Preference Evolution in Different Marriage Markets

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Introduction

Preferences are often assumed constant over time in the standard economic analysis but usually they are not. Two strands of literature analyze the change in preferences across generations over time:

- Preferences survive based on biological fitnesses

    - Risk preferences: Robson (1996), Roberto and Szentes (2017), Robson and Samuelson (2018)

    - Time preferences: Rogers (1994), Robson and Samuelson (2007, 2009)

    - Social preferences including altruism, reciprocity, morality, civil culture: Guth and Yaari (1992), Guth (1995), Sethi and Somanathan (2001), Alger and Weibul (2012, 2013), Besley and Persson (2018)

- Preferences are transmitted from family and society in a cultural transmission process

    - Cavalli-Sforza and Feldman (1981), Boyd and Richerson (1985), Bisin and Verdier (2000, 2001), Bisin et al (2004), Fernandez et al (2004), Doepke and Zilibotti (2007), Tabellini (2008), Montgomery (2010), Cheung and Wu (2018)

Introduction

- In both strands of literature, preferences are usually inherited from one parent (or from two parents as a unit).

- In reality, preferences are affected by both parents as well as by own choices.

- How men and women pair influences the evolution of preferences.

- In this paper, we systematically study how different two-sided matching technologies (in terms of assortativity) influence preference evolution when agents' preferences are partially inherited from parents and partially by choice.

Main Results

- Theory

    - Two stable equilibria under random matching
        - resembles a coordination game

    - A unique stable equilibrium under assortative matching
        - resembles an anti-coordination game

    - Equilibria under other matching arrangements resemble one of the two

- Implications from effects of temporary and permanent shocks on the evolution of preference

    1. Gender norms in developing countries (arranged marriages versus freewill marriages)

    2. Female labor force participation in developed countries

    3. Capitalistic spirit in preindustrial England

    4. Cultural persistence

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Basic Setting

- A unit mass of men and a unit mass of women every period.

- All men and women pair up, and each pair reproduces two children, one son and one daughter.

- Men have two types: a and b

  (example: a represents a preference for a working wife, b is the opposite).

- Before marriage, women have two actions: a and b

  (example: a represents participation in the labor force, b is the opposite).

- The cost of action a denoted by $c \sim F(c)$.

  Assume the density f is single-peaked: there exists a $\widehat{c}$ such that
  $f(c) \leq f(c') \leq f(\widehat{c})$ for any c and c' such that $c < c' \leq \widehat{c}$ or $c > c' \geq \widehat{c}$.

Basic Setting

- $u_{t_w t_m}$: an type-t_w woman's utility from marrying a type-t_m man.

- Assume homophily in types: $u_{aa} > u_{ab}$ and $u_{bb} > u_{ba}$.

- After choosing their actions, all women enter the marriage market to find a male partner. Who they can marry is determined by the matching technology in the marriage market.

- The cost, the utility from marrying, and the matching technology jointly determine a woman's incentive to choose *a* or *b*.

Intergenerational Transmission

- Let $\alpha_m(t_m, t_w)$ denote the probability that a son adopts type a given his father's type $t_m \in \{a, b\}$ and his mother's type $t_w \in \{a, b\}$.

- Example 1: $\alpha_m(a, a) = 1, \alpha_m(a, b) = \alpha_m(b, a) = \frac{1}{2}, \alpha_m(b, b) = 0$
  (homogamy marriage has a superior transmission technology (Bisin and Verdier (2000))

- Example 2: $\alpha_m(t_m, a) = 1, \alpha_m(t_m, b) = 0$
  (son's preferences are influenced by mother's actions (Fernandez et al (2004))

- For exposition, we use example 2.

Dyanmic and Equilibrium

- Let p_t denote the proportion of type-a men and q_t denote the proportion of action-a women in period t.

- Given example 2, the dynamic is simply $p_{t+1} = q_t$.

- In a stationary equilibrium, each woman chooses her action to maximize her expected payoff, and the proportions of type-a men are the same across periods ($p^* = q^*$).

- An equilibrium is characterized by a cut-off cost c^* for women.

- Standard stability concept for difference equation applies.

