

Low-Performing Student Responses to State Merit Scholarships

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Motivation

- Since the early 1990s, over half of U.S. states appealed to merit-based scholarships to reduce college costs for qualified resident students
- Programs generally reward in-state students with “free” college provided they meet certain eligibility criteria
 - Typically based on high school GPA, standardized test scores, class rank, or some combination
 - New Mexico Legislative Lottery Scholarship (NMLLS) in 1997
 - NMLLS only program where eligibility based on college performance

Motivation

- Resident students qualify if they:
 - graduate from a NM high school (or earn GED in NM)
 - enroll in a public institution in the next regular semester
 - earn 12 credits with a 2.5 GPA in their first semester of college, which is fully subsidized by the Bridge to Success Scholarship
 - hereafter referred to as the “qualifying semester”

Motivation

- Continued eligibility:
 - complete at least 12 new credit hours each term, maintain 2.5 cumulative GPA
- Funding capped at 8 semesters *after* qualifying semester
- LATE estimated for students around the 2.5 qualifying semester GPA

Literature

- Studies using administrative data find no completion effects (Sjoquist and Winters 2012, 2015; Jia, 2019)
- Studies using administrative data produce different findings (Scott-Clayton, 2011; Cohodes and Goodman, 2014; Erwin and Binder, 2018)
- Substantial variation in state program design drives different findings
- Recent study finds that program features matter (Jia, 2019)
 - Programs with lenient eligibility requirements are associated with higher bachelor's degree completion rates

Literature

- Contribution to literature:
 - estimates LATE for lower ability students that responded to the policy change
 - Other studies focus on higher ability students
 - Unique program structure allows for observation of select manipulation strategies during the cutoff
 - Can be used as the basis for a simple bounding exercise to account for potential selection bias

Preview of Findings

- Low-performing students:
 - no overall effect on college completion
 - are more likely to graduate within the program's funding cap (i.e., shorter time to degree)
- Some students successfully manipulate qualifying semester eligibility requirements by registering for fewer courses or dropping more courses
 - These students are low-ability, and their manipulation attenuates average completion outcomes for NMLLS recipients

Data

- Administrative data on all first-time, full-time University of New Mexico (UNM) resident students over the period 1997 – 1999
- 3,499 resident students
 - residents earning a high school equivalency in NM
 - enrolled at UNM in next regular semester
 - earned at least 12 credits during the qualifying semester
 - Meet all criteria except the 2.5 qualifying semester GPA
- Sample period chosen to avoid a confounding intervention introduced in 2000 (descriptives [here](#))

Empirical Model

- Fuzzy regression discontinuity (FRD) using minimum 2.5 qualifying semester GPA
- Why not sharp RD?
 - Policies allow exceptions for medical conditions and military service
 - Some students not meeting GPA requirement can petition on “special circumstances” grounds
 - NMLLS structured as a last dollar scholarship

Empirical Model

- 1st stage:

$$NMLLS_i = \alpha_0 + \alpha_1 Above_i + \alpha_2 GPAgap_i * Below_i + \alpha_3 GPAgap_i * Above_i + \mathbf{X}\boldsymbol{\theta} + v_i$$

- 2nd stage:

$$Y_i = \pi_0 + \tau_{FRD} \widehat{NMLLS}_i + \pi_1 GPAgap_i * Below_i + \pi_2 GPAgap_i * Above_i + \mathbf{X}\boldsymbol{\Gamma} + \varepsilon_i$$

