1 Gender Neutral Marriages I: Static Considerations

- Consider a marriage market with M available men and F available women.

- All individuals of the opposite gender are perfect substitutes as spouses, there is no matching in this marriage market.

- Each individual have to choose whether to marry or not.

- The marriage market clears with a transfer τ, paid by a husband to his wife.

- For male m, let his utility from being unmarried be s_m.

- Let his gross utility from being married be α_m. He also has to transfer τ units of resources to a woman if he wants to marry her.

- His net utility from marriage is:

$$\alpha_m - \tau \tag{1}$$

- His net gain, in utility terms, from marriage relative to remaining single, n_m, is:

$$\begin{aligned} n_m &= \alpha_m - s_m - \tau & (2) \\ &= y_m - \tau & (3) \end{aligned}$$

y_m is the gross gain from marriage which is independent of τ.

- Index the males such that the gross gain from marriage, y_m, is decreasing as the index m increases. m ranges from 0 to M. Then $y_{m'} < y_m$ for $m' > m$.

- For female f, let her utility from remaining unmarried be S_f. Let her gross utility of being married be γ_f. She receives τ units of resources from a man if she is willing to marry him. Her net utility from being married is:

$$\gamma_f + \tau \tag{4}$$

- Her net gain, in utility terms, from marriage relative to remaining single, N_f, is:

$$\begin{aligned} N_f &= \gamma_f - S_f + \tau \\ &= Y_f + \tau \end{aligned} \tag{5}$$

Y_f, the gross gain from marriage is independent of τ. Index the females such that the gross gain from marriage, Y_f, is increasing as the index f increases. f ranges from 0 to F.

1.1 Marriage market clearing

- For a given value of τ, the woman f will marry only if

$$N_f = Y_f + \tau \geq 0$$

- Given her optimal behavior, her utility, U_f, will be:

$$\begin{aligned} U_f &= \max[\gamma_f + \tau, S_f] \\ &= \max[N_f, 0] + S_f \end{aligned}$$

Let $\underline{f}$ index the marginal woman. Given τ, $F - \underline{f}$ is the number of women who is willing to marry. Since N_f is increasing in τ, as τ increases, $F - \underline{f}$ increases and more women will want to marry.

2 Social welfare

Consider a utilitarian social welfare function, W, which is the sum of the utilities of all individuals in the society:

$$W = \sum_{0}^{M}(\iota_m \alpha_m + (1 - \iota_m)s_m) + \sum_{0}^{F}(\iota_f \gamma_f + (1 - \iota_f)S_f) \tag{6}$$

where ι_m is an indicator function which equals one if male m is married and zero otherwise. And ι_f is an indicator function which equals one if female f is married and zero otherwise.

W ignores transfers between individuals which are purely redistributive and do not affect aggregate welfare.

Our marriage market equilibrium maximizes the social welfare function, W.

W^*, is:

$$W^* = \sum_{0}^{\mu^*} \alpha_m + \sum_{\mu^*}^{M} s_m + \sum_{0}^{F-\mu^*} S_f + \sum_{F-\mu^*}^{F} \gamma_f$$

2.1 Empirical evidence

- Assuming that leisure is a normal good, an increase in resources available to an individual, holding all other factors constant, will lead the individual to consume more leisure and work less.

- The theory predicts that observed proxies for female labor supply should be negatively correlated with the sex ratio across marriage markets.

- In general, they find that female labor supply is negatively correlated with the sex ratio in a marriage market.

- More often than not, they find that the sex ratio is positively correlated with the marriage rate of women across marriage markets.

3 Caring About Spousal Type & Assortative Matching

- Consider a society with two types of men, m_1 and m_2 where the ability of m_2 men is higher than that of m_1 men. Let there also be two types of women, f_1 and f_2 where the ability of f_2 women is higher than that of f_1 women. The number of m_i men is equal to the number of f_j women for $i = j$.

- Let the total monetary equivalent of the match between m_i men and f_j women be $G(i, j)$ which we also denote as G_{ij}.

For $i < j$ and $k < l$, let

$$G_{jl} + G_{ik} > G_{il} + G_{jk}$$

Assumption 3 says that $\frac{\partial^2 G}{\partial i \partial j} > 0$.

- Assume m_2 be matched with f_1 and f_2 matched with m_1. Is such a match stable?

- For a match between m_i and f_j, let the share of gains from the match for m_i be V_{ij} and the share of f_j is by residual $U_{ij} = G_{ij} - V_{ij}$.

- In order for there to be no rematching (i.e. current matches to be stable), we must have the following two conditions:

$$V_{21} + U_{12} \geq G_{22} \tag{7}$$

$$V_{12} + U_{21} = G_{12} - U_{12} + G_{21} - V_{21} \geq G_{11} \tag{8}$$

- Adding the two equations, we get:

$$G_{12} + G_{21} \geq G_{22} + G_{11}$$

which violates Assumption (3). That is, negative assortative matching is not stable.

- We can show that there are V_{11} and V_{22} such that positive assortative matching is stable.