Matching Technologies

- Matching technologies are characterized by assortativity.

- Random matching: high frictions, people cannot sort according to types.

- Assortative matching: types are assortatively matched, though women may need to compete with one another when there is a shortage of men of the same type.

- Mixed matching: some randomly match and others sort.

Random Matching

A woman chooses a if and only if

$$\underbrace{p_t u_{aa} + (1 - p_t)u_{ab}}_{\text{payoff of a}} - c \geq \underbrace{p_t u_{ba} + (1 - p_t)u_{bb}}_{\text{payoff of b}},$$

which rearranges to

$$c \leq c_R(p_t) = \underbrace{(u_{aa} - u_{ba} + u_{bb} - u_{ab})}_{\Delta} p_t + (u_{ab} - u_{bb}).$$

$\Delta > 0$ implies that the more type-a men there are, the more women choose action a.

Random Matching

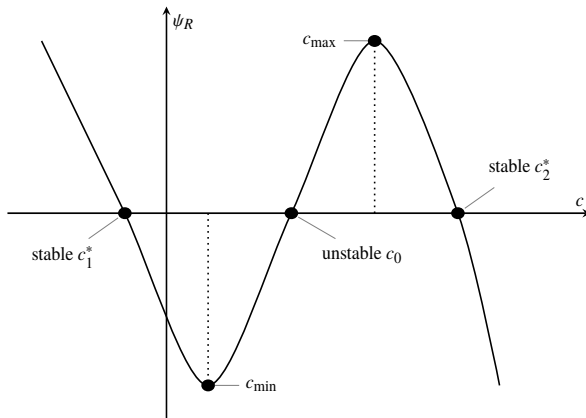- Equilibrium cost cutoff c^* satisfies

$$\psi_R(c) \equiv c_R(F(c^*)) - c^* = 0$$

- Stability depends on

$$\psi_R'(c) = f(c)\Delta - 1$$

Random Matching

The derivative is $f(c)\Delta - 1$.

- Resemble a coordination game: two conventions.
- Women are trying to "coordinate" on the action that matches the prevalent type of men.
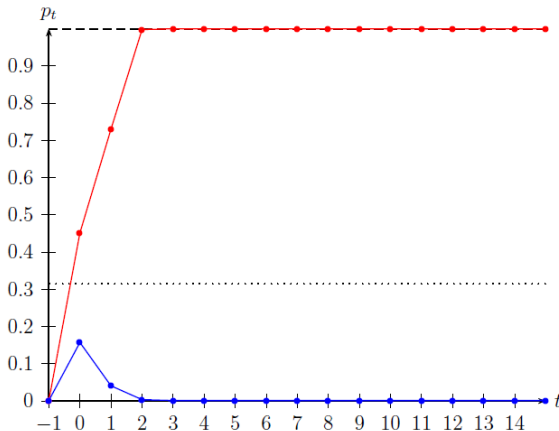
Random Matching

Equilibria under Random Matching

Suppose $f(\widehat{c})\Delta > 1$ and $\psi_R(c_{\min}) < 0 < \psi_R(c_{\max})$. There are two stable equilibria $c_1^* < c_{\min}$ and $c_2^* > c_{\max}$ and one unstable equilibrium $c_0^* \in (c_{\min}, c_{\max})$.

Random Matching

The effect of transitory shocks on the dynamic:

- Only a sufficiently large shock on men's preferences or on women's behavior can shift the equilibrium, e.g. World War II.

Assortative Matching

- Under random matching, women's decisions are purely driven by the distribution of men's preferences.

- Under assortative matching, women are instead playing a game with one another because their decisions take into account what other women choose:

- A woman chooses action a if and only if $c \leq c_A(p_t, q_t)$ where

$$c_A(p_t, q_t) = \begin{cases} \frac{p_t}{q_t} u_{aa} + \left(1 - \frac{p_t}{q_t}\right) u_{ab} - u_{bb} & q_t > p_t \\ u_{aa} - u_{bb} & q_t = p_t \\ u_{aa} - \left(\frac{p_t - q_t}{1 - q_t} u_{ba} + \frac{1 - p_t}{1 - q_t} u_{bb}\right) & q_t < p_t \end{cases}$$

c_A is continuous and strictly increasing in p_t, and is continuous and strictly decreasing in q_t.