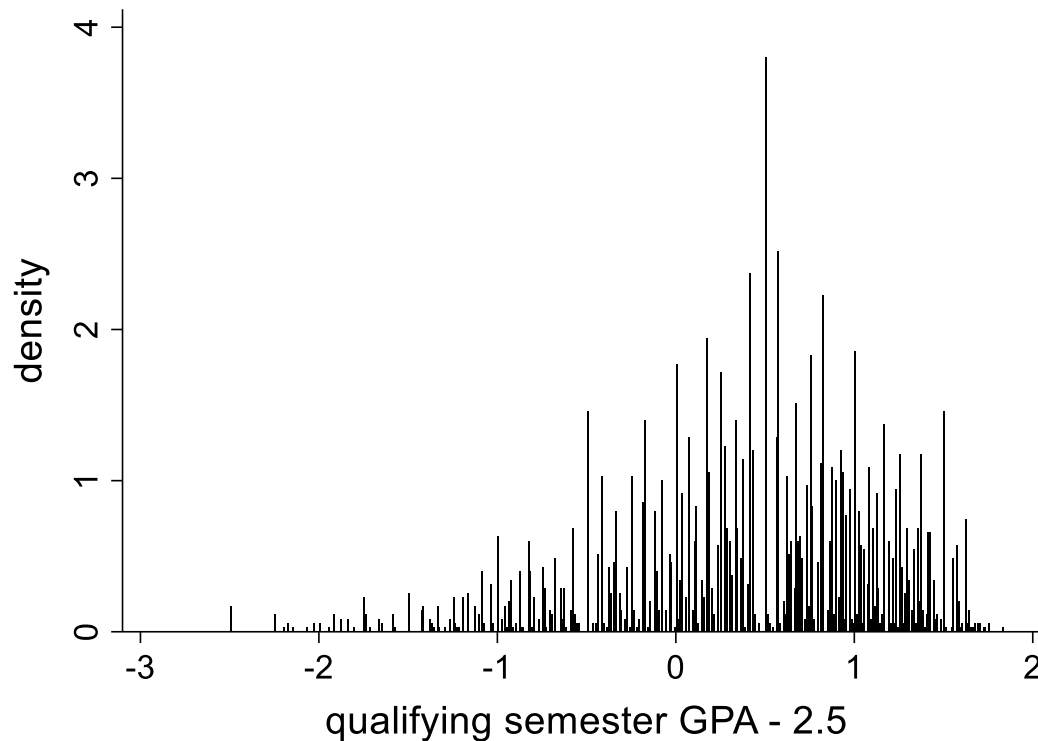
- \mathbf{X} includes gender, HSGPA, ACT, race-ethnicity, family income, and whether remedial coursework was required (upon admission)
- Outcomes are college completion, cumulative credits earned, and cumulative course withdrawals after each year

Empirical Model

- Three standard falsification tests are performed
 1. McCrary's (2008) test for density continuity
 - results [here](#)
 2. Models using false cutoffs
 - results [here](#)
 3. Using predetermined covariates as outcomes (placebo treatment effects)
 - results [here](#)

Empirical Model

- Heaps occur at multiples of $1/3$ and $1/4$, so estimates for non-heaped students are presented as the baseline



Empirical Model

- Manipulation by taking fewer courses or dropping courses
- Investigated by estimating additional placebo treatment effects (graphical results [here](#))

Outcome	
qualifying semester credits registered	-.685*
standard error	.369
$N_w^- N_w^+$	416 811
h	.484
qualifying semester credits earned	-1.151***
standard error	.438
$N_w^- N_w^+$	414 809
h	.451
qualifying semester credits withdrawn	.231*
standard error	.119
$N_w^- N_w^+$	528 1181
h	.668

