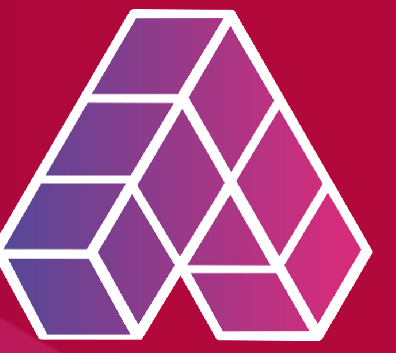




Emprendimiento, Aceleradoras y Políticas de Innovación



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Director Académico EPIC Lab



Temario

1. Programa de Investigación
2. ¿Aceleran las aceleradoras?
3. El efecto de la interacción social sobre las creencias y comportamientos
4. Heurísticas racionales para toma de decisiones en entornos dinámicos e inciertos
5. Breve reflexión acerca del libro de aceleradoras

The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile

Jointly with Juanita Gonzalez-Urbe (LSE)



Michael Leatherbee, Ph.D.
Academic Director Evidence-based Policy & Innovation Research Lab
Pontificia Universidad Católica de Chile

Entrepreneurship Policies and Socioeconomic Development

Public discussion

- Multiple experiments conducted by policymakers
- Program stakeholders requesting accountability



Do business accelerators affect new venture performance?
If so, how?

Academic background

- Startups and job creation (Haltiwanger, Jarmin & Miranda, 2013)
- Effects of capital on microenterprises (de Mel, McKenzie & Woodruff 2008)
- Private equity funding and venture performance (Goldfarb, Kirsch & Miller 2007)
- Angel investment and venture performance (Kerr, Lerner & Schoar 2014)
- Business training and performance (de Mel, McKenzie & Woodruff 2014)
- Managerial capital constraints (Bruhn, Karlan & Schoar 2012; Bloom & Van Reenen 2010)
- Indirect learning in accelerators (Hallen, Bingham & Cohen 2016)
- Accelerator spillovers (Fehder & Hochberg 2014)
- Accelerator founder effects (Leatherbee & Eesley 2014)

Study in Brief

What we do:

- Distinguish Start-Up Chile's venture performance treatment effect of:
1. Cash and co-working space (using rules-based selection of applicants)
 2. Basic services and education (competition among participants)

What we find:

1. Basic accelerator services appear to have no treatment effect
2. Entrepreneurship schooling (bundled with basic services) appear to causally increase performance
3. Evidence of positive spillovers and effects on failure

Research Setting - Business Accelerators

CRUNCH NETWORK
Accelerators Are The New Business School
 Posted Jul 11, 2015 by Vitaly M. Golomb (@vitalyg)



Vitaly M. Golomb
 CRUNCH NETWORK CONTRIBUTOR

Vitaly M. Golomb leads global investments at HP Tech Ventures and is the author of the forthcoming book, *Accelerated*

It's no secret that most startups fail. What's a bit less obvious is that most startup accelerators also fail. While a few top-tier programs get the cream of the crop unicorns of the future, the hundreds of others struggle to attract teams that will produce

Mechanism	Business School	Business Accelerators
Reputation (Rao1994; Zott and Huy, 2007)	Certification from selection, graduation from business school, diploma.	Certification from selection, graduation from entrepreneurship school, exposure to community.
Know-how (Lerner and Malmendier, 2013)	Developing and growing a company through classes, professors, guest speakers, career office, advisors, fellow classmates.	Developing and growing a start-up through workshops, staff, guest speakers, industry experts, mentors, fellow participants.
Social Networks (Granovetter, 1973; Ketchen, Ireland and Snow, 2007)	Preferential access to peer and professor networks.	Preferential access to peer and staff networks.
Self-efficacy (Bandura, 1982; Forbes, 2005)	Self-confidence from selection and graduation (in the form of business self-efficacy)	Self-confidence from selection and graduation (in the form of entrepreneurial self-efficacy)
Structured Accountability (Locke and Latham, 2002; Cialdini and Goldstein, 2004)	Setting learning goals, class work, homework, exams.	Setting strategic tasks, monthly follow-up meetings, demo-day



Managerial Capital



Entrepreneurial Capital

Start-Up Chile

Since 2010, MMUS\$40, ~1.500 participants

Policy objective: “cultural transformation” (perceived lack of entrepreneurial capital)

Provides (to all):

40,000 (USD) cash infusion (equity-free), shared office space in downtown Santiago, 1 year working visa if team is non-Chilean

Additionally (to top performing 20%):

Entrepreneurship schooling consisting in regular meetings, preferential treatment to learning/networking opportunities, differential exposure.

Requires:

Reallocation to Santiago for 6 months

Information 7 cohorts-3,258 applicants (including rejected ones)



Data

- Baseline attributes of all applicants provided by Start-Up Chile
- Hand-collected outcome variables for all applicants using web searches in fund-raising sites (AngelList, Crunch-Base), social media sites (LinkedIn, Facebook) and an industry source (CB Insights).
- Surveys **applicants** and **participants** (10% and 72% response rate)
- Performance outcomes: **fundraising** (likelihood and amount of capital raised, valuation) **scale** (market traction, employees) and **survival**



Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Correlation Web
Age	1,582	30.33	6.76	19.00	84.00	
Chilean	3,258	0.21	0.41	0.00	1.00	
Female	1,906	0.14	0.34	0.00	1.00	
Full time employees	2,248	2.46	1.46	1.00	10.00	
Money Raised	2,779	0.26	0.44	0.00	1.00	
Prototype under development	3,258	0.49	0.50	0.00	1.00	
Young (6 months)	3,258	0.56	0.50	0.00	1.00	
Web Indicator Capital	3,258	0.03	0.16	0.00	1.00	
Survey A. Indicator Capital	319	0.658	0.475	0.00	1.00	0.04
Survey P. Indicator Capital	145	0.579	0.495	0.00	1.00	0.17**
Web Employees	3,258	0.534	1.939	0.00	11.00	
Survey A. Employees	319	0.542	0.799	0.00	3.43	0.13**
Survey P. Employees	145	1.333	1.255	0.00	4.812	0.23**

