Intergenerational Transmission of Preferences and the Marriage Market

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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 literatures theoretically model the change in preferences across generations over time:

- Preference evolution 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)
- Intergenerational cultural transmission: 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 the literature, the reproduction is usually assumed to be asexual
- Sexual reproduction needs to be taken into consideration.
- In this paper, we systematically study how different two-sided matching technologies (in terms of assortativeness) influence preference evolution through intergenerational tranmission.

Results

- The equilibria resemble those in a coordination game under random matching.
- The equilibria resemble those in an anti-coordination game under assortative matching.
- Implications
  - labor force participation in developed countries
  - gender norms in developing countries (arranged marriages versus freewill marriages)
  - capitalistic spirit in preindustrial England

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 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

- Let $u_{t_w t_m}$ denote an action-t_w woman's utility from marrying a type-t_m man.
- Assume homophily in types and actions: $u_{aa} > u_{ab}$ 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 action-a or -b.

Intergenerational Transmission

- Let $P(a|f, m)$ denote the probability that a son adopts type-a given his father's type is $f \in \{a, b\}$ and his mother's action is $m \in \{a, b\}$.

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

- Example 2: $P(a|f, a) = 1, P(a|f, b) = 0$ (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 women choosing action-a 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 assortativeness.
- Random matching: high frictions, people cannot sort according to types and actions.
- Assortative matching: types and actions are assortatively matched, though women may need to compete with one another when there is a shortage of likable men.
- Mixed matching: something in between.

Random Matching

- A woman's expected payoff of choosing a is $p_t u_{aa} + (1 - p_t)u_{ab} - c$
- A woman's expected payoff of choosing b is $p_t u_{ba} + (1 - p_t)u_{bb}$
- A woman chooses a if and only if

  $c \leq p_t(u_{aa} - u_{ba}) + (1 - p_t)(u_{ab} - u_{bb}) \equiv C_R(p_t)$ (cutoff cost in period t)
- Write
  $C_R(p_t) = (u_{aa} - u_{ba} - u_{ab} + u_{bb})p_t + (u_{ab} - u_{bb}) = \Delta p_t + (u_{ab} - u_{bb})$.
  ($\Delta > 0$ implies that the more type-a men there are, the more woman choose action a.)

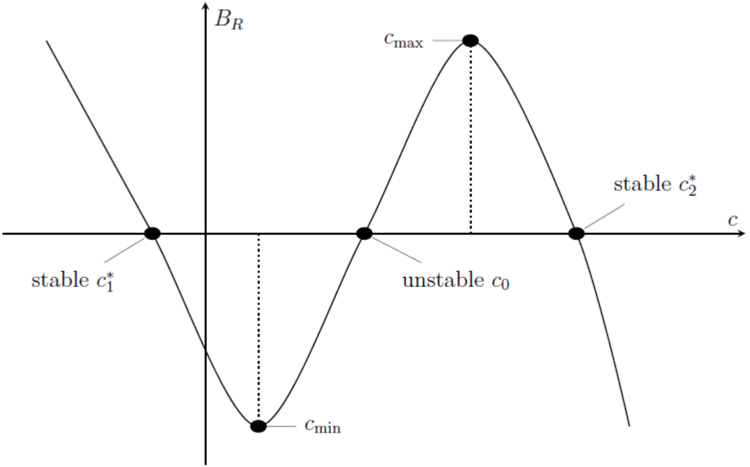
Random Matching

- Dyamic: $p_{t+1}(p_t) = F(C_R(p_t))$.
- Stationary equilibria p^*, satisfies $F(C_R(p^*)) - p^* = 0$ and the equilibrium cost cutoff c^* satisfies
$$B_R(c^*) \equiv C_R(F(c^*)) - c^* = 0.$$
- Stability depends on the derivative of $F(C_R(p)) - p$, which is $f(c)\Delta - 1$. Let $c_{\min}$ and $c_{\max} > c_{\min}$ denote the two solutions of $f(c)\Delta = 1$.

