Marriage Markets on the Campus: University Education and Assortative Mating in Germany

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IZA Bonn & ZEW Mannheim

8. Mikrozensus Nutzerkonferenz – November 11, 2014
Introduction

Motivation

- inequality (again) on top of policy agendas
- marriage and socio-economic inequality closely related
- increasing educational attainment and assortative mating
Introduction

Motivation

▶ inequality (again) on top of policy agendas
▶ marriage and socio-economic inequality closely related
▶ increasing educational attainment and assortative mating

This paper

▶ marriage market outcomes of German university graduates
▶ estimate effect on educational homogamy
▶ variation in student gender composition
Previous literature

Gender composition by group

- region
- ethnic groups
- educational level
- socio-economic status
Previous literature

Gender composition by group

- region
- ethnic groups
- educational level
- socio-economic status

Outcomes

- marriage and fertility (Bitler/Schmidt, AER PP 2012)
- social mobility (Edlund, JPE 1999, Abramitzky et al., AEJ 2011)
- bargaining power (Chiappori et al., JPE 2002)
- labor supply (Angrist, QJE 2002)
Stylized model

- marriage market subdivided into groups $j \in \{1, \ldots, J\}$
  - group size $N^j = N_f^j + N_m^j$
  - strict preferences for intra-group marriage
  - no frictions, no heterogeneity
Framework

Stylized model

- marriage market subdivided into groups $j \in \{1, \ldots, J\}$
  - group size $N^j = N^j_f + N^j_m$
  - strict preferences for intra-group marriage
  - no frictions, no heterogeneity
- probability of intra-group marriage
  - determined by gender composition: $\alpha^j_s = \frac{N^j_s}{N^j}$ for $s \in \{f, m\}$

$$
\Pi^j_s(\alpha^j_s) = \min \left\{ \frac{N^j_s, N^j - N^j_s}{N^j_s} \right\} = \begin{cases} 
1 & \text{if } \alpha^j_s \leq 0.5 \\
(1/\alpha^j_s) - 1 & \text{if } \alpha^j_s > 0.5 
\end{cases}
$$
Framework

Probability of intra-group marriage

Probability of intra-group marriage
Probability of intra-group marriage

Framework

Probability of intra-group marriage
Educational system as marriage market


- stepwise selection into higher education
- increasingly homogeneous groups with increasing age
- marriage typically after completion of education
- partner preferences: similar education and age
Educational system as marriage market


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- marriage typically after completion of education
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Likelihood of educational homogamy

- increases with decreasing own-sex share (and vice versa)
- key indicator: gender composition of students within field
Data

**German Microcensus 2003–2010**

- marital status and educational degree
- field of study and graduation year
Data

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**German Statistical Yearbooks**
- total number of students by gender and 51 fields
- period 1952–2012 (winter terms)
Data

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**German Statistical Yearbooks**
- total number of students by gender and 51 fields
- period 1952–2012 (winter terms)

**Sample**
- married individuals aged 30–45
- university degree (before 30)
- German nationality from West Germany
Marriage markets on the campus?

Gender composition of university students

Source: Statistical Yearbooks 1952-2012, own calculations.
Marriage markets on the campus?

Source: Statistical Yearbooks 1952-2012, own calculations.
Marriage markets on the campus?

University education among couples

Marriage markets on the campus?

Age at completion of education and marriage

Marriage markets on the campus?

Distribution of gender composition

Married couples aged 30-45.
Marriage markets on the campus?

Probability of same-field partner

Empirical estimation

Regression model

\[ Y_{icfty} = \alpha + S'_{ft-5} \beta + X'_{ft-5} \gamma + \delta_{cy} + \delta_{s} + \varepsilon_{icfty} \]

- \(i\): individual, \(c\): 5-year-cohorts, \(t\): graduation year, \(f\): field of study, \(y\): survey year, \(s\): state

- \(Y\): partner with degree in same field (0/1)
- \(S\): own-sex share in field of study minus 50% \([-0.5; 0.5]\)
- \(X\): number of students in field, field group fixed effects (6)
- \(\delta_{cy}\): 5-year-cohort \(\times\) year fixed effects (32)
- \(\delta_s\): state fixed effects (11)
<table>
<thead>
<tr>
<th>Gender</th>
<th>Variable</th>
<th>Men</th>
<th></th>
<th>Women</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Gender</td>
<td>Mean</td>
<td>Sd</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>Partner univ. degree</td>
<td>0.48</td>
<td>0.5</td>
<td>0</td>
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<td></td>
<td>Partner same field</td>
<td>0.15</td>
<td>0.36</td>
<td>0</td>
<td>1</td>
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<tr>
<td></td>
<td>Own share</td>
<td>0.23</td>
<td>0.2</td>
<td>-0.39</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>39.25</td>
<td>3.87</td>
<td>30</td>
<td>45</td>
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<tr>
<td></td>
<td>Age (partner)</td>
<td>37.6</td>
<td>4.04</td>
<td>30</td>
<td>45</td>
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<tr>
<td></td>
<td>Age at marriage</td>
<td>29.81</td>
<td>4.22</td>
<td>17</td>
<td>45</td>
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<tr>
<td></td>
<td>Age at graduation</td>
<td>26.36</td>
<td>2.02</td>
<td>20</td>
<td>29</td>
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<td>Hours worked</td>
<td>43</td>
<td>10.22</td>
<td>0</td>
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<td>Employed</td>
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<td>No. of observations</td>
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## Results – Main Effect