Effect of Basic Accelerator Services

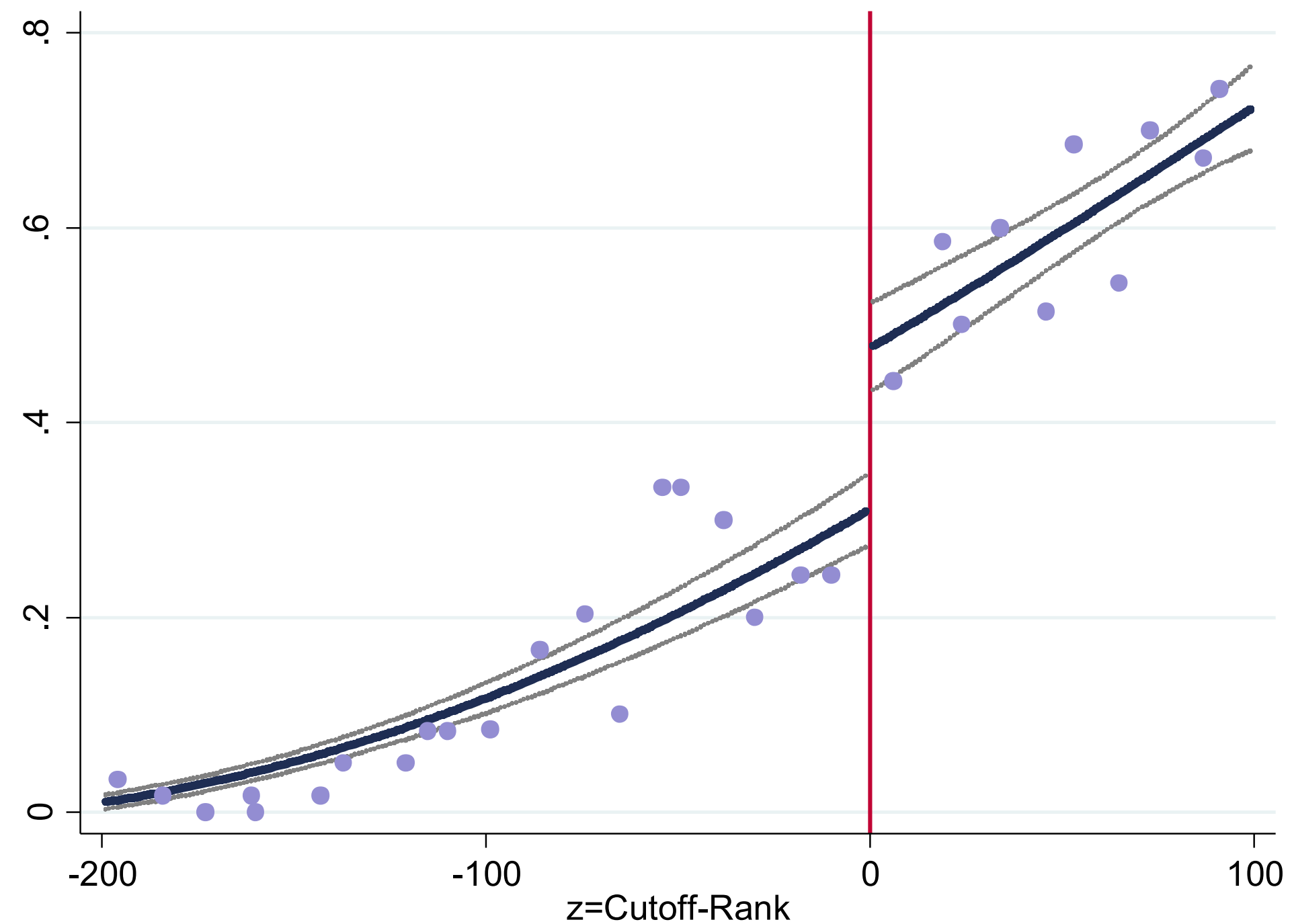
Empirical setup

- Applications every 4 months via YouNoodle
- Startups are ranked by randomly assigned external judges (unknown to applicant and other judges)
- Selection rule: Chilean government “roughly” picks top 100 applicants based on ranking-> budget constraint
- Identification strategy: Fuzzy RDD
 - Compares outcome across applicants that ranked closely higher and lower than the 100th applicant cut-off
 - Similar attributes but probability of selection jumps if ranking higher than the 100th applicant
 - Jump identifies LATE as long as: (1) sample is balanced, (2) there is no manipulation of the ranking (Hahn et al., 2001)

