Social Effects in Marriage Markets: Externalities in Spousal Search

Author: Scott Drewianka

Presentation by Effrosyni Adamopoulou

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Main Idea

- Investigate the hypothesis that individuals are less willing to marry when there are more potential partners to search amongst, and thus when others are also less prone to marry.
- Develop a reduced form method [variation on Manski's (1993) model] that allows identification of such spillovers on two-sided matching markets.

Types of Social Effects

1. **True** social effects $\longrightarrow$ specific interpersonal interaction, e.g. role model
2. **Quasi**-social effects $\longrightarrow$ no direct interaction, mitigated by some sort of market

A Quasi-Social Force in Matching Markets

- **Suppose that the percentage of unmatched population increases, then...**

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1. $\Rightarrow \uparrow$ opp. cost of forming a particular match$\Rightarrow$ individuals become more selective
2. $\Rightarrow$ **faster flow of potential partners**$\Rightarrow \uparrow \Pr($**at least one of them will be able to exceed any given set of standards**$)$

Manski's Reflection Problem

$$y = \alpha + z'\eta + \beta E\left[y \mid x\right] + E\left[z \mid x\right]' \gamma + u$$

$$\text{with } E\left[u \mid x, z\right] = x'\delta$$

- $\beta \rightarrow$endogenous effect$\rightarrow$social multiplier
- $\gamma \rightarrow$contextual effect
- $\delta \rightarrow$correlated effect

Manski's Reflection Problem

$$y = \alpha + z'\eta + \beta E\left[y \mid x\right] + E\left[z \mid x\right]' \gamma + u \tag{1}$$

$$\text{with } E\left[u \mid x, z\right] = x'\delta$$

Taking expectations

$$(1-\beta)E\left[y \mid x\right] = \alpha + E\left[z \mid x\right]' (\gamma + \eta) + x'\delta \tag{2}$$

Equation (1) is equivalent to

$$E\left[y \mid x, z\right] = z'\eta + (1-\beta)^{-1}\left\{\alpha + E\left[z \mid x\right]' (\gamma + \beta\eta) + x'\delta\right\}$$

- unable to identify any parameter except η
- $\Rightarrow$ need additional assumptions for γ or δ

Identifying Social Effects in Two-Sided Matching Markets

Flow of matches (marriage rate)

- Relative sizes of the two sides of the market⇒ extra restriction to Manski's (1993) model⇒ resolves the identification problem
- Two types of agents $g = m, f$
- G members of type g (M members of type m, F members of type f)
- Fraction of the market belonging to group $g = \frac{G}{M+F}$

$$y_g = \alpha_g + \widetilde{z}_g' \eta_g + \beta_g \underbrace{E\left[\mathbf{y} \mid x\right]}_{\neq E[\mathbf{y}_g|x]} + E\left[z \mid x\right]' \gamma_g + x'\delta_g + \widetilde{u}_g \qquad (3)$$

$$\text{with } \widetilde{z}_g \equiv z_g - E\left[z_g \mid x\right] \text{ and } \widetilde{u}_g \equiv u_g - E\left[u_g \mid x, z\right]$$

- Note that

$$y = 2\frac{\#\text{ of matches}}{M+F} = 2y_g r_g$$

$$E\left[y_g \mid x, z_g\right] = \widetilde{z}_g'\eta_g + \left(1 - 2\beta_g \mathbf{r}_g\right)^{-1}\left\{\alpha_g + E\left[z \mid x\right]'\gamma_g + x'\delta_g\right\} \tag{4}$$

- r_g varies across markets$\Rightarrow$ β_g can be identified
- Extension: stock of unmatched agents rather than the flow of matches

Data

- 5% Public Use Microsample of the 1980 United States Census of Population and Housing
- Men and women aged 16-44 who had never been married as of one year before the 1980 Census
- Link each individual with its state of residence and with a county group within the state
    - County group: 1,154 Census Bureau-designated geographic areas of at least 100,000 occupants

