Organizational Publication Output and Job-Placement and Individual Output of Doctorate Holders

Paris, September 2017
Jakob Tesch
Academic Prestige & Careers

1. To what extent do academic prestige and its components have an impact on careers of PhD holders?
   a) What’s the specific role of the PhD-granting faculty’s publications and citation impact for faculty’s prestige and career outcomes of their graduates?

2. What is academic prestige?
   Today: first results on effect of PhD-granting faculty’s scientific performance on job-placement after the PhD
Academic Prestige

- .. is a form of symbolic capital, ascribed, highly subjective but increasingly “objectified” through rankings etc.

Publications

Grants

Social Capital

Visibility in community

Positions in academic associations, committees, boards etc.

Prestige

Career Outcomes
Academic Prestige

- .. is a form of symbolic capital, highly subjective but increasingly “objectified” through rankings etc.

- Publications
- Grants
- Social Capital
- Prestige
- Career Outcomes
- Visibility in community
- Positions in academic associations, committees, boards etc.
Prestige and Academic Careers

• Department prestige affects placement of PhD graduates (Burris 2014, Headworth & Freese 2016)

• Power distribution between number of professors and number of PhD-departments that these professors graduated from (large share of professors comes from few (elite) departments)

• Limited evidence in Germany

  PhD networks (Münch 2014), Academic performance (Wollersheim et al. 2015), Tenure in Economics (Graber et al. 2008)
Effects of Prestige on Academic Careers

• Prestige effects
  – Selection effects
  – Training Effects
  – Prestige effects

• $H_1$ the higher the productivity of the faculty the more should graduates from these faculties be active in publishing themselves

• $H_2$ Graduates from prestigious faculties show better career outcomes, “prestige premium”
Data & Methods
The German Doctoral Candidates and Doctorate Holders Study *ProFile*

**Q during doctoral candidacy**


**Yearly survey**


**Q at final exam of the doctorate**

- If indicated completion of doctorate

**Job placement**

- A few years after graduation
  - 2015, 2016, 2017


www.risis.eu

>5,000 graduates until 2016

>15,000

>2,450

Panel

Cohort

STI 2017 | 8
CWTS Leiden Ranking

- Collects publications and citations from Web of Science database, range of indicators available
- Author affiliation as basis for allocation to universities
- Algorithm for classifying journal articles to scientific fields

- RISIS site visit: data for 2008-2015 for subset of German (doctoral degree granting) universities from LR
ProFile and Leiden Ranking

Match (Uni, Main Field, Year of graduation)

• 5 Main Fields (SSH, BioMed+H, Life&Earth S., Math +Comp S.)
• 78 universities, 187 Main fields at German universities (=level1 groups)
• 383 – 1 respondents per level1 groups
• Not matched: 63 doctorate holders from arts universities
• Year of graduation matched to end of observation period in LR
Matching with Leiden - Disciplines

**Discipline of PhD (ProFile)**
(Examples, based on open ends)

- Mathematics
- Computer Science
- Physics, Astronomy
- Chemistry
- Earth Sciences (excluding Geography)
- Geography
- Biology
- Pharmacy
- Civil Engineering
- Electrical Engineering
- Mechanical and Process Engineering
- Engineering in general
- Mining, Metallurgy

**Main Scientific Fields (Leiden)**
(based on Publications)

- Biomedical and health sciences
- Life and earth sciences
- Mathematics and computer science
- Physical sciences and engineering
- Social sciences and humanities

DZH. RISIS
Measures

Dependent Variables
Number of publications authored since beginning of the PhD (training)

Working in Academic R&D vs. Not working in Academic R&D (prestige)

Researchers vs. Non-Researchers (prestige)
Measures - Independent Variables

from Leiden Ranking
• total number of citations (visibility)
• fractional proportion of articles in top ten highly cited publications (impact)

from ProFile
• gender
• the time elapsed between graduation and participation in the Follow-up survey
• career preferences for research (assessed at graduation)
Results
Job Placement of Doctorate Holders

- Academic R&D: 56.0%
- Non-academic R&D: 8.4%
- Non R&D: 31.6%
- Currently not working: 4.1%
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual Level (ProFile)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job-placement in academic R&amp;D</td>
<td>.561</td>
<td>.496</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Researchers</td>
<td>.642</td>
<td>.479</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Number of publications</td>
<td>14.05</td>
<td>18.38</td>
<td>1</td>
<td>275</td>
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<tr>
<td>Career preferences for research</td>
<td>1.05</td>
<td>1.02</td>
<td>-2.43</td>
<td>3.57</td>
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<tr>
<td>Gender (Women=1)</td>
<td>.492</td>
<td>.500</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Time between graduation and survey (in months)</td>
<td>43.00</td>
<td>22.27</td>
<td>1</td>
<td>130</td>
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<tr>
<td><strong>Organizational Level (Leiden)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of citations</td>
<td>2999.43</td>
<td>4826.98</td>
<td>1</td>
<td>58400</td>
</tr>
<tr>
<td>Proportion of articles in top ten highly cited articles</td>
<td>.114</td>
<td>.035</td>
<td>0</td>
<td>.36</td>
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</tbody>
</table>
# Results of Multi-Level Models

<table>
<thead>
<tr>
<th></th>
<th>Job-placement in academic R&amp;D (logit, MFX)</th>
<th>Researchers (logit, MFX)</th>
<th>Number of publications (GLS, MFX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career preferences for research</td>
<td>.95*** (.05)</td>
<td>1.04*** (.05)</td>
<td>.08*** (.03)</td>
</tr>
<tr>
<td>Gender (Women=1)</td>
<td>-.09 (.09)</td>
<td>-.28*** (.09)</td>
<td>-.27*** (.05)</td>
</tr>
<tr>
<td>Time between graduation and survey</td>
<td>-.00** (.00)</td>
<td>-.00** (.00)</td>
<td>.01*** (.00)</td>
</tr>
<tr>
<td>Total number of Citations</td>
<td>.00 (.00)</td>
<td>.00 (.00)</td>
<td>.00** (.00)</td>
</tr>
<tr>
<td>Proportion of articles in top ten highly cited articles</td>
<td>.23 (1.31)</td>
<td>3.31** (1.39)</td>
<td>-.33 (.69)</td>
</tr>
<tr>
<td>Rho (ICC)</td>
<td>.00</td>
<td>.00</td>
<td>.02</td>
</tr>
<tr>
<td>N (level 1)</td>
<td>187</td>
<td>187</td>
<td>163</td>
</tr>
<tr>
<td>N (level 2)</td>
<td>2,450</td>
<td>2,450</td>
<td>1,440</td>
</tr>
</tbody>
</table>

N= 2,450 for full sample and 1,440 for number of publications (researchers only)
Conclusion & next steps

- Effects in the direction expected but
- intra-class correlation is close to zero suggesting that group setup can be improved

Next steps

- Include other rankings and more components of prestige
- Improve coding of scientific fields for Leiden
Thank you for your attention!