Effect of Basic Accelerator Services

Empirical setup

Probability of acceleration

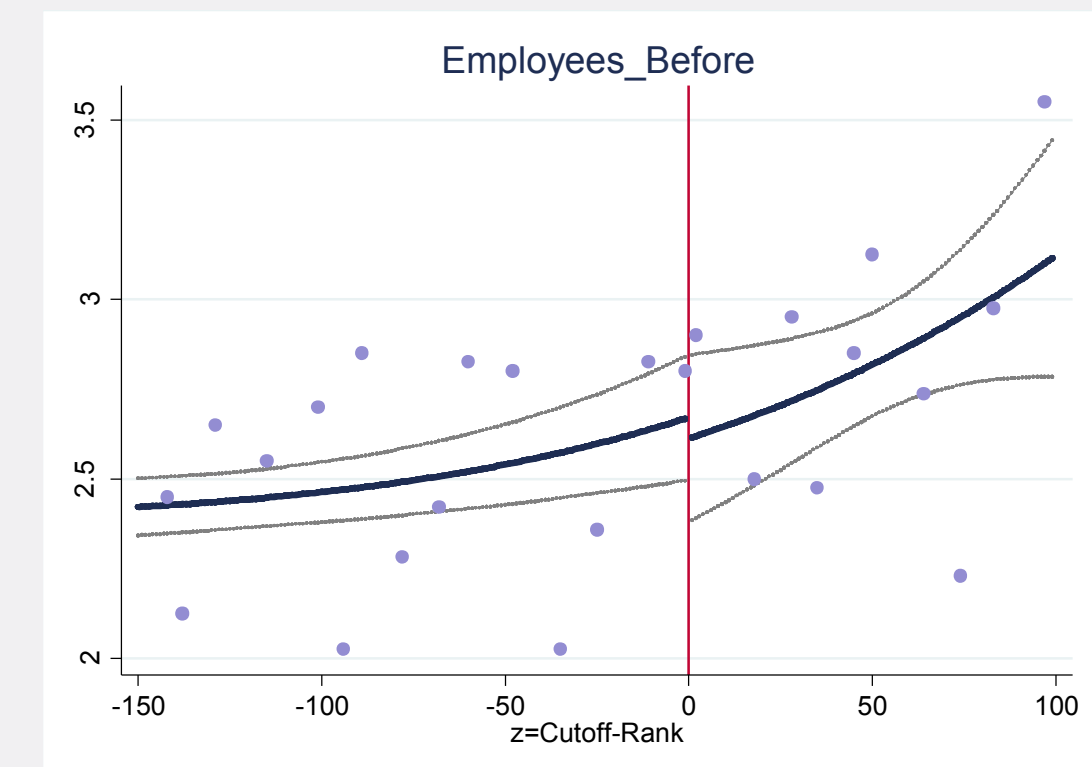
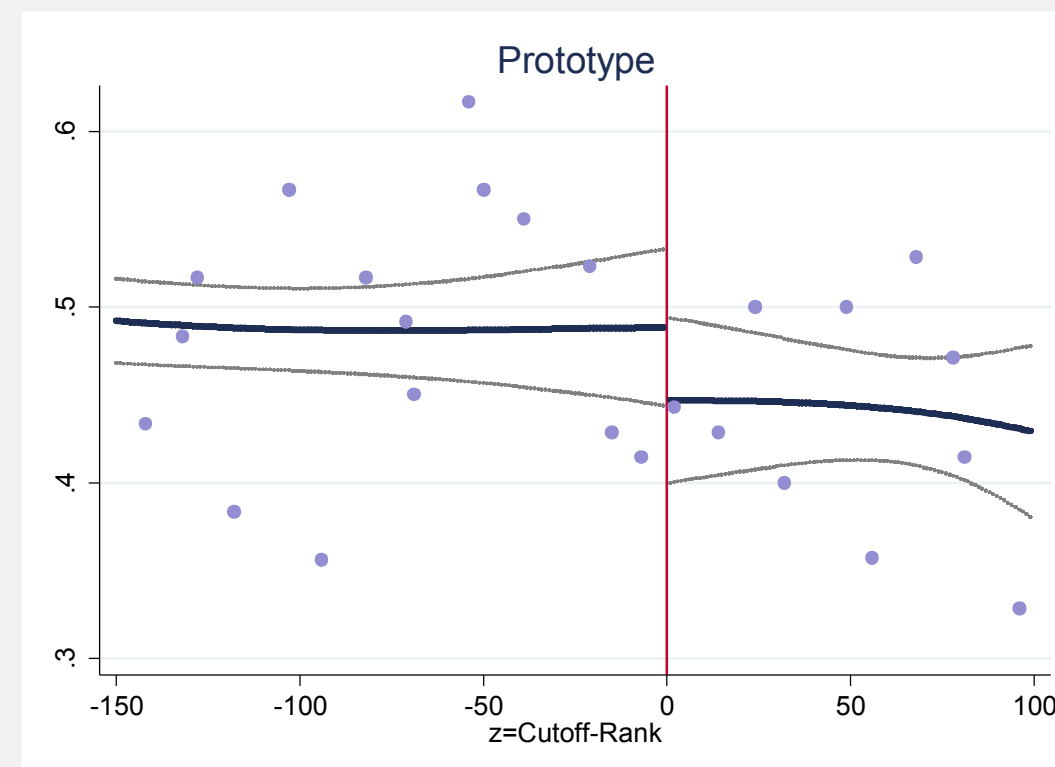
