Economics Letters 120 (2013) 292–296

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

Multi-trait matching and gender differentials in intergenerational mobility[☆]

Natalie Chen[a,b,*], Paola Conconi[c,b], Carlo Perroni[a]

[a] University of Warwick and CAGE, UK
[b] CEPR, UK
[c] Université Libre de Bruxelles (ECARES), Belgium

HIGHLIGHTS

- Market and non-market traits can be transmitted from parents to children.
- Gender mobility differences arise if market traits affect more men's marital status.
- Gender mobility differences arise the more persistent market traits are.
- A rise in the importance of market traits for women lowers both genders' mobility.

ARTICLE INFO

Article history:
Received 12 February 2013
Received in revised form
16 April 2013
Accepted 19 April 2013
Available online 24 April 2013

JEL classification:
C78
J12
J31
J62

Keywords:
Social mobility
Matching
Inheritance
Wage gap

ABSTRACT

We describe a model of multi-trait matching and inheritance in which individuals' attractiveness in the marriage market depends on their market and non-market characteristics. Gender differences in social mobility can arise if market characteristics are relatively more important in determining marriage outcomes for men than they are for women, and if they are more persistent across generations than non-market characteristics. A reduction in gender based discrimination in the labor market increases homogamy in the marriage market and lowers social mobility for both genders.

1. Introduction

We provide a theoretical rationale for the observed gender differential in intergenerational social mobility.[1] We develop a simple model of two-sided matching and inheritance, in which individuals' attractiveness in the marriage market depends on their market and non-market traits. Market traits encompass individuals' characteristics that affect their earning potential in the labor market. Non-market traits encompass a range of other attributes that directly affect an individual's productivity in household production activities.

Market traits are, by definition, comparatively more dependent on the economic environment for their transmission than non-market traits are; *ceteris paribus*, this should make them intergenerationally more stable—for example, capital market imperfections that constrain human capital investment for the children of lower income individuals would imply that differences in cognitive ability between parents and their children would not readily translate into differences in earning ability. At the same time, persistent gender discrimination in the labor market implies that, *ceteris paribus*,

☆ Research funding from the ESRC is gratefully acknowledged. Research funding from the FNRS and the European Commission is gratefully acknowledged by Paola Conconi. We wish to thank Jorge Duran, Georg Kirchsteiger, Andy Newman, Patrick Legros and Nicolas Sahuguet for their comments and suggestions. The usual disclaimer applies.

* Correspondence to: Department of Economics, University of Warwick, Coventry CV4 7AL, UK. Tel.: +44 24 7652 8419; fax: +44 24 7652 3032.
E-mail address: N.A.Chen@warwick.ac.uk (N. Chen).

1 See, for example, Hirvonen (2008).

0165-1765/$ – see front matter © 2013 Published by Elsevier B.V.
http://dx.doi.org/10.1016/j.econlet.2013.04.034

market traits have a lower weight for women than they do for men in determining an individual's success in the marriage market.

In our model, the combination of these two asymmetries implies that women should be more socially mobile than men, and that a reduction in gender based inequality should lower intergenerational mobility for both men and women.

2. Multi-trait matching and inheritance

Consider a population of two genders, males and females, with an equal number of individuals of each gender who can only match with one individual of the opposite gender. Each individual possesses certain levels of two characteristics, x and y. In our analysis, we think of y as capturing various market-related traits that directly affect an individual's productivity in labor-market activities and thus his or her earning potential. The variable x captures instead a range of other attributes that determine an individual's productivity in household production activities, but have little impact on labor market productivity.

Matching is gendered and involves nontransferabilities (Legros and Newman, 2007). For each individual, the levels of x and y combine to determine his or her attractiveness as a partner. In particular, the "desirability" of individual i of gender $G = F, M$ and with characteristics (x_i, y_i) is captured by the function $h_i^G(x_i, y_i)$, $G = F, M$. This index provides an objective ranking for each individual of each gender in terms of his or her attractiveness to the other gender. Notice that the attractiveness function h is gender-specific, since various factors can lead to differences in the relative importance of market and non-market characteristics for men and women. These factors include differential earnings in the labor market—which our analysis will focus on—but also biological differences in reproductive roles and the persistence of traditional gender roles within households.

We assume that non-market services (household production activities) can be substituted for by market services—but not the reverse. Suppose that x represents non-market productivity expressed in money equivalent units (i.e., in terms of the cost of the substitute market services) and y the unadjusted market productivity. Male and female market earning rates are denoted by w^M and w^F, respectively. An individual's attractiveness, which depends on his or her contribution to a partnership, is then given by

$$h_i^G = x_i + w^G y_i, \quad G = F, M. \tag{1}$$

Given a population of n males and n females, a matching equilibrium will feature (perfectly) positive assortative matching (Becker, 1973) in terms of gender-specific rank positions: the male with the highest h^M will match with the female with the highest h^F, the male with the second highest h^M will match with the female with the second highest h^F, and so on.