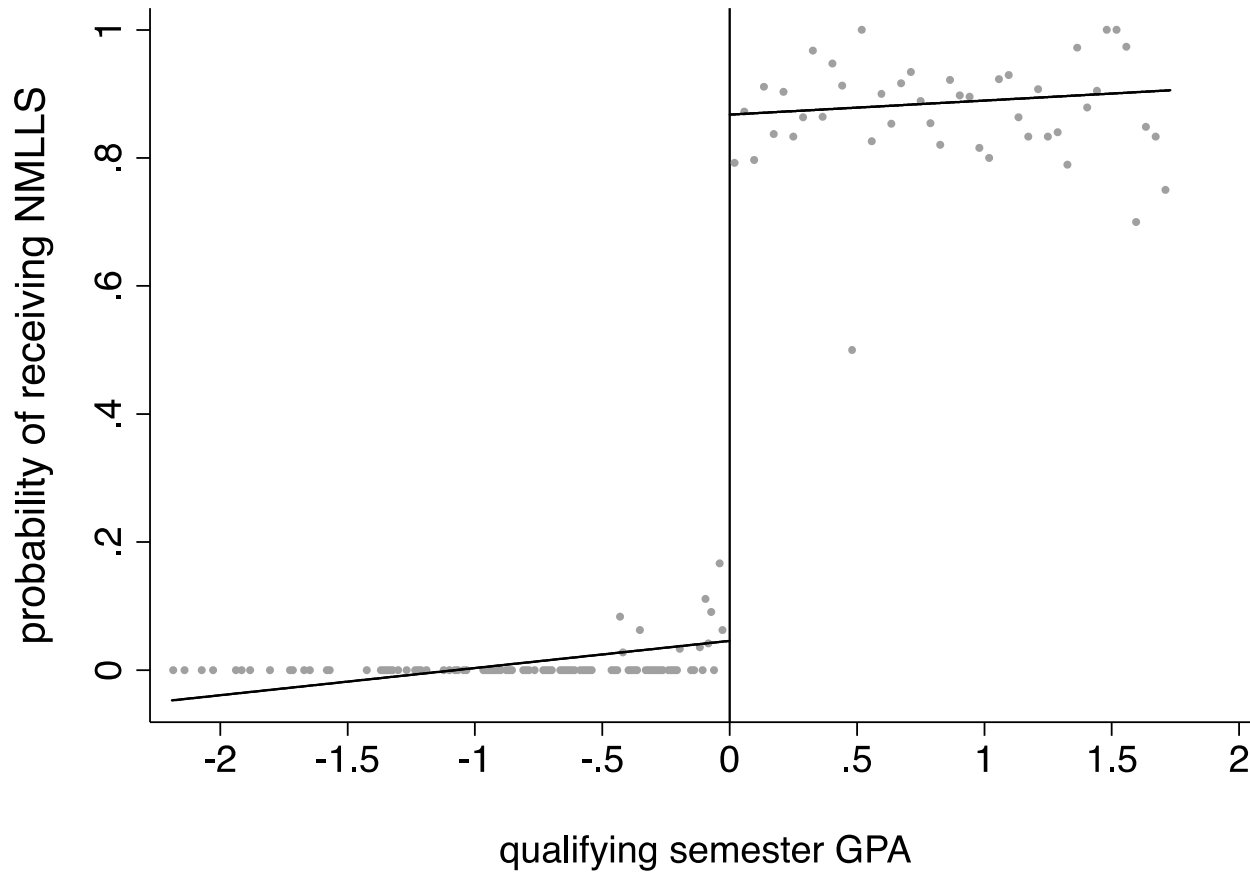
Empirical Model

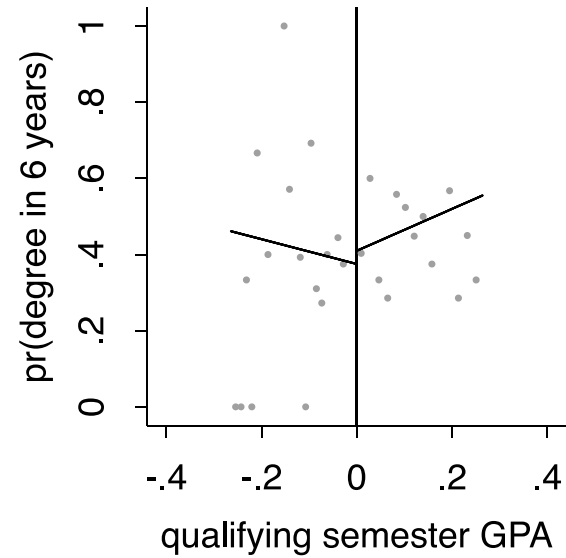
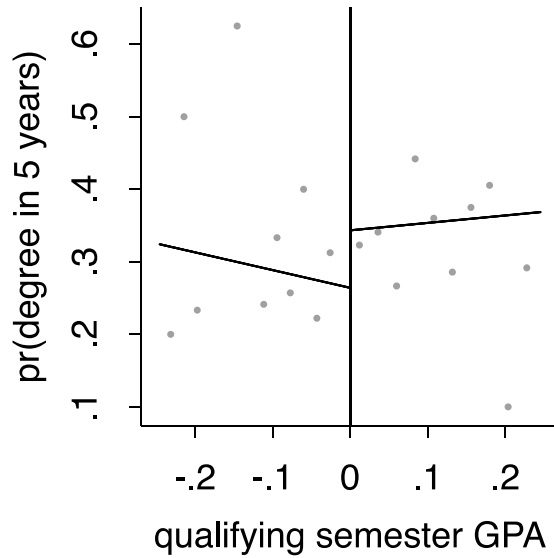
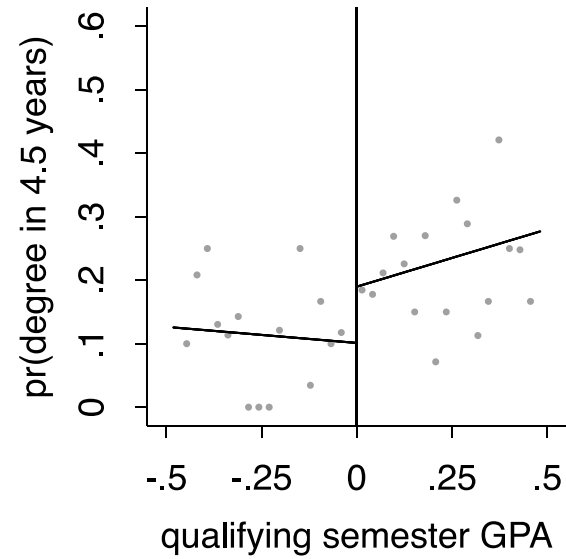
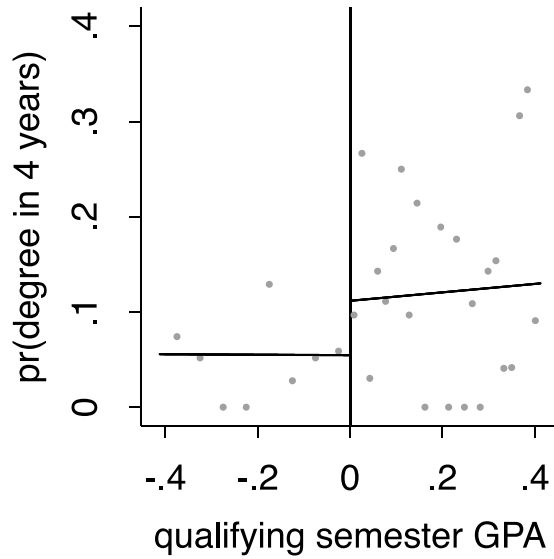
- Removing suspected manipulators:
 - a. NMLLS recipients
 - b. $2.5 \leq \text{qualifying semester GPA} \leq 2.75$
 - c. Registering for the minimum number of credits (12) for eligibility during the qualifying semester