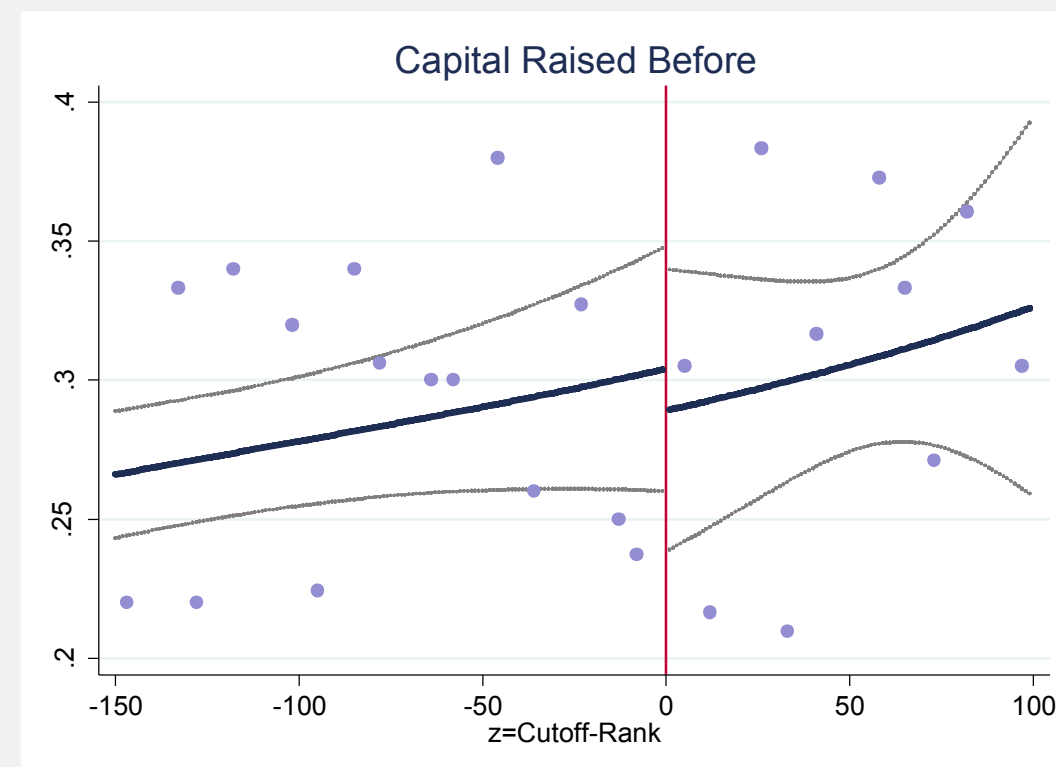
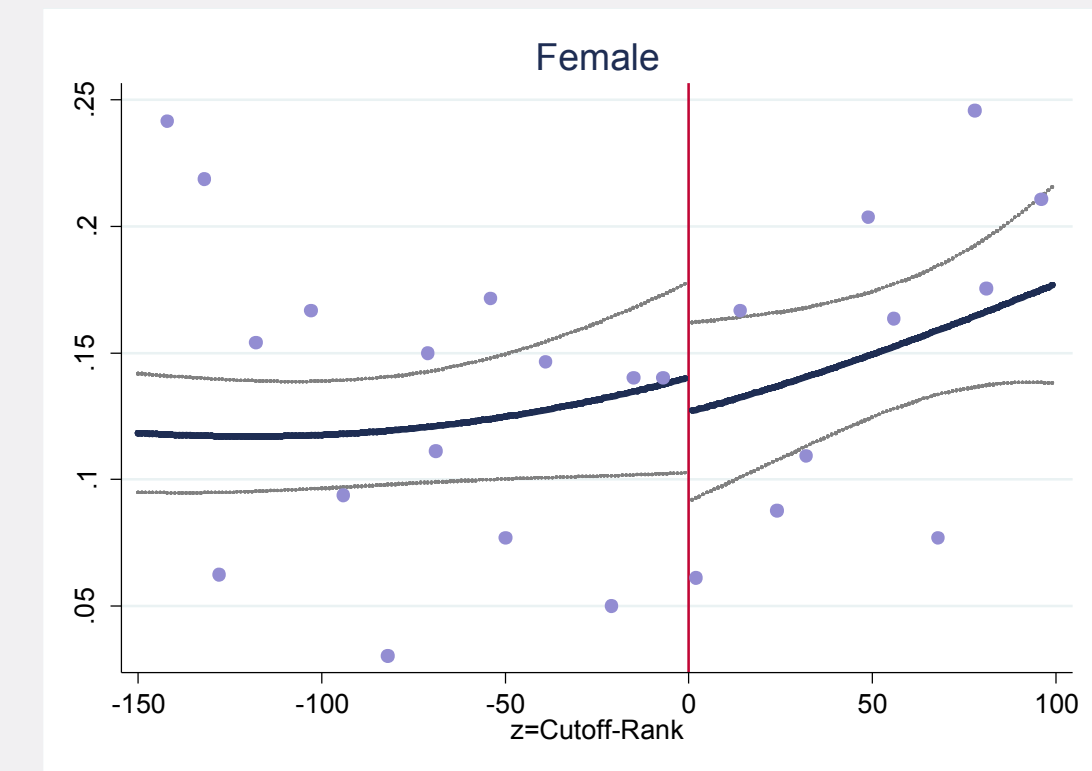
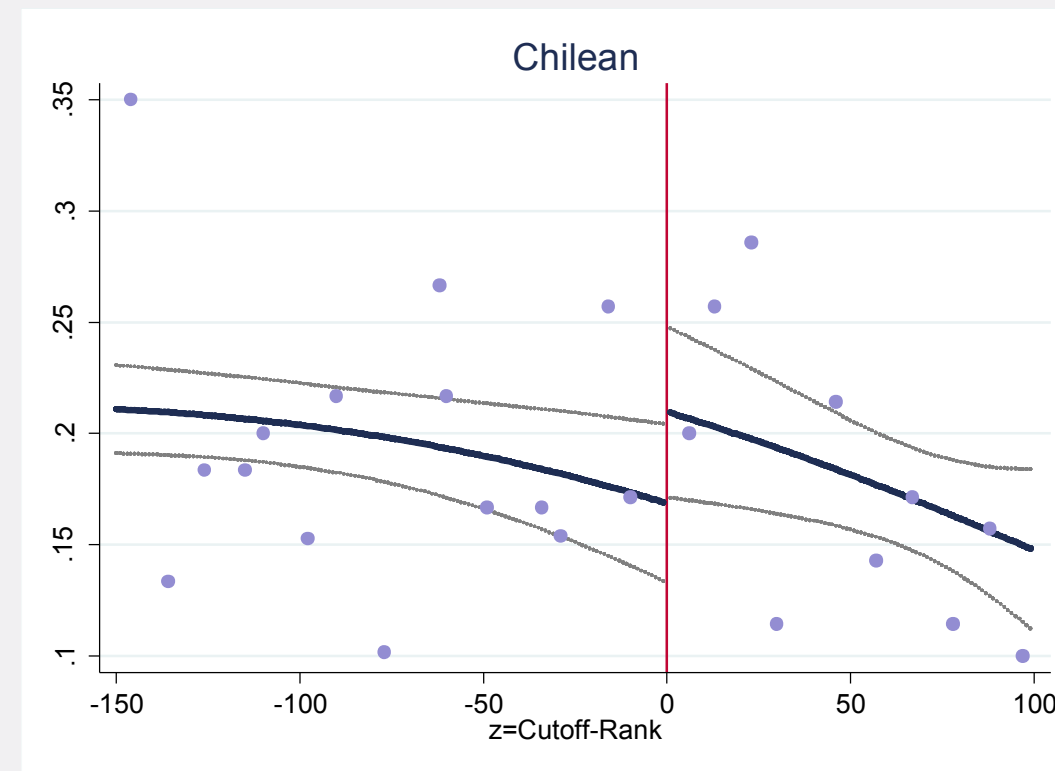
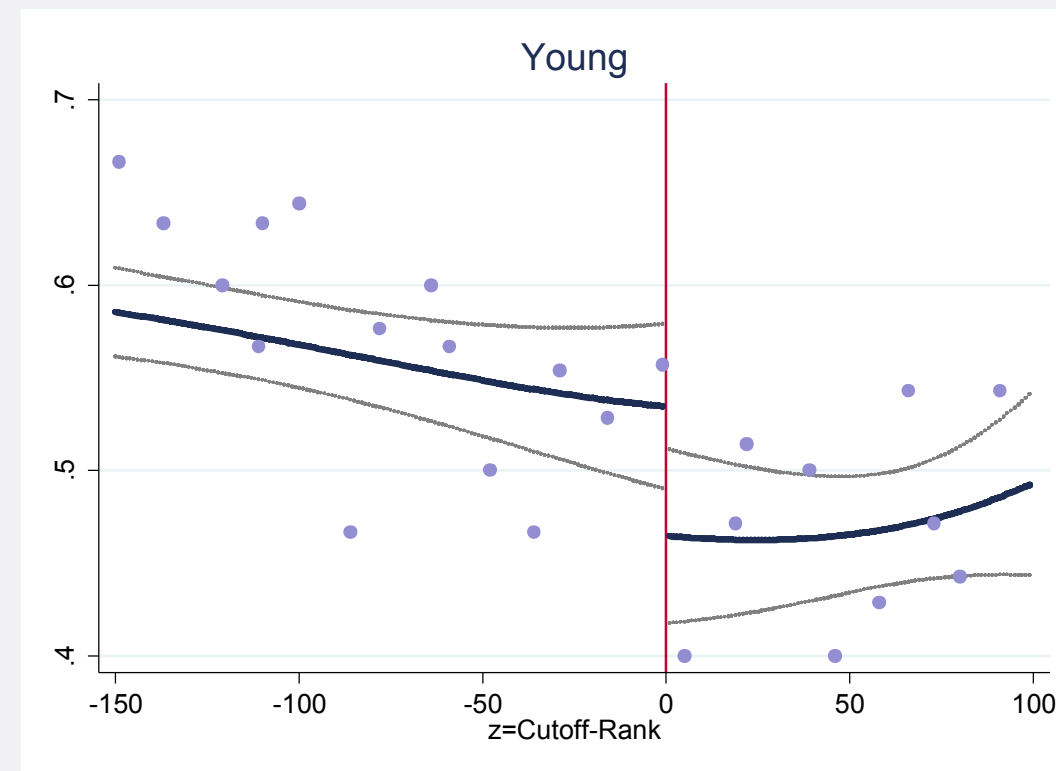


