrium. However, for the range of correlations corresponding

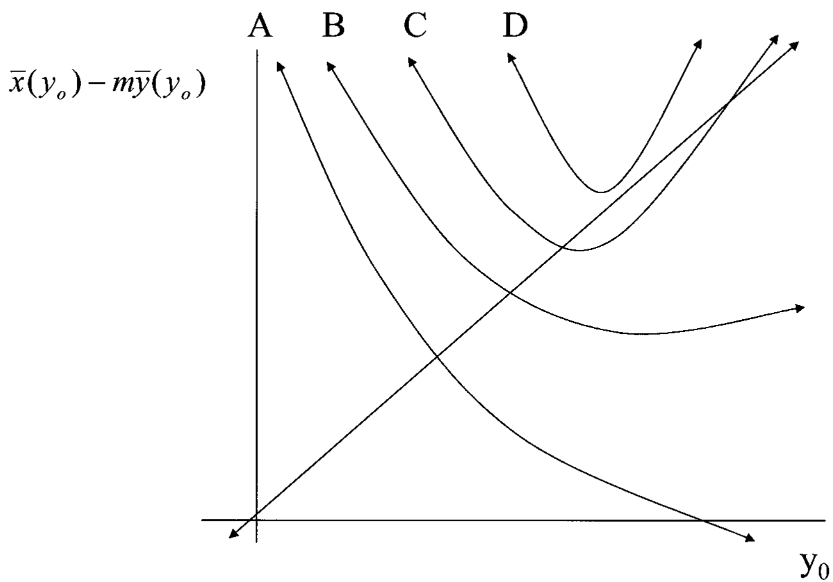

FIG. A1.—The fraction of the current populations desiring sector X as a function of the fraction actually choosing sector X. Solution to the single-period problem must lie on the 45° line.

to line *C*, there are two stable equilibria: one in the interior and the other with the entire population in one sector. Q.E.D.

C. Proof of Proposition 2

Start with the case of no correlation between the sector endowments. Without loss of generality, assume a standard normal distribution of endowments in each sector. By proposition 1, exactly one solution to the single-period problem exists for each value of m. Guess $y_0 = 0$ as that solution, which corresponds to half of the current population in each sector and an indifference line running through the origin. By lemma 1, the sector means would be $\bar{x} = m \cdot \lambda(0)/\sigma^*$ and $\bar{y} = \lambda(0)/\sigma^*$. To verify the hypothesized solution, it is sufficient to check that one individual on the indifference line is actually indifferent between the two sectors. Consider the individual with endowment {0, 0}. She receives status of $\theta\bar{x}$ if she works in sector X and status of $(1 - \theta)\bar{y}$ if she opts for sector Y. These are equal if $\bar{y}/\bar{x} = \theta/(1 - \theta)$. The right-hand side of this equation equals m by definition, and the left-hand side is equal to m as well (take the ratio of the means computed above). Therefore, half of the population in each sector is the single-period solution regardless of the distribution of old agents and the unique steady state.

Now, turn to the case of negative correlation in endowments. By inspection, it is relatively easy to demonstrate that the efficient allocation remains a steady state. To prove uniqueness, suppose that there exists an equilibrium in which the older generation is disproportionately in one sector. There are two changes relative to the case of zero correlation: (1) the mean in the smaller sector rises, while the mean in the larger sector falls; and (2) the fraction of the population with less than any given difference in skill between the two sectors decreases. The first fact decreases the incentive to enter the larger sector by reducing the gain in social approval. In other words, the maximum drop in ability an individual can incur and still find it optimal to switch to the larger sector decreases. The second fact states that there are fewer agents with a gap sufficiently small. Therefore, fewer agents enter the larger sector. Recalling that the solution to the single-period problem with zero correlation had half of the population choosing the larger sector, negative correlation must result in less than half of the population choosing the larger sector. This fact contradicts the assumption that we were in a steady state. Therefore, the efficient steady state is unique. Q.E.D.

D. Proof of Proposition 3

Initially, establish the existence of a stable steady state. Any steady states must satisfy the equation $\theta = F(\theta)$, where

$$F(\theta) = \int_{-\infty}^{\infty} \left\{ \int_{-\infty}^{y_0(\theta)+m(\theta)x} f(x, y)dy \right\} dx.$$

Since $\theta \in [0, 1]$ and $F(\theta)$ is a single-valued continuous function from $[0, 1]$ into itself, Brouwer's Fixed Point Theorem guarantees the existence of at least one stable steady state.

Now demonstrate that the allocation based solely on comparative advantage is not a steady state. First, consider the case in which both sectors have the same mean and different variances. Assume that the comparative advantage allocation is a steady state. Then the indifference line runs through the origin ($y_0 = 0$) and the sectors are of equal size. By lemma 1, the mean skill level employed in sector X minus that of sector Y equals $(\sigma_x^2 - \sigma_y^2)\lambda(0)/\sigma^*$. In other words, the conditional mean in the high-variance sector exceeds that of the low-variance sector. Therefore, an agent endowed with skills $\{0, 0\}$ strictly prefers the high-variance sector, since the greater skill in that sector increases her social approval. Therefore, the indifference line does not run through the origin, creating a contradiction.