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Assortative Matching

- In each period, a unique c_t satisfies

$$c_A(p_t, F(c)) - c = 0$$

- The dynamic is given by

$$p_{t+1}(p_t) = F(c_t(p_t))$$

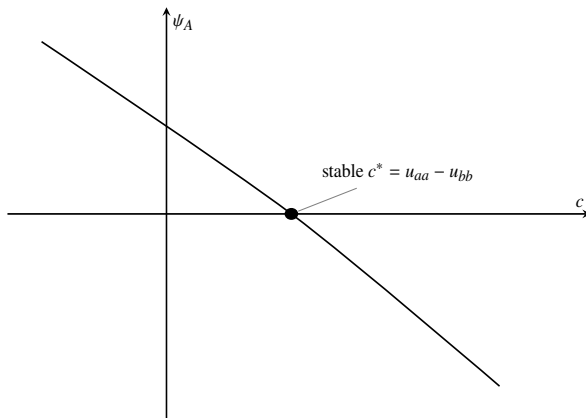- Equilibrium $p^* = q^*$ and cutoff cost c^* satisfy

$$p^* = q^* = F(c^*)$$

$$\psi_A(c^*) = c_A(p^*, q^*) - c^* = u_{aa} - u_{bb} - c^* = 0$$

Equilibria under Assortative Matching

There exists a unique equilibrium $c^* = u_{aa} - u_{bb}$ and $p^* = F(u_{aa} - u_{bb})$, and the equilibrium is stable.
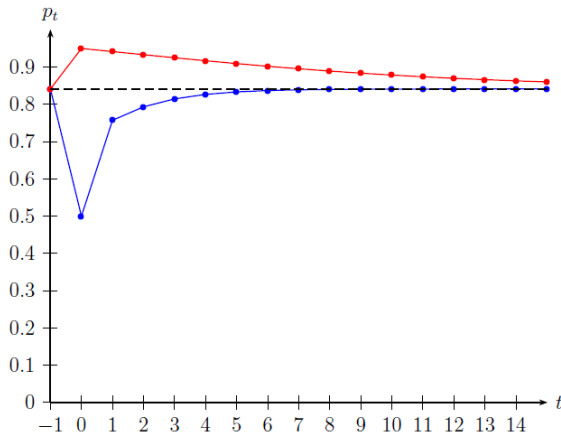
Assortative Matching

stable $c^* = u_{aa} - u_{bb}$

- Resemble anti-coordination game: a unique stable equilibrium.
- When $p_t < p^*$, it attracts an overflow of women choosing action-a, and vice versa.

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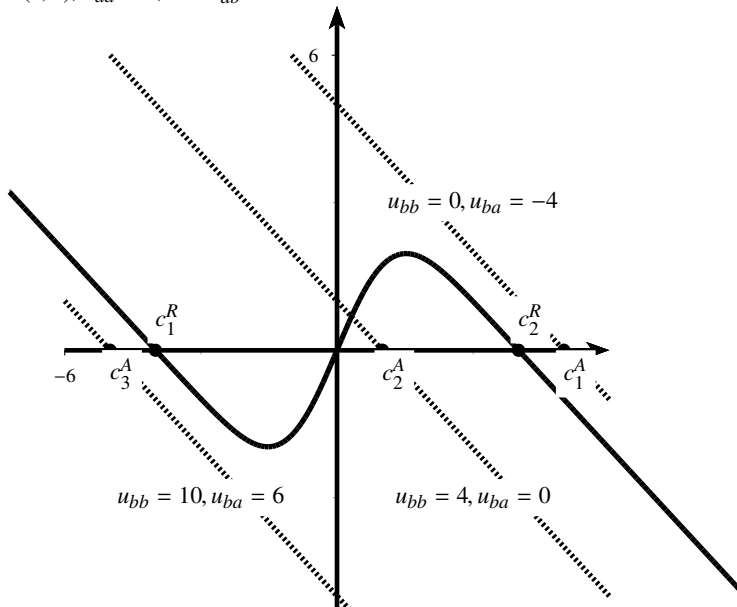○○○

Conclusion
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Assortative Matching

The effect of transitory shocks on the dynamic.