	(1)	(2)	(3)	(4)	(5)
	p=1 & h=50	p=1, controls & h=50	p=2	p=2 & controls	p=3
Higher	0.303*** (0.071)	0.319*** (0.083)	0.207*** (0.035)	0.191*** (0.044)	0.176*** (0.042)
Obs.	682	499	3,258	1,906	3,258
R-squared	0.070	0.128	0.397	0.447	0.398

$$acceleration_s = \delta + \gamma higher_s + f(Rank_s - cutoff)^g + X_s + \varepsilon_s$$

Effect of Basic Accelerator Services

Balanced Sample

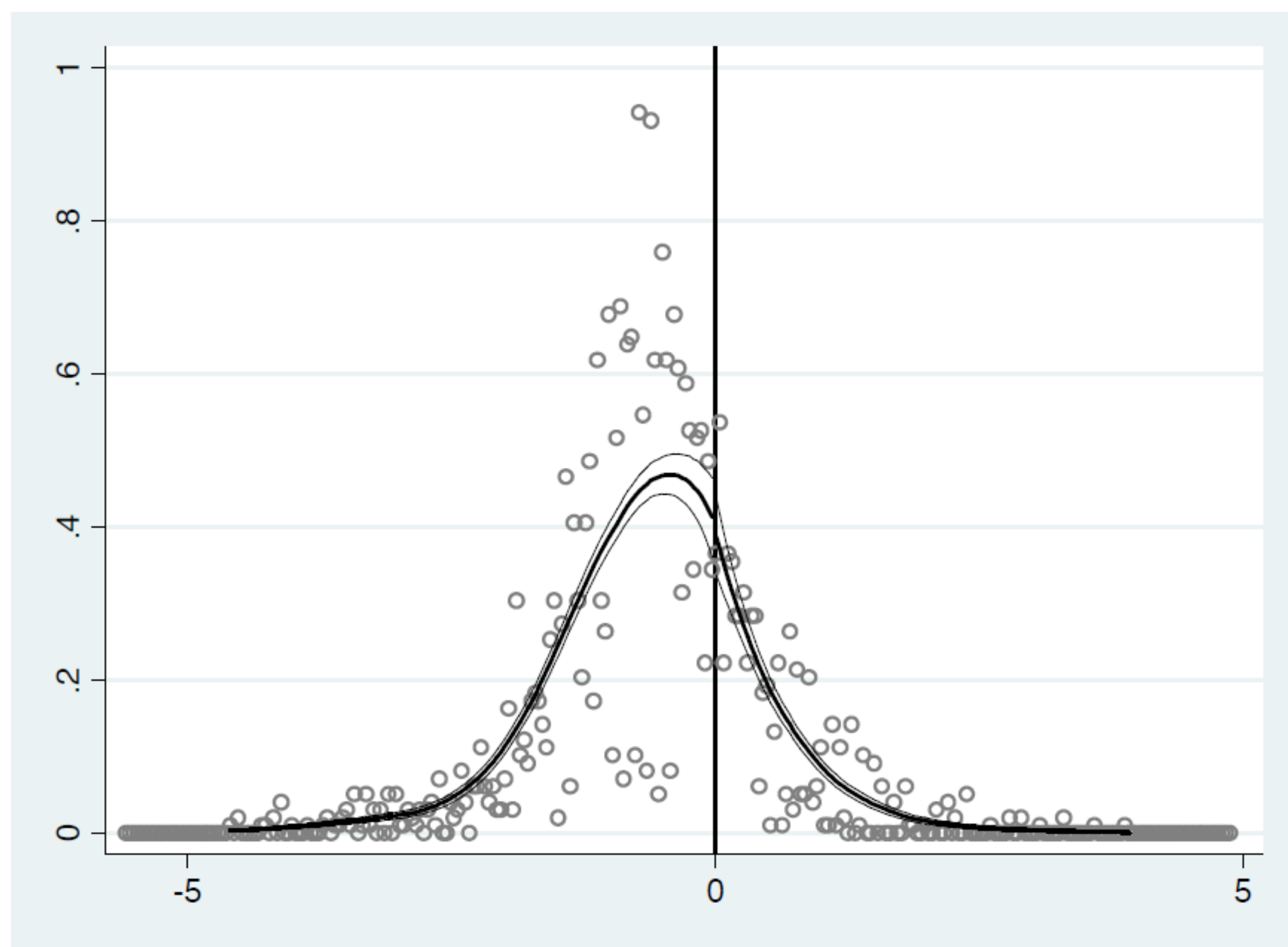


$$outcome_s = \delta + \gamma higher_s + f(Rank_s - cutoff^g) + X_s + \varepsilon_s$$

Effect of Basic Accelerator Services

Manipulation test

Density of Judge's Scores (McCrary Test)



Unlikely manipulation

- Identity of judges unknown to applicants and other judges
- No judge observes all scores
- Applicants do not observe their score
- Ranking generated automatically in YouNoodle