Variables

TABLE 1.—INDIVIDUAL AND COUNTY GROUP SUMMARY STATISTICS

Variable	Men		Women	
	Mean	Std Dev	Mean	Std Dev
Individual Variables				
Married (=1 if married)	0.0792	0.2700	0.0975	0.2966
Age 16	0.0948	0.2930	0.1100	0.3129
Age 17	0.0957	0.2942	0.1089	0.3115
Age 18	0.0940	0.2918	0.1067	0.3087
Age 19	0.0950	0.2933	0.1044	0.3057
Age 20	0.0883	0.2837	0.0919	0.2889
Age 21	0.0797	0.2708	0.0797	0.2709
Age 22	0.0723	0.2589	0.0673	0.2506
Age 23	0.0621	0.2413	0.0559	0.2297
Age 24	0.0533	0.2246	0.0458	0.2091
Age 26	0.0363	0.1869	0.0302	0.1710
Age 27	0.0305	0.1720	0.0250	0.1560
Age 28	0.0246	0.1549	0.0201	0.1403
Age 29	0.0213	0.1442	0.0179	0.1325
Age 30	0.0175	0.1312	0.0150	0.1214
Age 31	0.0144	0.1191	0.0124	0.1105
Age 32	0.0123	0.1104	0.0110	0.1045
Age 33	0.0109	0.1036	0.0096	0.0974
Age 34	0.0078	0.0880	0.0070	0.0836
Age 35	0.0070	0.0832	0.0065	0.0801
Age 36	0.0060	0.0773	0.0059	0.0767
Age 37	0.0055	0.0741	0.0056	0.0748
Age 38	0.0046	0.0675	0.0045	0.0670
Age 39	0.0044	0.0662	0.0043	0.0652
Age 40	0.0041	0.0636	0.0040	0.0634
Age 41	0.0035	0.0589	0.0037	0.0605
Age 42	0.0034	0.0580	0.0034	0.0582
Age 43	0.0031	0.0552	0.0032	0.0562
Age 44	0.0031	0.0553	0.0031	0.0552
Asian	0.0199	0.1397	0.0192	0.1374
Black	0.1343	0.3410	0.1684	0.3742
Latin	0.0683	0.2522	0.0662	0.2486
Native American	0.0073	0.0851	0.0074	0.0855
In school	0.4099	0.4918	0.4566	0.4981
Education (years)	12.5407	2.6936	12.6432	2.5367
Post-HS educ. (years)	1.1719	1.8422	1.1847	1.7618
Post-coll. educ. (years)	0.1314	0.5853	0.1039	0.4931
Completed HS (1 if yes)	0.6338	0.4818	0.6481	0.4776
Started college (1 if yes)	0.3897	0.4877	0.4180	0.4932
Completed college (1 if yes)	0.1177	0.3223	0.1156	0.3197
Post-coll. educ. (1 if yes)	0.0616	0.2405	0.0554	0.2288
Log unearned income	1.4449	2.6787	1.2479	2.4865
Log wage	1.3889	0.7061	1.2601	0.6438
Wage predicted (1 if yes)	0.2032	0.4024	0.2738	0.4459
Sample size	1,105,669		923,986	
County Group Variables				
Average log rent	5.5652	0.1956		
Marital log rent gradient	5.0053	0.4228		
Log population density	4.6047	1.9639		
% of singles who are men	0.5239	0.0370		
% single	0.4208	0.0710		
Sample size	1,154			

Results

TABLE 2.—ESTIMATED ELASTICITY OF MARRIAGE WITH RESPECT TO FRACTION SINGLE

Group	Sex	States?	Est. Elast.	Std. Error	*P*	% Homogamy
Baseline: OLS Estimates with Uncorrected Standard Errors						
All	Men	No	−1.515	0.083	0.0001	
		Yes	−1.304	0.095	0.0001	
	Women	No	−1.435	0.081	0.0001	
		Yes	−1.231	0.092	0.0001	
GMM Estimates with Corrected Standard Errors						
All	Men	No	−0.994	0.005	0.0001	
		Yes	−0.996	0.006	0.0001	
	Women	No	−0.701	0.003	0.0001	
		Yes	−0.699	0.003	0.0001	
GMM Estimates by Race/Ethnicity						
Asian	Men	No	−1.085	0.655	0.0976	66
		Yes	−1.101	0.597	0.0649	
	Women	No	−0.600	0.293	0.0409	56
		Yes	−0.591	0.331	0.0743	
Black	Men	No	−1.035	0.093	0.0001	88
		Yes	−1.034	0.047	0.0001	
	Women	No	−1.046	3.104	0.7362	96
		Yes	−1.057	1.661	0.5245	
Latino	Men	No	−0.817	0.243	0.0008	67
		Yes	−0.819	0.350	0.0194	
	Women	No	−0.599	0.117	0.0001	72
		Yes	−0.598	0.278	0.0313	
Native American	Men	No	−0.891	0.533	0.0945	38
		Yes	−0.861	0.597	0.1489	
	Women	No	−0.638	2.134	0.7648	37
		Yes	−0.636	1.735	0.7140	
Nat. Am. w/white reference	Men	No	−0.900	0.191	0.0001	54
		Yes	−0.903	0.373	0.0155	
	Women	No	−0.578	0.383	0.1318	52
		Yes	−0.583	0.110	0.0001	
White	Men	No	−0.828	0.007	0.0001	96
		Yes	−0.833	0.007	0.0001	
	Women	No	−0.532	0.003	0.0001	95
		Yes	−0.533	0.003	0.0001	

