

Apply or Defer?

Identifying the Most Important Factors for Economics PhD Admissions

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Jan 2025

Introduction

- Few resources for prospective applicants outside of professors
 - Limited empirical studies on economics PhD admissions
 - Survey-based studies for relative importance
- Analyze profiles and results from 2007-2022
 - Unique observation of application and acceptance sets
 - Applicant approach rather than committee approach
- Key findings:
 - Estimates for predoc, NSF GRFP, math courses
 - Evidence for the GRE screening hypothesis
 - Evidence in support of application controls

Literature Review

- Theory of signaling underlies the literature (Spence, 1973)
- Graduating institution is large factor in placement (Stock, Alston, & Milkman, 2000; Jones & Sloan, 2020)
- Important factors:
 - Quantitative GRE (Attiyeh & Attiyeh, 1997; Stock & Siegfried, 2015)
 - Real analysis, linear algebra, calculus sequence (Milkman & Marjadi, 2017; Jones et al., 2020; American Economic Association, 2024)
 - Predoctoral work (Schlauch & Startz, 2018; Wei, 2022)
 - Letter length and subjective score (Bai et al., 2022)
 - Undergraduate research experience (Kartik, 2020; Grove, Dutkowsky, and Grodner, 2007)
 - Graduate economics courses are direct signals (Olszewski, 2020; Berlian, 2020)

Literature Review

- Study contribution:
 - Unique explanatory variables and controls
 - Median-rank and best-rank outcomes
 - Applicant approach

Data / Limitations

- Annual Profiles and Results page on Urch
 - Anonymous
 - Template format (see next slide)
- Limitations are very similar to survey data
 - Anonymity could lead to self-reporting bias
 - Could be selection on success

Data / Limitations

PROFILE:

Type of Undergrad:

Undergrad GPA:

Type of Grad:

Grad GPA:

GRE:

Math Courses:

Econ Courses:

Other Courses:

Letters of Recommendation:

Research Experience:

Teaching Experience:

Research Interests:

SOP:

Other:

Figure: Profile Survey
Portion

RESULTS:

Acceptances:

Waitlists:

Rejections:

Pending:

Attending:

Comments:

What would you have done differently?

Figure: Results Survey
Portion

Variables

- U.S. News & World Report 2024 rankings
 - Aligns with recent literature
- International GPAs converted using World Education Services
- 800-point quantitative scores converted to 170-point scale
- Course variable dummies
- Prior research experience dummies
- Undergraduate bins
- Sentiment analysis
- Application set controls

Notable Summary Statistics

- Sample size of 530 applicants
- Outcome and continuous variables:
 - Average median rank was 28.39
 - Average best rank was 19.46
 - Average GRE quant score was 167.69
 - Average GPA was 3.73
- Dummy variables:
 - 77% took real analysis
 - 40% worked as an RA
 - 28% worked as a predoc
 - 2% earned the support of the NSF GRFP
 - 26% were international students

Empirical Framework

- Main specification of economics PhD admissions:

$$\begin{aligned} Outcome_i = & \beta_0 + \beta_1 Quant_i + \beta_2 (Quant_i - \overline{Quant})^2 + \beta_3 GPA_i \\ & + \beta_4 \mathbb{1}_{Multivariable_i} + \beta_5 \mathbb{1}_{RealAnalysis_i} + \beta_6 \mathbb{1}_{LinearAlgebra_i} \\ & + \beta_7 \mathbb{1}_{Statistics_i} + \beta_8 \mathbb{1}_{PhDMicro_i} + \beta_9 \mathbb{1}_{ResearchAssistant_i} \\ & + \beta_{10} \mathbb{1}_{PredoctoralAssistant_i} + \beta_{11} \mathbb{1}_{SeniorThesis_i} + \beta_{12} \mathbb{1}_{NSF_i} \\ & + \beta_{13} \mathbb{1}_{Masters_i} + \beta_{14} \mathbb{1}_{Inter.English_i} + \beta_{15} \mathbb{1}_{Inter.Non-English_i} \\ & + \beta_{16} \mathbb{1}_{Inter.English_i} * \mathbb{1}_{Masters_i} + \beta_{17} \mathbb{1}_{Inter.Non-English_i} * \mathbb{1}_{Masters_i} \\ & + X_i \gamma + A_i \alpha + u_i \quad (1) \end{aligned}$$

- $Outcome_i \in \{MedRank_i, BestRank_i, AdmitT10_i, AdmitT30_i\}$
- Turning point for GRE:
 - $Quant_i = \overline{Quant} - \beta_1 / 2\beta_2$