Effect of Basic Accelerator Services

Results

$$outcome_s = \pi + \beta acceleration_s + \check{f}(Rank_s - cutoff^g) + X_s + \epsilon_s$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Estimate	OLS	OLS & controls	p=1 & h=50	p=1, controls & h=50	p=2	p=2 & controls	p=3	p=3 & controls	p=4	p=4 & controls
Web Capital Indicator	0.062*** (0.011)	0.056*** (0.012)	-0.005 (0.089)	-0.047 (0.119)	0.037 (0.071)	0.062 (0.110)	0.065 (0.098)	0.088 (0.116)	0.049 (0.103)	0.056 (0.142)
Web Capital Raised	1.215*** (0.159)	1.019*** (0.168)	0.956 (1.244)	0.355 (1.501)	0.439 (0.999)	0.106 (1.454)	0.160 (1.443)	0.056 (1.558)	0.117 (1.497)	0.108 (1.876)
Web Traction	0.079*** (0.018)	0.044** (0.020)	-0.235 (0.184)	-0.405* (0.229)	0.021 (0.125)	0.006 (0.190)	-0.053 (0.206)	-0.089 (0.217)	-0.039 (0.203)	-0.108 (0.244)
Web Employees	0.655*** (0.112)	0.315** (0.131)	-1.704 (1.301)	-2.615 (1.709)	-0.674 (0.911)	-1.514 (1.462)	-1.255 (1.275)	-1.974 (1.506)	-1.385 (1.375)	-2.880 (2.050)
Web Survival	0.305*** (0.021)	0.250*** (0.023)	-0.037 (0.233)	-0.136 (0.265)	0.199 (0.165)	0.284 (0.218)	0.282 (0.225)	0.314 (0.223)	0.272 (0.238)	0.426 (0.284)
Survey A. Indicator Capital	0.163*** (0.054)	0.181*** (0.067)	-0.352 (0.342)	-1.048 (0.818)	-0.456 (0.701)	-1.392 (1.764)	-0.328 (0.571)	-0.925 (1.010)	-0.593 (0.762)	-1.607 (2.118)
Survey A. Capital Raised	2.477*** (0.601)	2.829*** (0.753)	-4.067 (3.845)	-11.296 (8.811)	-5.207 (7.919)	-14.214 (19.055)	-4.273 (6.598)	-10.467 (11.675)	-6.460 (8.566)	-16.954 (23.435)
Survey A. Valuation	1.068 (0.791)	2.058** (0.990)	1.091 (4.211)	-2.250 (7.765)	-0.682 (8.648)	0.055 (13.988)	1.110 (7.315)	-0.776 (10.354)	1.672 (8.809)	-6.340 (17.965)
Survey A. Traction	0.288 (0.569)	0.249 (0.696)	-5.102 (3.208)	-10.221 (8.211)	-6.281 (6.998)	-13.333 (16.935)	-6.459 (5.837)	-11.140 (10.847)	-6.842 (7.350)	-15.270 (20.882)
Survey A. Employees	0.092 (0.099)	0.161 (0.120)	-0.575 (0.656)	-2.123 (1.530)	-1.274 (1.376)	-3.610 (3.988)	-0.967 (1.116)	-2.541 (2.244)	-1.319 (1.461)	-3.454 (4.307)
Survey A. Survival	0.178*** (0.055)	0.197*** (0.069)	-0.396 (0.348)	-0.114 (0.679)	0.422 (0.640)	0.545 (0.954)	0.187 (0.540)	0.357 (0.674)	0.070 (0.654)	0.549 (1.077)

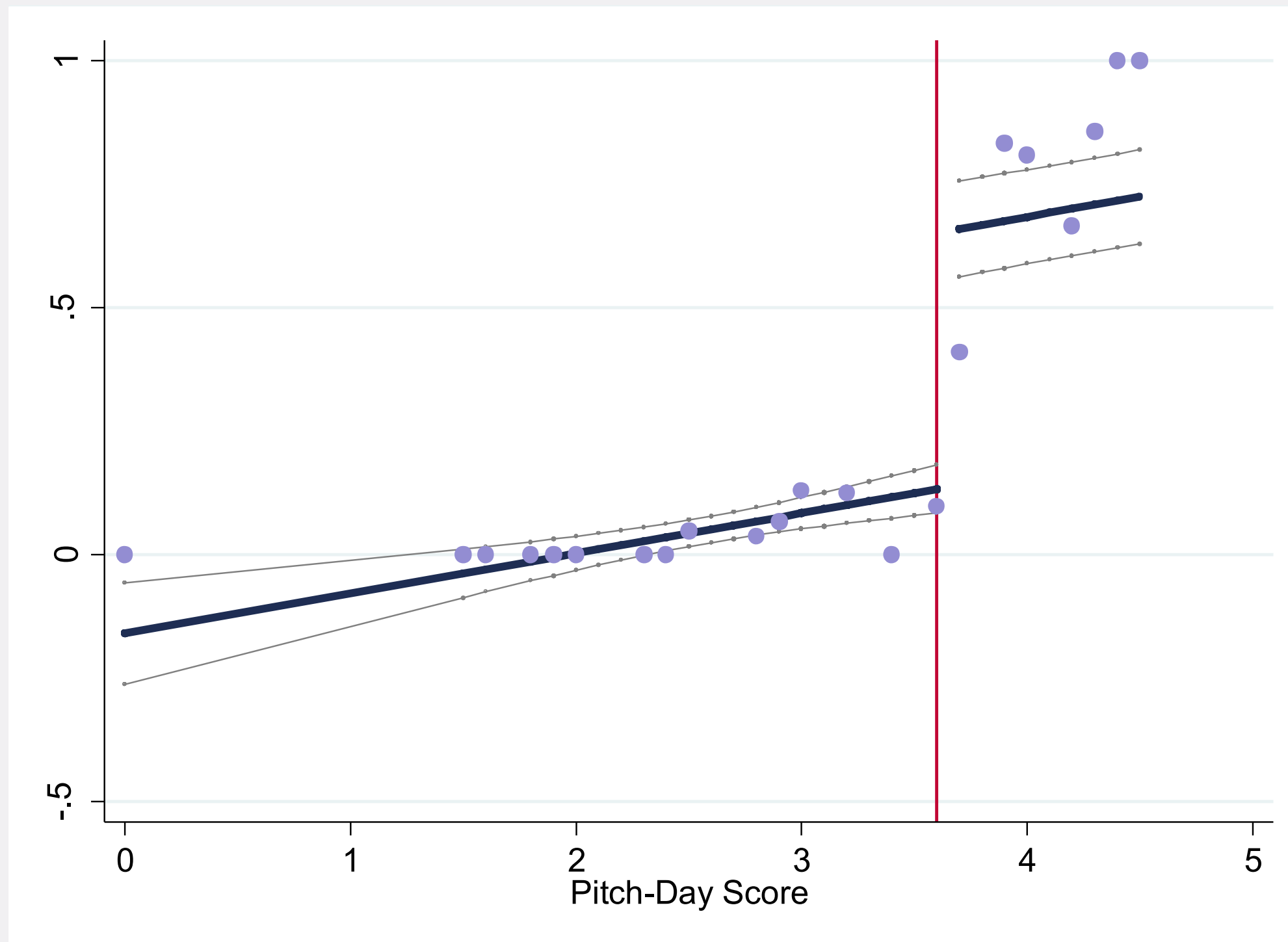
Effect of Entrepreneurship Schooling

Empirical setup

- Subprogram of the accelerator, open to competitively selected participants after 2 months of the basic program (5th cohort)
- In addition to basic services (cash and desk):
 - Monthly meetings that provide structured accountability (~4 meetings)
 - Access to mentors and external speakers
 - Validation and visibility-> names are published in webpage, representation Start-up Chile in entrepreneurship-related events
- Selection via Silicon Valley style “Pitch-day” competition
- Accelerator picks “students” (20%) based on scores (0-5) from judges
- An informal selection rule is evident in data: above 3.6 are 52% more likely to be schooled
- Fuzzy RDD around 3.6 Pitch-day score