3.1 Examples

Example 1: Positive externalities in the household

Let the output produced by a household of m_i and f_j be $m_i f_j$. The production function satisfies Assumption 3.

Example 2: Specialization in the household

Assume that only one spouse is in the labor force and the other spouse engage in household activity. All individuals are equally skilled in household production but the output of a household of m_i and f_j is:

$$\text{max}[m_i, f_j]$$

Note that Assumption 3 fails in this case.

4 Non-transferable utilities

The models in the previous sections assume that marital output is perfectly divisible between a married couple. We will now look a marriage market model without matching but marital output is not divisible between a marital couple.

Let there be M men and F women. The utilities of being single are as in the earlier model without matching. Let the marital output of a marriage between any man and any woman be Z. Here, we assume that each spouse will consume Z in marriage. So the marital output is a local public good in marriage.

In this case, all men with values of being unmarried, s_m, less than Z will want to marry. Let the number of men who want to marry be μ_m. All women with values of being unmarried, S_f, less than Z will also want to marry. Let the number of women who want to marry be μ_f. If μ_m is not equal to μ_f, not everybody who wants to marry will be able to marry. The maximum number of marriages, which we will assume is equal to the actual number of marriages will be

$$\min[\mu_f, \mu_m]$$

Without loss of generality, assume that $\mu_f < \mu_m$. Then all the women who want to marry will marry. $\mu_m - \mu_f$ men will want to marry but be unable to. They will have to remain unmarried and receive their utilities from being single which will be less than Z. Each married individual will receive Z.

Who are the men who want to marry but have to remain unmarried? This question cannot be addressed in our simple setup. But when there are individuals rationed out of marriage, they will try to attract spouses by giving them additional resources in marriage. To the extent that such diversion of resources in a marriage is feasible, we return to marriage models with divisible output. If transfers are infeasible, individuals will try in invest in themselves to make themselves more attractive in the marriage market.

4.1 Non-transferable utilities and assortative matching

Let $G(m, f)$ be the output of marriage with a man of skill m and a woman of skill f. $\frac{\partial G}{\partial m} > 0$ and $\frac{\partial G}{\partial m} > 0$. Marital output is a public good for the two spouses.

Given such a marital production function, each man will want to marry the highest ability woman who is willing to marry him and vice versa. Only positive assortative matches are stable. A man of lower ability will not be able to persuade a woman who is matched with a higher ability man to leave her current match to form a new match with him. Similarly, a woman of lower ability will not be able to persuade a man who is matched with a higher ability woman to leave his current match to form a new match with her.

5 Pre-Marital Investments

The difference between transferable utility models of the marriage market and their non-transferable counterparts can be exaggerated.

When individuals care about the attributes of their spouses, there is an incentive for individuals to invest in themselves to make themselves more attractive in the marriage market. In a non-transferable utility model of the marriage market, these pre-marital investments play a similar role as transfers in a transferable utility model.

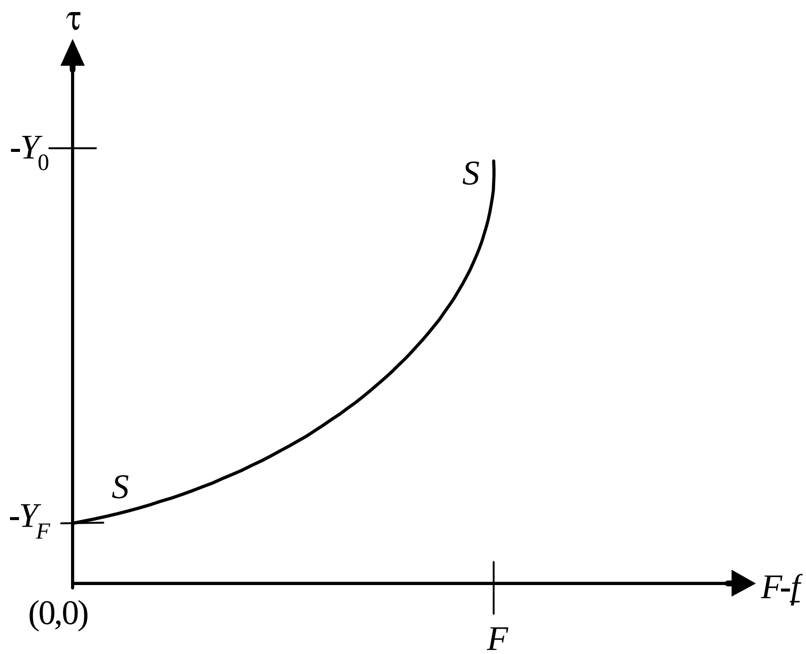

Figure 1: Supply of women to marriage market.

