Tracking Matriculation, Attrition, and Time to Degree in Economics Ph.D. Programs

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Background

• Post-1996:
• ↓ economics Ph.D. students in the pipeline
• ↑ economics faculty reaching retirement age
• »» growing scarcity of new Ph.D. economists
  • evidenced by stark ↑ starting salaries
    – (with resulting compression issues)
• Are Supply Responses Likely?
Background

• My work in this area:
  • Studies of:
    • Labor market outcomes:
      • Employment, salary, job conditions
    • Matriculation
    • Attrition
    • Time to degree
Research Questions

1. Matriculation

Why do potential economists not enroll in Ph.D. programs in economics?

What do they do instead?
2. Attrition/Retention

How many dropout?

Why? When? Can it be predicted?
Research Questions

3. Time To Degree

Why do some take longer?

Time spent at each stage of process?

Which characteristics affect time-to-degree?
Research Goals

Examine program, applicant, enrollee, dropout, & time-to-degree characteristics in economics Ph.D. programs

- Representative by quality tier
- Capture large share of Ph.D. production
- Manageable number for long-term study
Research Design

Data

- Program characteristics (P-baseline)
- Applicant characteristics (P-baseline)
- Enrollee characteristics (P-baseline)
- Enrollee progress (P-yearly)
- Dropout surveys (S-yearly)
- Completer surveys (S-yearly)

P = program survey; S = student survey
Research Design

Considerations

• Data availability
  • Program Cooperation
  • Survey Response Rates
  • Is Nonresponse Bias Measurable?

• Comparison Groups and Comparable Data
  • Nonmatriculants v. Matriculants
  • Dropouts v. Continuing Students
  • Fast Completers v. Slower Completers
Matriculation: Getting Students to Enroll

What is underlying population?

- Undergraduate Majors?
  - Too numerous and broad

- All Ph.D. program applicants?
  - Qualifications
  - Recordkeeping by programs

- Our focus: All accepted applicants to Ph.D. programs
Matriculation:  
Getting Students to Enroll

• Findings:
  • Among those accepted, VERY few do not enroll (<12%)
  • Good news: few numerical losses after admission
  • Challenge: interest more top undergraduate majors in applying to Ph.D. programs
Attrition/Retention

• How many dropout?

• Why? When? Can it be predicted?
Attrition/Retention

• Estimate dropout rates
  586 entering students of 27 Ph.D. programs
  » 77 drops by start of 2\textsuperscript{nd} year
  » 78 more drops by start of 3\textsuperscript{rd} year
  » $\approx 26\%$ dropout in first 2 years

• Relate student & program characteristics to attrition

• Assess reasons for dropout
Attrition/Retention

Data

• Program Characteristics
  • From DGS at 27 Ph.D. programs

• Student Characteristics
  • Baseline Data from Ph.D. programs

• Annual Follow-up with Ph.D. programs
Attrition/Retention

Data

- Student Characteristics
- Baseline Data from Ph.D. programs
- Annual Follow-up with Ph.D. programs
Attrition/Retention