OR

Registering for the standard 15 credit hours and dropping at least one credit during the qualifying semester
- Also consider qualifying semester GPAs ≤ 3.0
 - This removes approximately 3-6 percent of the sample

Graphical Results





Empirical Results

	Degree Completion		Credits Earned		Credits Withdrawn	
	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Less manipulators	Baseline	Less manipulators	Baseline	Less manipulators
In 4 Years	.108**	.172***	8.91	18.58**	1.54	3.52
SE	(.046)	(.062)	(6.54)	(9.49)	(3.87)	(6.75)
\bar{Y}	.173	.176	90.89	91.36	6.89	6.87
In 4.5 Years	.142*	.136*	8.22	17.00**	1.43	3.48
SE	(.075)	(.073)	(6.71)	(8.67)	(3.94)	(7.49)
\bar{Y}	.299	.301	98.26	98.72	7.43	7.42
In 5 Years	.082	-.054	7.41	15.66**	1.52	3.45
SE	(.127)	(.176)	(5.48)	(8.69)	(3.80)	(8.63)
\bar{Y}	.469	.471	102.60	103.09	8.05	8.04
In 6 Years	.017	-.075	9.21	20.95**	1.20	.91
SE	(.114)	(.210)	(6.21)	(8.69)	(5.13)	(11.91)
\bar{Y}	.571	.574	107.85	108.34	9.53	9.51
Observations					2,653	2,578

Empirical Results

- 7.4 percentage points (45%) and 12.7 percentage points (44%) more likely to graduate within 4 and 4.5 years, respectively
 - Suggests shorter time to degree but no overall change in completion
- Removing suspected manipulators increases magnitude and significance of effects on completions and credits earned
 - Supports notion that only low-ability students find it necessary to manipulate a relatively “low-bar” GPA cutoff

Conclusions

- Eligibility rules matter
 - funding caps may serve as an effective policy lever when trying to incentivize low-performing students to complete college in a timely manner
 - Students may take the minimum number of hours during a qualifying period when program eligibility is based on college performance
- Caveat: unobserved cutoff manipulation strategies may still be biasing results (e.g., taking easier courses during the qualifying semester)
- It is important to consider cutoff manipulation whenever financial aid eligibility rules are well known to students, even when passing “standard” tests for such responses

Job Opportunity

- We are hiring a postdoctoral fellow at the New Zealand Work Research Institute
- Requirements:
 - Ph.D. Economics
 - Applied person specializing in labor, health, education, or urban economics
 - Willingness to relocate to New Zealand for a two-year appointment
- Job posting [here](#) (closes April 19th)
- Contact me for details: christopher.erwin@aut.ac.nz



Conclusions

- Thank you for your time
- Questions?
- Contact the author at:
 - christopher.erwin@aut.ac.nz