Results: Rank Outcomes

Table: Median- and Best-rank Outcomes

	Median Rank			Best Rank		
	NC	DC	Full	NC	DC	Full
Quantitative GRE	-1.752*** (0.351)	-1.322*** (0.336)	-0.064 (0.302)	-1.127*** (0.330)	-0.794* (0.324)	0.069 (0.326)
$(\text{Quant} - \overline{\text{Quant}})^2$	0.052 (0.048)	0.070† (0.041)	0.099† (0.053)	0.096† (0.050)	0.111* (0.047)	0.137* (0.057)
GPA out of 4.0	-21.005*** (3.393)	-21.848*** (3.175)	-9.635** (2.964)	-16.379*** (2.942)	-16.807*** (2.841)	-8.471** (2.775)
Multivariable	-1.676 (2.354)	-2.431 (2.350)	-3.504† (1.937)	0.927 (2.131)	0.044 (2.203)	-0.689 (1.976)
Real Analysis	-7.327*** (1.914)	-6.214*** (1.852)	-2.242 (1.565)	-8.089*** (1.779)	-7.223*** (1.746)	-4.448** (1.669)
Linear Algebra	2.438 (2.535)	1.606 (2.575)	0.639 (2.027)	1.222 (2.423)	0.892 (2.442)	0.510 (2.079)
Statistics	2.906* (1.422)	2.521† (1.402)	1.564 (1.129)	1.363 (1.266)	1.064 (1.275)	0.515 (1.120)
PhD Micro	-7.063*** (1.562)	-6.481*** (1.535)	-2.851* (1.181)	-5.193*** (1.312)	-5.276*** (1.307)	-2.643* (1.132)
Research Assistant	-3.101* (1.447)	-2.358† (1.366)	-0.985 (1.022)	-3.129* (1.240)	-2.739* (1.179)	-1.832† (1.038)
Senior Thesis	-2.699† (1.426)	-1.969 (1.377)	-1.031 (1.087)	-1.824 (1.242)	-1.331 (1.221)	-0.606 (1.088)

Results: Rank Outcomes

Table: Median- and Best-rank Outcomes

	Median Rank			Best Rank		
	NC	DC	Full	NC	DC	Full
Predoctoral Assistant	-5.621*** (1.658)	-3.346* (1.639)	0.160 (1.250)	-3.728* (1.458)	-2.122 (1.457)	0.025 (1.271)
NSF GRFP	-5.493* (2.219)	-6.136** (2.369)	-2.413 (1.938)	-7.257*** (1.449)	-7.240*** (1.976)	-4.219** (1.601)
Masters	6.504** (2.270)	3.231 (2.294)	1.466 (1.892)	4.640* (1.906)	2.221 (1.993)	1.150 (1.929)
Inter. English	-9.855*** (2.079)	-3.071 (2.413)	-2.718 (2.308)	-6.857*** (1.908)	-1.235 (2.340)	-1.336 (2.298)
Inter. Non-English	-2.034 (3.466)	4.694 (3.453)	0.498 (2.144)	-0.546 (3.078)	5.390 [†] (2.982)	2.107 (2.170)
Masters*Inter. English	-6.992 (4.333)	-2.601 (4.531)	2.383 (3.873)	-3.022 (4.129)	0.223 (4.290)	4.108 (3.964)
Masters*Inter. Non-Eng.	-12.857** (4.313)	-8.636* (4.154)	-5.153 [†] (2.745)	-8.083* (3.856)	-4.851 (3.601)	-2.714 (2.810)
(Intercept)	409.459*** (57.155)	328.519*** (54.977)	79.120 (50.467)	276.678*** (53.451)	212.149*** (52.516)	43.260 (53.849)
Num. obs.	530	530	530	530	530	530
R ²	0.432	0.516	0.705	0.392	0.470	0.586
Adj. R ²	0.413	0.481	0.681	0.372	0.431	0.552

Results: Probit Outcomes

Table: T10 and T30 Probit Outcomes

	T10 Probit	T30 Probit
Quantitative GRE	0.020 (0.012)	-0.004 (0.007)
$(\text{Quant} - \overline{\text{Quant}})^2$	0.003 (0.002)	-0.001 (0.001)
GPA out of 4.0	0.151 (0.105)	0.002 (0.064)
Multivariable	0.018 (0.053)	-0.043 (0.046)
Real Analysis	0.037 (0.045)	0.086* (0.042)
Linear Algebra	-0.070 (0.051)	-0.041 (0.041)
Statistics	-0.045 (0.037)	0.022 (0.031)
PhD Micro	0.114* (0.051)	0.007 (0.036)
Research Assistant	0.029 (0.038)	0.004 (0.034)
Predoctoral Assistant	-0.025 (0.042)	0.021 (0.037)
Senior Thesis	-0.001 (0.038)	0.083** (0.032)

Results: Probit Outcomes

Table: T10 and T30 Probit Outcomes

NSF GRFP	0.341*** (0.070)	0.203*** (0.014)
Masters	0.015 (0.071)	-0.055 (0.046)
Inter. English	-0.048 (0.072)	0.087 (0.078)
Inter. Non-English	-0.086 (0.059)	-0.089 (0.080)
Masters*Inter. English	-0.049 (0.115)	-0.236 (0.176)
Masters*Inter. Non-English	0.084 (0.105)	0.100 (0.059)
AIC	361.511	389.802
BIC	524.955	561.605
Log Likelihood	-139.755	-153.901
Deviance	279.511	307.802
Num. obs.	398	488

Discussion

- GRE and GPA are weaker signals among top applicants
 - Evidence for the screening hypothesis: 167.37 and 167.44
 - A 0.1 GPA difference is less than a rank
- Specific courses have strong value
 - Real analysis for best-rank and T30
 - Consider prerequisites
 - PhD micro is the most direct signal

Discussion

- Research experiences:
 - Undergrad RA for best-rank acceptance
 - Senior thesis for T30 acceptance
 - No evidence for full-time predoctoral work
 - Estimate is more precise with controls
 - Might not be a strong differentiating signal
 - Potential human capital gains

Discussion

- Nuanced master's degree finding
 - Significant for ITLNE for median rank
- Only fail to reject NSF null for median rank
 - Evidence for waitlist conversion mechanism
- Future research:
 - Human capital gains of predoc
 - PhD placements

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