- Any transitory shock has no long-run impact.

Relationships between the Two Matching Technologies

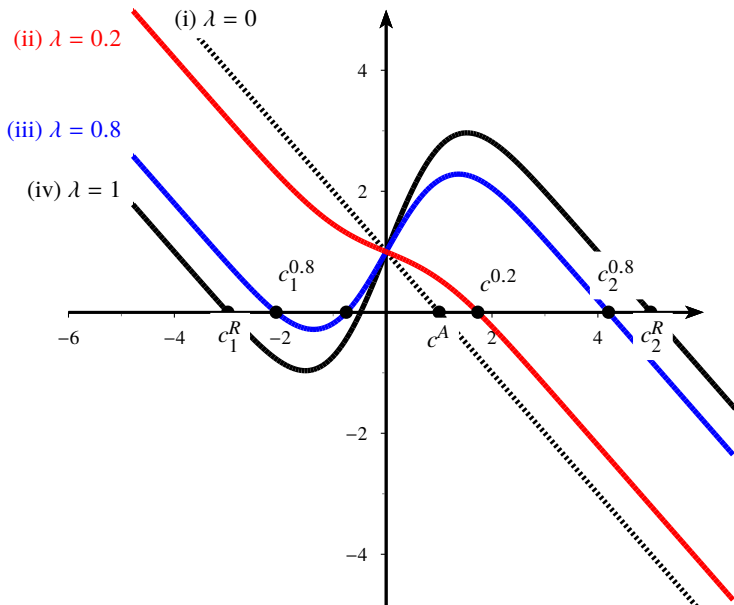Fix $c \sim N(0, 1)$, $u_{aa} = 5$, and $u_{ab} = 1$.

Mixed Matching

Proportion λ randomly match and proportion $1 - \lambda$ marry assortatively.

Critical Degree of Frictions

A unique cutoff λ^* determines the number of stable equilibria: one if $\lambda < \lambda^*$ and two if $\lambda \geq \lambda^*$.

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Illustration

General Model

- Both men and women have two types and two actions to choose from, and the cost of choosing action-*a* varies across types and sexes.

- A flexible transmission process.

- A system of difference equations.

- Same conclusions!

Freewill versus Arranged Marriage

- Arranged marriage:

  - organized locally (smaller market)

  - fewer informational/search frictions

  - assortative along a few preference dimensions (e.g. preference for chastity)

- Freewill marriage:

  - correlated with urbanization/modernization (larger market)

  - more informational/search frictions

  - assortative along many dimensions, so relatively random on the dimensions that families care about in arranged marriage

- Arranged marriage is more assortative than freewill marriage.

Marriage and Gender Norms

- Backward gender role attitudes such as men's preferences for female chastity and practices including child marriage, purdah and female genital circumcision, still persist in societies with arranged marriages.
  Globalization, temporary government campaign, interventions by international agencies have little effects.

- Societies with freewill marriage experienced tremendous transformation towards more equal gender norms and increasing female labor force participation and educational attainment.
  A transitory shock such as WWII can play an important role.

Marriage and the Spirit of Capitalism

- Marriage institution in the pre-industrial England:

    - segregated marriage market for each class.

    - arranged marriage for the upper-landed class.

    - freewill marriage for the middle class including artisans, craftsmen, merchants.

- Characteristics of different classes in terms of preferences

    - Upper-landed class: refined taste for leisure, present consumption

    - Middle class: frugality/thrifty/hardworking/patience

- As a result, the middle class captures the opportunities in the Industrial Revolution and climbed up the social ladder.

- Why the Protestant/Purtian values only spread in the middle class?

Conclusion

- A model of intergenerational transmission of preferences with two-sided marriage market.

- Assortativeness plays a key role in determining the numbers and the properties of equilibria.

- Empirical implications for the effectiveness of transitory shocks on gender norms in developed and developing countries.

THANK YOU!