Effect of Entrepreneurship Schooling

Empirical setup

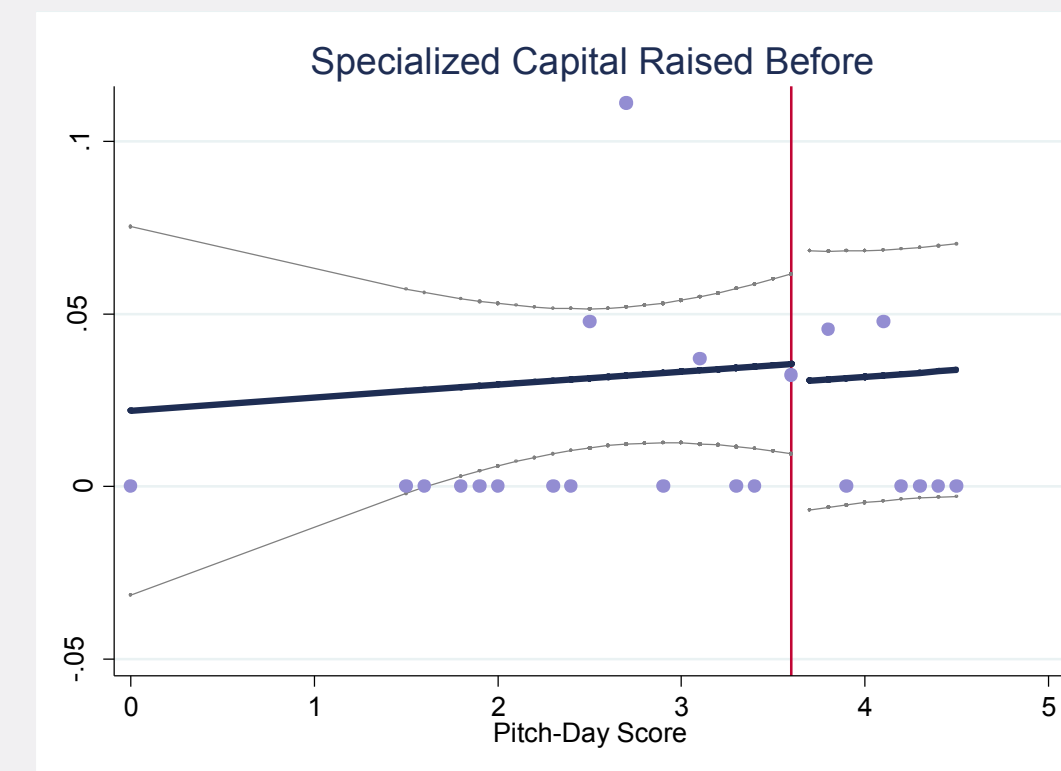
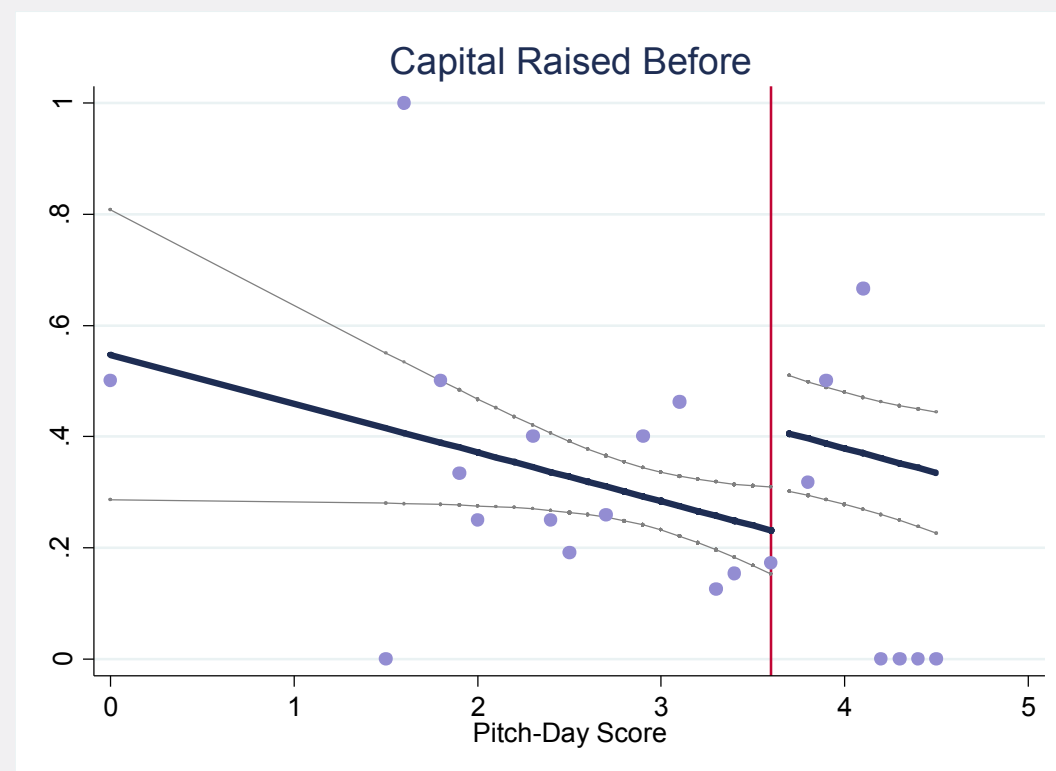
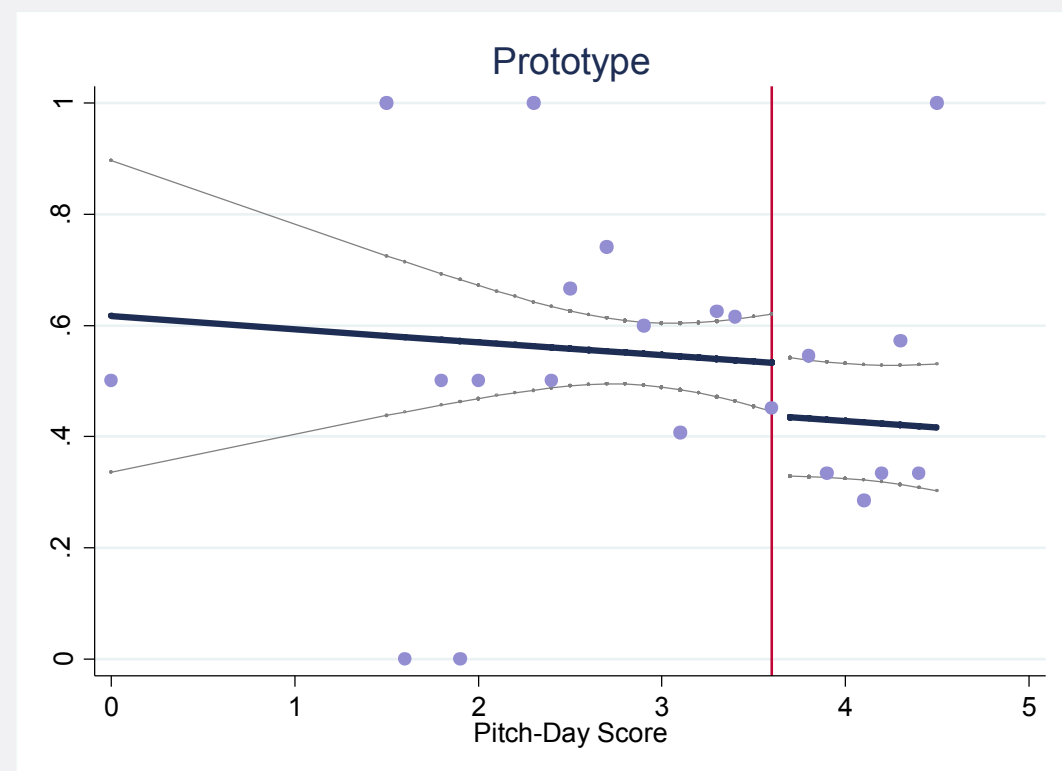
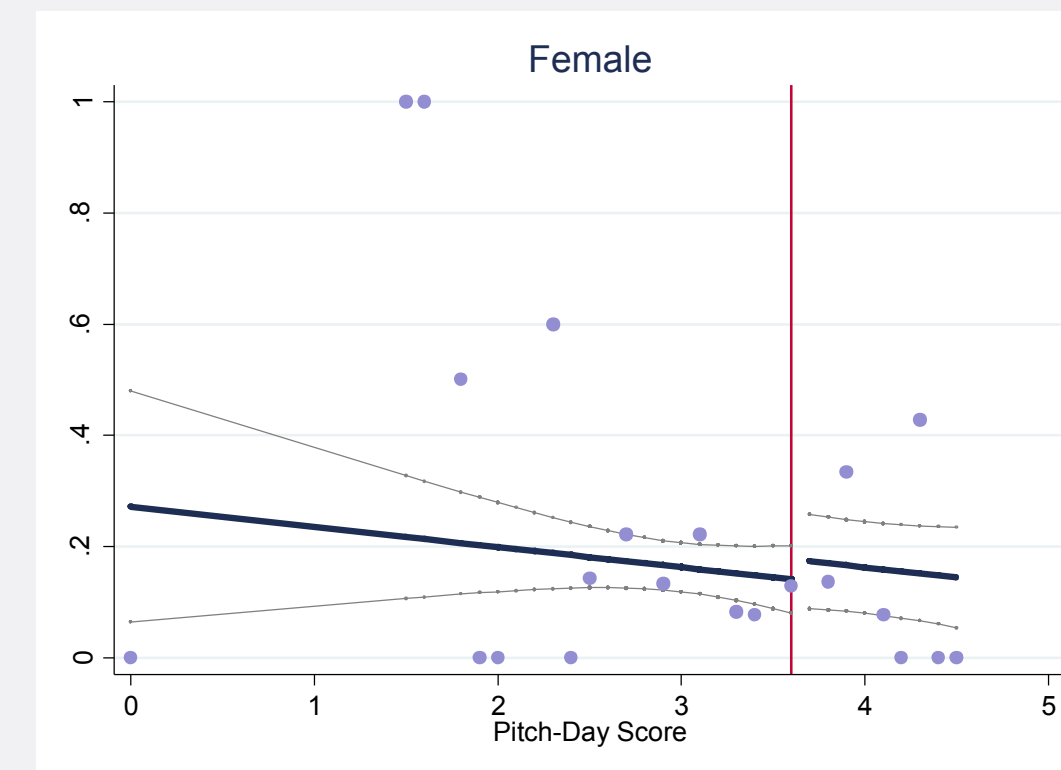
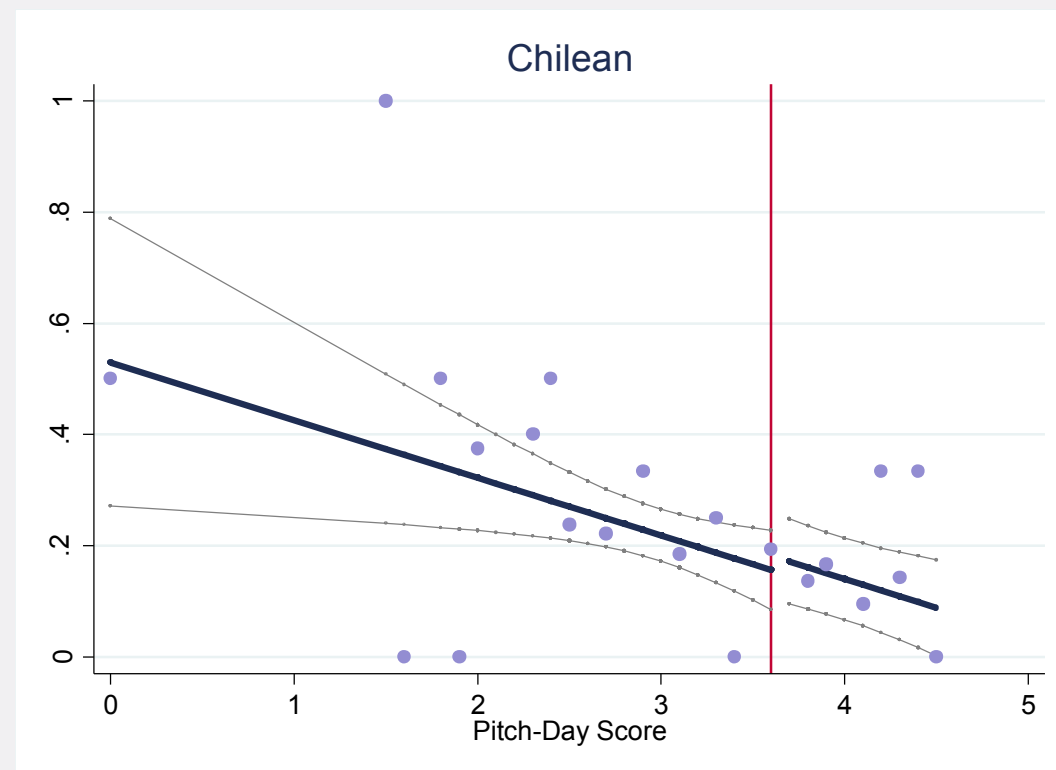
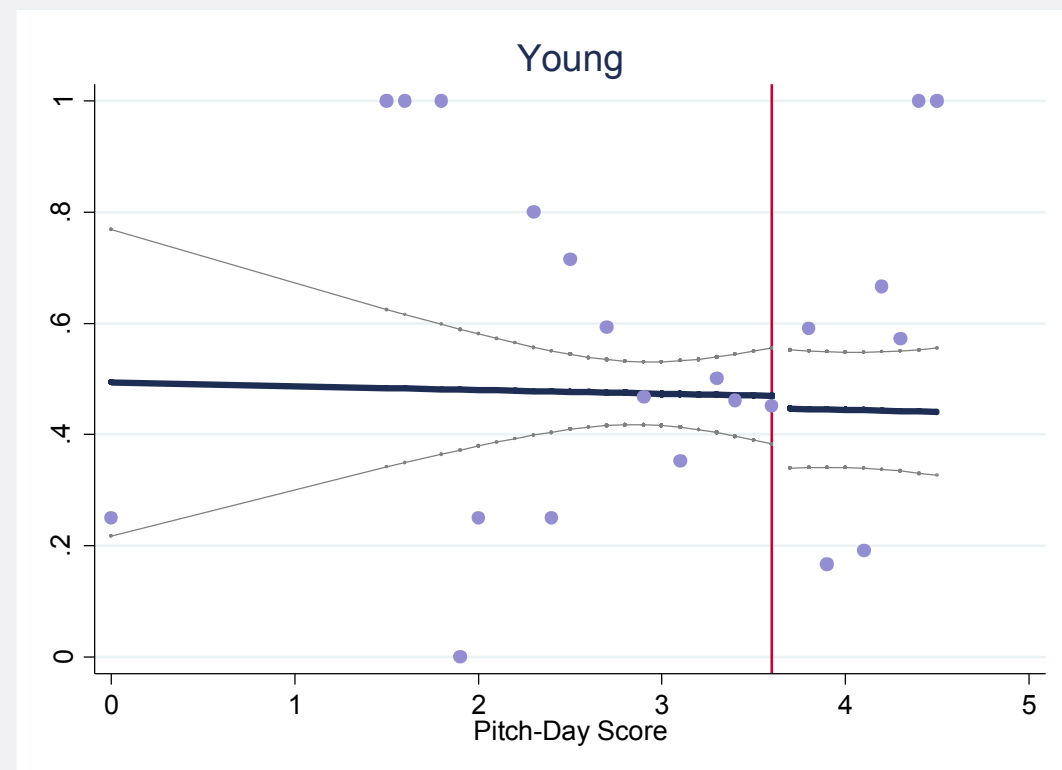