Table 1 - Ph.D. Program Characteristics and Attrition Rates by Program Rank

<table>
<thead>
<tr>
<th></th>
<th>1-6</th>
<th>7-15</th>
<th>16-30</th>
<th>31-48</th>
<th>&gt;48</th>
<th>Full sample</th>
<th>Two-year attrition rate by row variable</th>
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</thead>
<tbody>
<tr>
<td>Number of programs</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>27</td>
<td>-</td>
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<tr>
<td>Number of students</td>
<td>103</td>
<td>149</td>
<td>142</td>
<td>128</td>
<td>64</td>
<td>586</td>
<td>-</td>
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<tr>
<td>Number of dropouts</td>
<td>15</td>
<td>27</td>
<td>42</td>
<td>50</td>
<td>21</td>
<td>155</td>
<td>-</td>
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<tr>
<td>First-year attrition rate</td>
<td>0.04</td>
<td>0.13</td>
<td>0.07</td>
<td>0.23</td>
<td>0.23</td>
<td>0.13</td>
<td>-</td>
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<tr>
<td>Second-year attrition rate</td>
<td>0.11</td>
<td>0.06</td>
<td>0.24</td>
<td>0.20</td>
<td>0.13</td>
<td>0.15</td>
<td>-</td>
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<tr>
<td>Two-year attrition rate</td>
<td>0.15</td>
<td>0.18</td>
<td>0.30</td>
<td>0.39</td>
<td>0.33</td>
<td>0.26</td>
<td>-</td>
</tr>
<tr>
<td>First-year class size (# of students)</td>
<td>37</td>
<td>27</td>
<td>22</td>
<td>25</td>
<td>18</td>
<td>26</td>
<td>0.29</td>
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<tr>
<td>Faculty-student ratio</td>
<td>0.20</td>
<td>0.29</td>
<td>0.29</td>
<td>0.26</td>
<td>0.32</td>
<td>0.27</td>
<td>0.30</td>
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<tr>
<td>Private university</td>
<td>1.00</td>
<td>0.25</td>
<td>0.36</td>
<td>0.20</td>
<td>0.55</td>
<td>0.43</td>
<td>0.20</td>
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<tr>
<td>Terminal master's degree offered</td>
<td>0.00</td>
<td>0.14</td>
<td>0.17</td>
<td>0.16</td>
<td>0.41</td>
<td>0.16</td>
<td>0.29</td>
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<tr>
<td>Seminar attendance required</td>
<td>0.23</td>
<td>0.58</td>
<td>0.45</td>
<td>0.84</td>
<td>0.89</td>
<td>0.58</td>
<td>0.29</td>
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<tr>
<td>Core exam pass required</td>
<td>0.77</td>
<td>0.62</td>
<td>0.58</td>
<td>0.73</td>
<td>0.38</td>
<td>0.63</td>
<td>0.27</td>
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<tr>
<td>Shared offices available</td>
<td>0.54</td>
<td>1.00</td>
<td>0.83</td>
<td>1.00</td>
<td>0.45</td>
<td>0.82</td>
<td>0.26</td>
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<tr>
<td>Individual advisers assigned</td>
<td>0.31</td>
<td>0.52</td>
<td>0.35</td>
<td>0.21</td>
<td>0.00</td>
<td>0.32</td>
<td>0.25</td>
</tr>
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</table>
### Attrition/Retention

Table 2 - Student Characteristics by Ph.D. Program Rank

<table>
<thead>
<tr>
<th></th>
<th>Program Rank</th>
<th>Full sample</th>
<th>Two-year attrition rate by row variable&lt;sup&gt;4&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-6</td>
<td>7-15</td>
<td>16-30</td>
</tr>
<tr>
<td>Number of students</td>
<td>103</td>
<td>149</td>
<td>142</td>
</tr>
<tr>
<td>GRE analytical score</td>
<td>752&lt;sup&gt;c&lt;/sup&gt;</td>
<td>737</td>
<td>716</td>
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<tr>
<td>GRE verbal score</td>
<td>575</td>
<td>547</td>
<td>573</td>
</tr>
<tr>
<td>GRE quantitative score</td>
<td>785</td>
<td>782</td>
<td>765</td>
</tr>
<tr>
<td>U.S. Citizen&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.32</td>
<td>0.26</td>
<td>0.39</td>
</tr>
<tr>
<td>Male&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.72</td>
<td>0.66</td>
<td>0.67</td>
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<tr>
<td>Median age at entry to program</td>
<td>24.6</td>
<td>24.7</td>
<td>24.6</td>
</tr>
<tr>
<td>Hold prior graduate degree&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.38</td>
<td>0.48</td>
<td>0.44</td>
</tr>
<tr>
<td>Hold undergraduate degree in economics&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.73</td>
<td>0.69</td>
<td>0.78</td>
</tr>
<tr>
<td>Hold undergraduate degree in economics/math&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.10</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Hold undergraduate degree in math&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.08</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Median years since undergraduate degree</td>
<td>1.3</td>
<td>2.3</td>
<td>2.2</td>
</tr>
</tbody>
</table>
## Attrition/Retention