Proposition

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

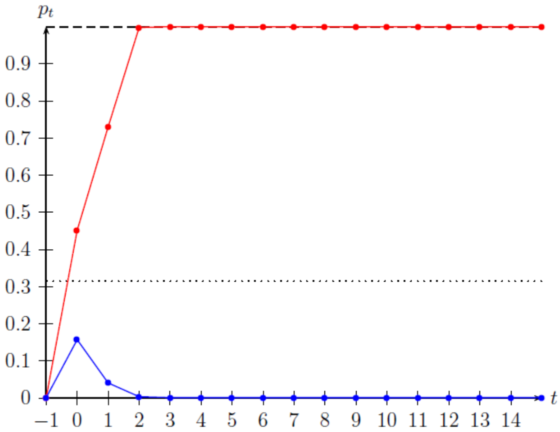
Random Matching



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

Random Matching

The effect of transitory shocks on the dynamic:



- Only a sufficiently large shock on men's preferences or on woman's behavior can shift the equilibrium.

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.

Assortative Matching

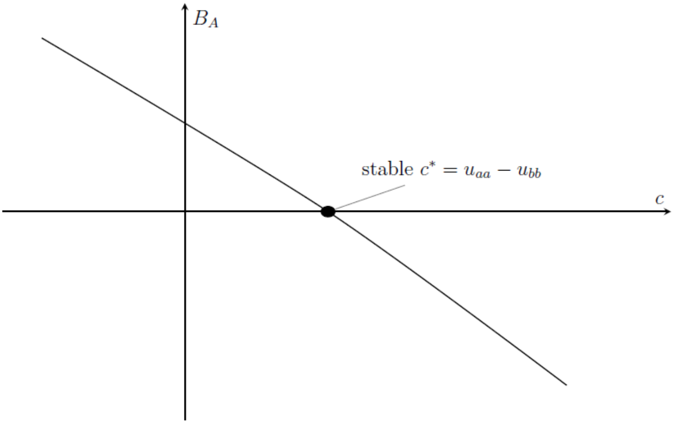
- In each period, a unique c_t, satisfies: $C_A(p_t, F(c)) - c = 0$.
- The dynamic is given by $p_{t+1}(p_t) = F(c_t(p_t))$.
- In a stationary equilibrium, $p^* = q^*$ and the cutoff cost c^* satisifies

$$C_A(p^*, q^*) - c^* = u_{aa} - u_{bb} - c^* = 0, \text{ and } p^* = q^* = F(c^*),$$

Proposition

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

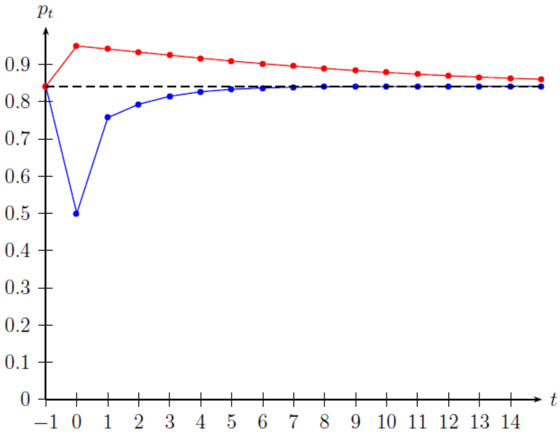
Assortative Matching



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

Assortative Matching

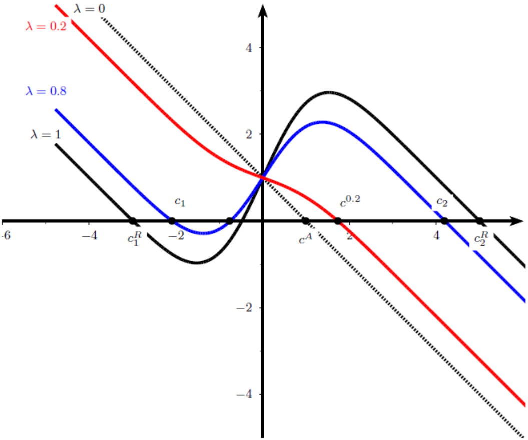
The effect of transitory shocks on the dynamic:



- Any transitory shock has no long-run impact.

Mixed Matching

- Suppose that each person marries according to random matching with probability λ and according to assortative matching with probability $1 - \lambda$. (λ measures the degree of frictions)



- There exists a unique cutoff λ^* that determines the number of equilibria.

General Model

- Both men and women have two types and two actions to choose from, 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.

Conclusion

- A model of inter-generational 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.
- Coevolution of marriage institution and preferences? (Young (1998))