Second, consider the case in which the means differ across the two sectors. Again assume that the comparative advantage allocation is a steady state. Then the indifference line runs through the origin with slope one. Under this indifference line, the high-mean sector is larger. Recall that the slope of the indifference line is the ratio of the sector sizes. Therefore, the slope of the indifference line is not one, which contradicts the assumption that the comparative advantage allocation is a steady state. Q.E.D.

E. Proof of Proposition 4

All steady states satisfy the equation $y_0(\theta) = \bar{x}(y_0(\theta)) - m(\theta) \cdot \bar{y}(y_0(\theta))$. Differentiate both sides with respect to θ. The left-hand side strictly increases with θ, $\partial y_0(\theta)/\partial\theta > 0$. Three terms make up the right-hand side. Note that m is a strictly decreasing function of θ, $\partial m(\theta)/\partial\theta < 0$. Lemma 1 demonstrates that $\partial\bar{x}(y_0)/\partial y_0 < 0$ and $\partial\bar{y}(y_0)/\partial y_0 > 0$ for a nonpositive correlation. Therefore, $\partial\bar{x}(y_0(\theta))/\partial\theta < 0$ and $\partial\bar{y}(y_0(\theta))/\partial\theta > 0$. Putting the three terms together demonstrates that the right-hand side strictly decreases with θ. Thus, at most, one steady state exists. As in proposition 3, Brouwer's Fixed Point Theorem guarantees the existence of at least one stable steady state. Therefore, exactly one steady state exists. Q.E.D.

F. Proof of Proposition 5

Proposition 1 demonstrates that the entire population in sector X is a possible single-period equilibrium if and only if the derivative of $\bar{x}(y_0) - m\bar{y}(y_0)$ with respect to y_0 exceeds one when evaluated at $y_0 = \infty$. Recall that this derivative is $(1/\sigma^*)[\rho_x\sigma_x\delta(-y_0^*) - m\rho_y\sigma_y\delta(y_0^*)]$. Also, $\delta(\infty) = 1$ and $\delta(-\infty) = 0$. So, this derivative exceeds one when evaluated at $y_0 = \infty$ if $-m\rho_y\sigma_y/\sigma^* > 1$. After substituting in for ρ_y and σ^*, this expression becomes

$$m^2[\sigma_{xy} - \sigma_x^2] + m[2\sigma_{xy} - \sigma_y^2] - \sigma_y^2 > 0.$$

If extreme clustering were to be a steady state, m would be infinite. Given that the first term on the left-hand side of the above equation is quadratic, the condition holds if $\sigma_{xy} > \sigma_x^2$, which simplifies to $\rho > \sigma_x/\sigma_y$. Since $\rho \leq 1$, this final condition can only hold if $\sigma_x/\sigma_y < 1$, which implies that sector X is the low-variance sector. Q.E.D.

References

Akerlof, George. 1997. Social distance and social decisions. *Econometrica* 65 (September): 1005–27.

Banerjee, Abhijit, and Andrew Newman. 1993. Occupation choice and the process of economic development. *Journal of Political Economy* 101 (April): 274–98.

Bernheim, B. Douglas. 1994. A theory of conformity. *Journal of Political Economy* 102 (October): 841–77.

Bertrand, Marianne, Erzo Luttmer, and Senhil Mullainathan. 2000. Network effects and welfare culture. *Quarterly Journal of Economics* 115 (August): 1019–55.

Bisin, Alberto, and Thierry Verdier. 1998. On the cultural transmission of preferences for social status. *Journal of Public Economics* 70 (October): 75–97.

Borjas, George. 1995. Ethnicity, neighborhoods, and human capital externalities. *American Economic Review* 85 (June): 365–90.

Ellwood, David. 1988. *Poor support: Poverty in the American family*. New York: Basic Books.

Fershtman, Chaim, Kevin Murphy, and Yoram Weiss. 1996. Social status,

education, and growth. *Journal of Political Economy* 104 (February): 108–32.
Fershtman, Chaim, and Yoram Weiss. 1993. Social status, culture, and economic performance. *Economic Journal* 103 (July): 946–59.
Frank, Robert. 1985. *Choosing the right pond.* Oxford: Oxford University Press.
Galor, Oded, and Joseph Zeira. 1993. Income distribution and macroeconomics. *Review of Economic Studies* 60 (January): 35–52.
Glazer, Nathan, and Daniel Moynihan. 1970. *Beyond the melting pot: The Negroes, Puerto Ricans, Jews, Italians, and Irish of New York City.* Cambridge, MA: MIT Press.
Heckman, James, and Bo Honoré. 1990. The empirical content of the Roy model. *Econometrica* 58 (September): 1121–49.
Jones, Stephen. 1984. *The economics of conformism*. Oxford: Blackwell.
Jovanovic, Boyan. 1982. Favorable selection with asymmetric information. *Quarterly Journal of Economics* 97 (August): 535–39.
Kohn, Melvin, and Carmi Schooler. 1969. Class, occupation, and orientation. *American Sociological Review* 34 (October): 659–78.
Piketty, Thomas. 1998. Self-fulfilling beliefs about social status. *Journal of Public Economics* 70 (October): 165–83.
Roy, A. D. 1951. Some thoughts on the distribution of earnings. *Oxford Economics Papers* 3 (June): 135–46.
Wilson, William Julius. 1987. *The truly disadvantaged: The inner city, the underclass, and public policy*. Chicago: University of Chicago Press.