Table 2 - Student Characteristics by Ph.D. Program Rank

<table>
<thead>
<tr>
<th>Type of Undergraduate Institution Attended</th>
<th>Program Rank</th>
<th>Full sample</th>
<th>Two-year attrition rate by row variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-6</td>
<td>7-15</td>
<td>16-30</td>
</tr>
<tr>
<td>U.S. economics Ph.D.-granting</td>
<td>0.33</td>
<td>0.21</td>
<td>0.24</td>
</tr>
<tr>
<td>U.S. top-50 liberal arts</td>
<td>0.08</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Other U.S. public</td>
<td>0.02</td>
<td>0.01</td>
<td>0.06</td>
</tr>
<tr>
<td>Other U.S. private</td>
<td>0.00</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Top-50 foreign</td>
<td>0.13</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Other foreign</td>
<td>0.45</td>
<td>0.66</td>
<td>0.57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Financial Aid During First Year of Study</th>
<th>Program Rank</th>
<th>Full sample</th>
<th>Two-year attrition rate by row variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fellowship</td>
<td>0.93</td>
<td>0.56</td>
<td>0.34</td>
</tr>
<tr>
<td>Research assistantship</td>
<td>0.00</td>
<td>0.01</td>
<td>0.06</td>
</tr>
<tr>
<td>Teaching assistantship</td>
<td>0.00</td>
<td>0.23</td>
<td>0.40</td>
</tr>
<tr>
<td>No aid</td>
<td>0.07</td>
<td>0.21</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Attrition/Retention

Regression Analysis

• Probability of Dropout Lower:
  • Among students at top tier and lower programs (v. middle tiers)
  • At programs that assign shared offices to students on financial aid (integration)
  • Among those with higher verbal and quantitative GRE scores
  • Among those with research assistantships
Attrition/Retention

Data

- Dropout Characteristics
- Surveys
  - DGS (as part of yearly follow-up)
  - Dropouts
    - Response Rates:
    - 26/77 first-year (34%)
    - 31/78 second-year (40%)
Attrition/Retention

Survey Focus

• Why did they drop out?
  • Preparation
  • Program
  • Personal

• What are they doing now?
  • Other Ph.D. program
  • Other educational path
  • Other activities
Attrition/Retention

Why did they drop out?

- Unsatisfactory academic progress (59%)
  - "insufficient mathematical preparation"
  - "difficulty mastering economic theory"

- Personal and family reasons (12%)

- Lost interest in graduate study (10%)
Attrition/Retention

What are they doing now?

• Transferred to other economics Ph.D. program ≈ 1/3

• Other Education (M.A., Ph.D. other field) ≈ 1/4

• Other Career ≈ 1/4

• Unknown ≈ 1/6
Time To Degree

• Why do some take longer than others?

• How much time is spent at each stage of the process?

• What characteristics affect time-to-degree?
Time To Degree

Data Approaches

• Follow Enrollees through programs
  • time and cost issue:
    • median TTD in economics is 5.5 years
    • ranges to >25 years

• Survey Class of Completers
Time To Degree

**Data**

- Survey of completers

**Issues:**
  - Identifying population of completers
  - Finding them
  - Survey responses
Time To Degree

Other Issues

• Defining time to degree
  • Time since enrollment
  • Time since undergrad
  • Time in residence
  • Graduation date
  • Defense date
Time To Degree

• Defining Other important times in process:
  • Course Work Completion
  • Qualifying Examinations
  • ABD
  • Dissertation Writing
  • Inconsistent across programs
Conclusion

• Examining matriculation, attrition & time-to-degree involves:
  • Substantial data collection efforts
  • Long term planning
Conclusion

• Formulate specific goals:
  • What information do you think you need and why
  • What information can you reasonably obtain
  • Program/DGS cooperation essential