The inheritance process is modeled as follows. Each couple has two children, a daughter and a son. Inheritance of the two traits is assumed to be stochastic and to be captured by exogenous transition probabilities. These are the same across genders, but can differ across characteristics, reflecting both biological and institutional factors.

For simplicity, suppose that the process of inheritance is gender-segregated in the sense that daughters only inherit characteristics from their mothers and sons from their fathers. The level of non-market trait for a son (daughter) whose father (mother) has a level of a trait $c = x, y$ equal to c' is then

$$c'' = c' + \epsilon_c, \tag{2}$$

where ϵ_c $(c = x, y)$ are independently distributed shock terms with values $\{-\delta, 0, \delta\}$ $(\delta > 0)$. Denoting with $\bar{c}$ the mean level of a given trait, the probability of a positive shock $(\epsilon_c = \delta, c = x, y)$ is

$$\pi_c = \begin{cases} \overline{\pi}_c & \text{if } c' \le \bar{c}; \\ \underline{\pi}_c = \beta\overline{\pi}_c & \text{if } c' > \bar{c}; \end{cases} \tag{3}$$

with $0 < \beta < 1$, implying $\underline{\pi}_c < \overline{\pi}_c$; the reverse being the case for negative shocks, i.e., the probability of a negative shock $(\epsilon_c = -\delta)$ is

$$\pi_c = \begin{cases} \overline{\pi}_c & \text{if } c' \ge \bar{c}; \\ \underline{\pi}_c = \beta\overline{\pi}_c & \text{if } c' < \bar{c}. \end{cases} \tag{4}$$

We assume that $\overline{\pi}_c + \underline{\pi}_c < 1$, which guarantees that the stochastic process defined by (2) is stationary.[2]

The above formulation assumes that the shocks ϵ_x and ϵ_y are uncorrelated. This implies that the traits x and y will be independently distributed in the population in the long-run. If n is large, the distribution of traits (and desirability levels) in the population will thus be invariant through time.

3. Gender and social mobility

We focus on a scenario in which each trait can take one of two levels, high $(\overline{\gamma})$ and low $(\underline{\gamma})$, with $\underline{x} = \underline{y} = \underline{\gamma}, \bar{x} = \bar{y} = \overline{\gamma}, \delta = \overline{\gamma} - \underline{\gamma}, \overline{\pi}_x < 1/2, \overline{\pi}_y < 1/2$, and $\beta = 0$.

Our analysis rests on two assumptions related to asymmetries between market and non-market traits. The first assumption has to do with the relative importance of these traits for men and women.

Assumption 1. $w_y^M > w_y^F$.

This implies that the x trait has a higher weight in determining women's desirability than the y trait does, with the reverse being the case for men. Recent studies (e.g., Hitsch et al., 2010) show that non-market characteristics are indeed comparatively more important for women's attractiveness in the mating market than they are for men. In our model, the asymmetry derives from gender based discrimination in the labor market: lower earnings for females imply that their market skills are not as valuable in a partnership.

The second assumption has to do with an asymmetry in the degree of inheritability of market and non-market traits.

Assumption 2. $\overline{\pi}_x > \overline{\pi}_y$.

This implies that the probability of transition from one level to the other is higher for the x trait than for the y trait—in a gender-neutral fashion.

As we show below, taken together Assumptions 1 and 2 result in the prediction that women are intergenerationally more mobile than men in terms of mating rank—and hence household income.

[2] In the above specification the inheritance process is differentiated for the two traits, with the difference reflecting institutional factors that are left unmodeled. An analogous formulation would be one where inheritance is identical for the two traits, but where market productivity depends on intrinsic ability, as represented by the x trait, as well as on educational attainment, which in turn can be limited by parental income (e.g., because of imperfect capital markets). For example, the matching attractiveness of an offspring with characteristics (x'', y'') could be written as $h'' = x'' + wz''$, where the offspring's market productivity, z'', depends positively both on y'' and on parental market productivity, z', according to the mapping $z'' = qy'' + (1-q)z'$. After integrating, this gives

$$z_t = \sum_{j=1}^{\infty}(1-q)^{j-1} q \sum_{i=-\infty}^{t-j+1} \epsilon_i, \tag{5}$$

a process that exhibits less time variability than the underlying process y_t does in our model.