Nature of the Effect

FIGURE 1.—A DISTINCTIVE FEATURE OF (QUASI-)SOCIAL EFFECTS THAT WORK THROUGH THE NUMBER OF PARTNERS ENCOUNTERED

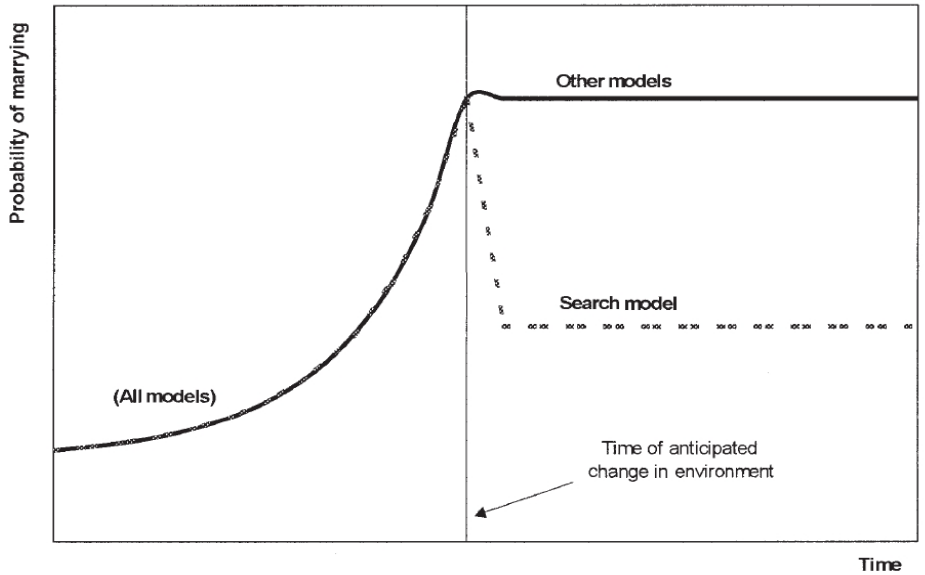
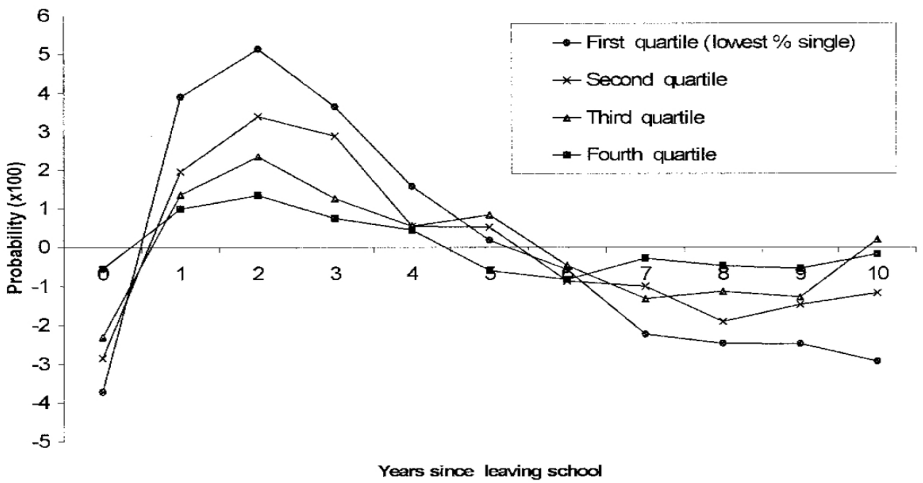


FIGURE 2.—RESIDUAL PROBABILITY OF MARRIAGE, BY YEARS SINCE LEAVING SCHOOL AND QUARTILE OF COUNTY-GROUP FRACTION SINGLE



Quartile series are de-meaned.

Conclusions

- A 10% increase in the fraction of the population that is unmarried causes the marriage rate of never married men to fall by 10%, and that of never married women to fall by 7%
- The empirical method developed, in spite of its success in this paper, will not always generate clear evidence, e.g. if the estimation gives a disperse set of estimates
- This paper identifies a feedback mechanism that magnifies underlying changes in the desire to marry. However, the sourse of those underlying changes is not identified.