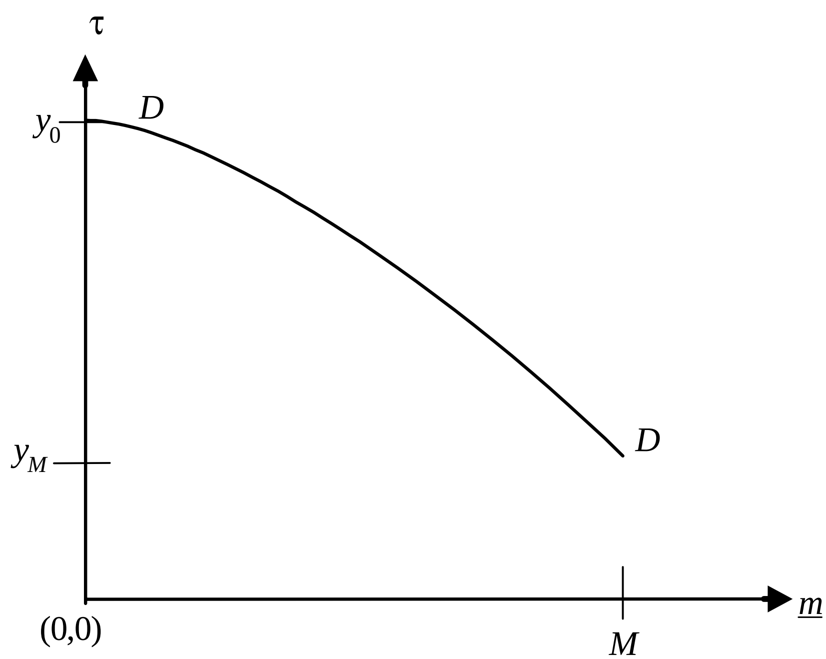

Figure 2: Demand of men in marriage market

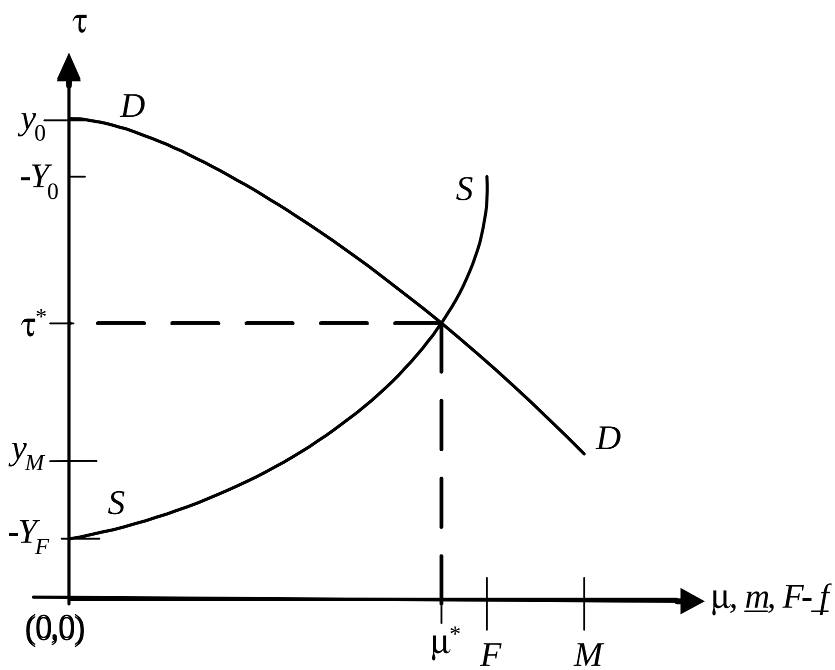

Figure 3: Equilibrium in marriage market.

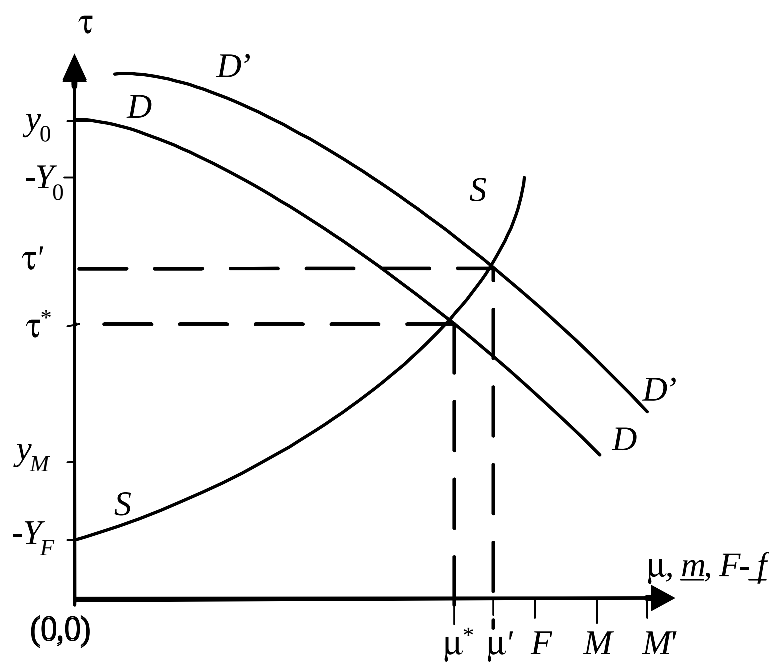

Figure 4: An increase in the number of available men.