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Men</th>
<th></th>
<th></th>
<th>Women</th>
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<tbody>
<tr>
<td>Same field (0/1)</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td>Own share</td>
<td>-0.501*** (0.052)</td>
<td>-0.328*** (0.071)</td>
<td>-0.309*** (0.073)</td>
<td>-0.456*** (0.041)</td>
<td>-0.458*** (0.051)</td>
<td>-0.456*** (0.055)</td>
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<tr>
<td>Field controls</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cohort x Year FE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>State FE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>20518</td>
<td>20518</td>
<td>20518</td>
<td>14536</td>
<td>14536</td>
<td>14536</td>
</tr>
<tr>
<td>R2</td>
<td>0.077</td>
<td>0.087</td>
<td>0.089</td>
<td>0.043</td>
<td>0.054</td>
<td>0.058</td>
</tr>
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</table>

*Note: Standard errors (in parentheses) clustered at field level. Significance levels: 0.1 (*), 0.05 (**), and 0.01 (***)*.
## Results – Non-linear Effects

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Men</th>
<th>Women</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
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<tr>
<td><strong>Same field (0/1)</strong></td>
<td></td>
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</tr>
<tr>
<td>Own share</td>
<td>-0.688** (0.318)</td>
<td>-1.859** (0.817)</td>
</tr>
<tr>
<td>Own share × (share &gt; 0)</td>
<td>0.285 (0.320)</td>
<td>1.521* (0.820)</td>
</tr>
<tr>
<td>Own share^2</td>
<td>-3.655* (2.049)</td>
<td></td>
</tr>
<tr>
<td>Own share^2 × (share &gt; 0)</td>
<td>3.486 (2.095)</td>
<td></td>
</tr>
<tr>
<td>Own share [-0.5; -0.2]</td>
<td></td>
<td>0.150*** (0.047)</td>
</tr>
<tr>
<td>Own share [-0.2; -0.1]</td>
<td></td>
<td>0.100** (0.047)</td>
</tr>
<tr>
<td>Own share [0.1; 0.2]</td>
<td></td>
<td>-0.006 (0.020)</td>
</tr>
<tr>
<td>Own share [0.2; 0.5]</td>
<td></td>
<td>-0.094*** (0.020)</td>
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<tr>
<td>Field controls</td>
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<tr>
<td>Cohort × Year FE</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>State FE</td>
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<td>Yes</td>
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<tr>
<td>N</td>
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<td>R2</td>
<td>0.092</td>
<td>0.093</td>
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## Results – Effect Heterogeneity

<table>
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<th></th>
<th>Women</th>
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<td>(3)</td>
<td></td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td>Own share</td>
<td>-0.039</td>
<td>-0.308***</td>
<td>-0.334***</td>
<td></td>
<td>-0.564***</td>
<td>-0.467***</td>
<td>-0.412***</td>
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<tr>
<td>Own share × Humanities</td>
<td>-0.723**</td>
<td>0.248</td>
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<tr>
<td>Own share × Natural Sc.</td>
<td>-0.240</td>
<td>0.169</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Own share × Medical Sc.</td>
<td>-0.339*</td>
<td>0.169</td>
<td>-0.354</td>
<td></td>
<td></td>
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<tr>
<td>Own share × Engineering</td>
<td>-0.338**</td>
<td>0.100</td>
<td>0.687</td>
<td></td>
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<td></td>
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<tr>
<td>Own share × Arts</td>
<td>1.077***</td>
<td>0.253**</td>
<td>0.389***</td>
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<td></td>
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<tr>
<td>Own share × (&gt;75K stud.)</td>
<td></td>
<td>0.109*</td>
<td>-0.072</td>
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<tr>
<td>Own share × (high income)</td>
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Conclusions

Summary

- educational system important marriage market for high-skilled
- negative effect of own-sex share on within-field marriage
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Implications

- contribution to polarization of household earnings?
- effects on fertility and intergenerational mobility?
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- negative effect of own-sex share on within-field marriage

Implications

- contribution to polarization of household earnings?
- effects on fertility and intergenerational mobility?

Next steps

- long-term outcomes: fertility, labor supply, marriage stability
- explicit link to household income inequality
Thank you for your attention!

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Appendix: Non-parametric Effect

![Graph showing the probability of partner being in the same field vs. own share for men and women. The graph includes lines for different ranges of own share and 95% confidence intervals.](image-url)