	(1)	(2)	(3)	(4)
	p=1	p=1 & controls	p=1 & controls & h=1.5	p=1 & h=1
<i>Above</i>	0.519*** (0.072)	0.509*** (0.073)	0.420*** (0.085)	0.440*** (0.094)
Observations	276	276	265	248
R-squared	0.398	0.435	0.440	0.385

$$school_s = \tau + \mu Above + g(Pitch_Day\ Score_s - 3.6) + \varepsilon_s$$

Effect of Entrepreneurship Schooling

Balanced Sample

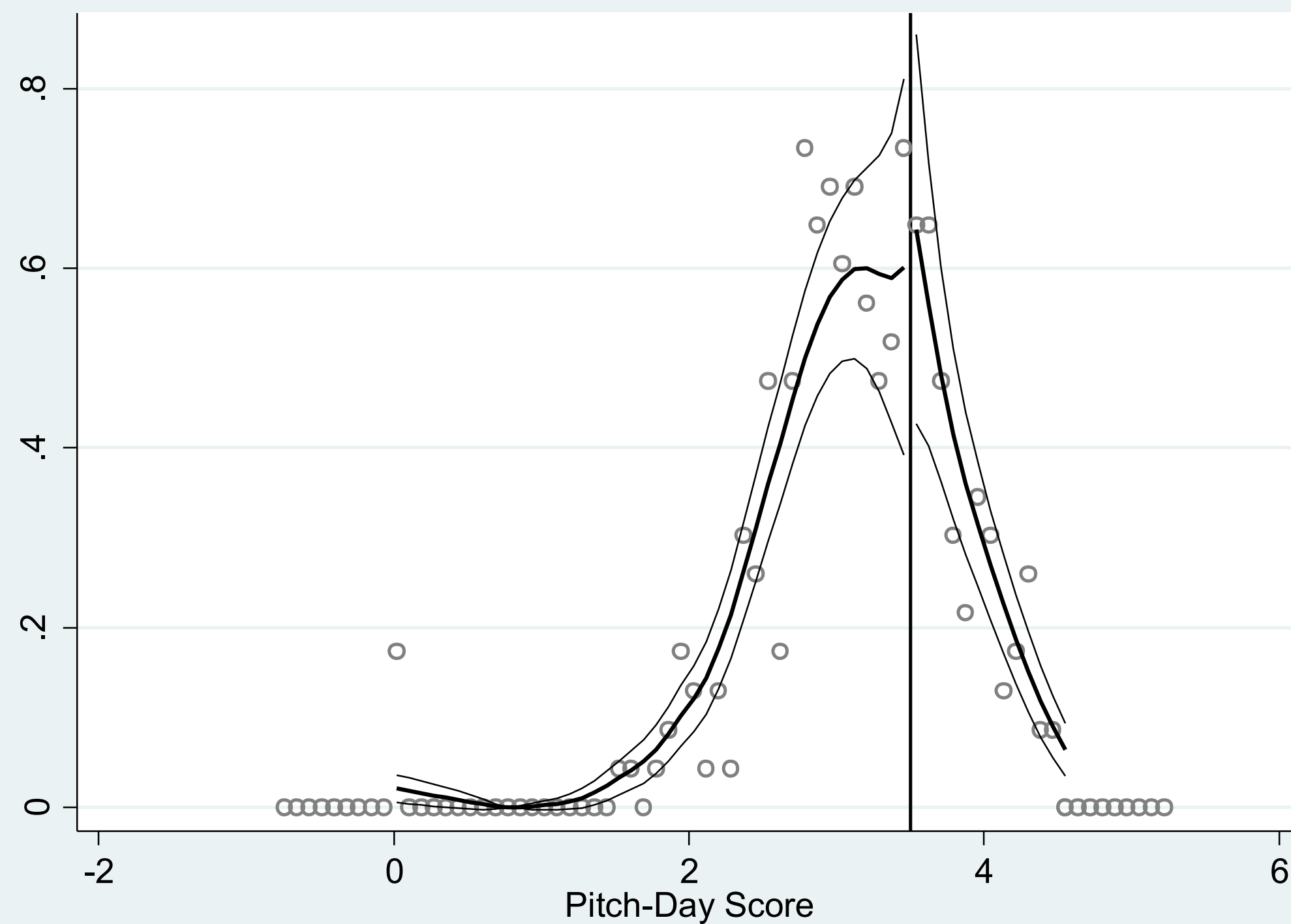


$$covariate = \sigma + \omega Above + \check{g}(Pitch_{Day}Score - 3.6) + \epsilon$$

Effect of Entrepreneurship Schooling

Manipulation test

Density of Judge's Scores (McCrary Test)



Unlikely manipulation

- Judges are external: not the future mentors
- Judges cannot observe scores given by others
- Applicants do not know identity of judges before competition
- Staff compile all scores: no judge observes all scores
- Final decision made by staff: close doors based on scores.

Effect of Entrepreneurship Schooling

Results

$$outcome_s = \pi + \beta school_s + \gamma (Pitch_Day\ Score_s - 3.6) + X_s + \epsilon_s$$

	(1)	(2)	(3)	(4)	(5)	(6)
Estimate	OLS	OLS & controls	p=1	p=1 & controls	p=1 & controls & h=1.5	p=1 & h=1
Web Capital Indicator	0.091* (0.052)	0.088* (0.052)	0.210* (0.118)	0.207* (0.115)	0.250 (0.161)	0.312* (0.189)
Web Capital Raised	1.633** (0.745)	1.560** (0.683)	3.034* (1.576)	3.008** (1.504)	4.382** (2.175)	6.019** (2.667)
Web Traction	0.142* (0.077)	0.134** (0.063)	0.238* (0.128)	0.229** (0.115)	0.354** (0.159)	0.413** (0.202)
Web Employees	0.379 (0.384)	0.400 (0.349)	1.985* (1.086)	1.890* (1.124)	2.280* (1.374)	2.891** (1.360)
Web Survival	0.100 (0.071)	0.066 (0.068)	0.087 (0.183)	0.107 (0.180)	0.340 (0.255)	0.335 (0.278)
Survey P. Indicator Capital	0.329*** (0.080)	0.346*** (0.080)	0.455** (0.199)	0.422** (0.210)	0.243 (0.316)	0.217 (0.296)
Survey P. Capital Raised	4.246*** (1.038)	4.501*** (1.031)	6.253** (2.533)	5.739** (2.661)	3.551 (3.890)	3.613 (3.711)
Survey P. Valuation	2.411* (1.436)	2.218 (1.455)	5.520* (3.284)	4.984 (3.497)	8.794* (5.028)	7.972* (4.590)
Survey P. Traction	1.345 (1.197)	1.399 (1.223)	4.226 (2.733)	3.662 (2.868)	2.118 (4.183)	-0.438 (3.848)
Survey P. Employees	0.548** (0.250)	0.580** (0.252)	0.871 (0.550)	0.693 (0.581)	0.897 (0.787)	0.779 (0.749)
Survey P. Survival	0.134 (0.088)	0.143 (0.090)	-0.044 (0.219)	-0.142 (0.232)	-0.082 (0.316)	-0.050 (0.303)

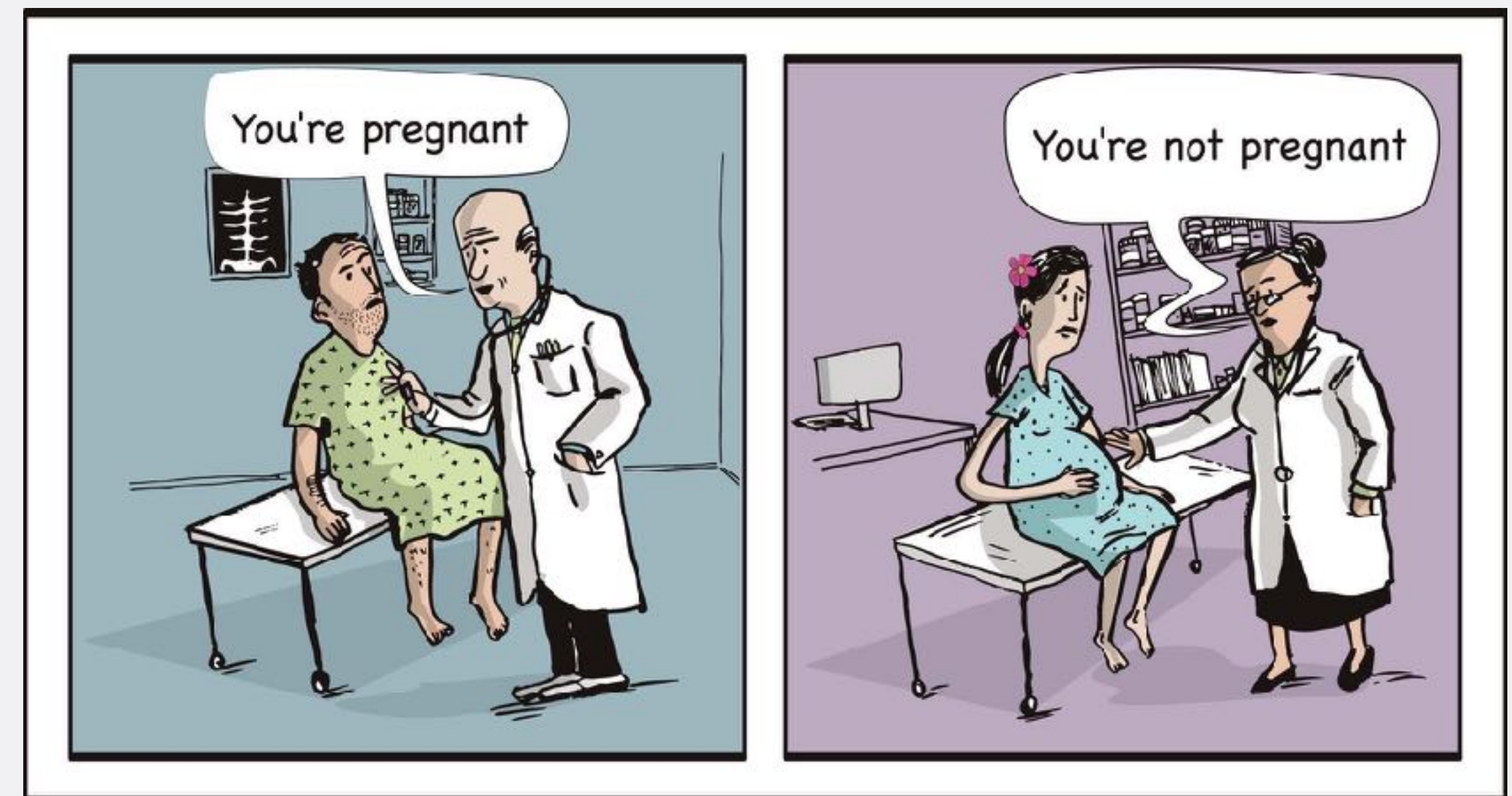
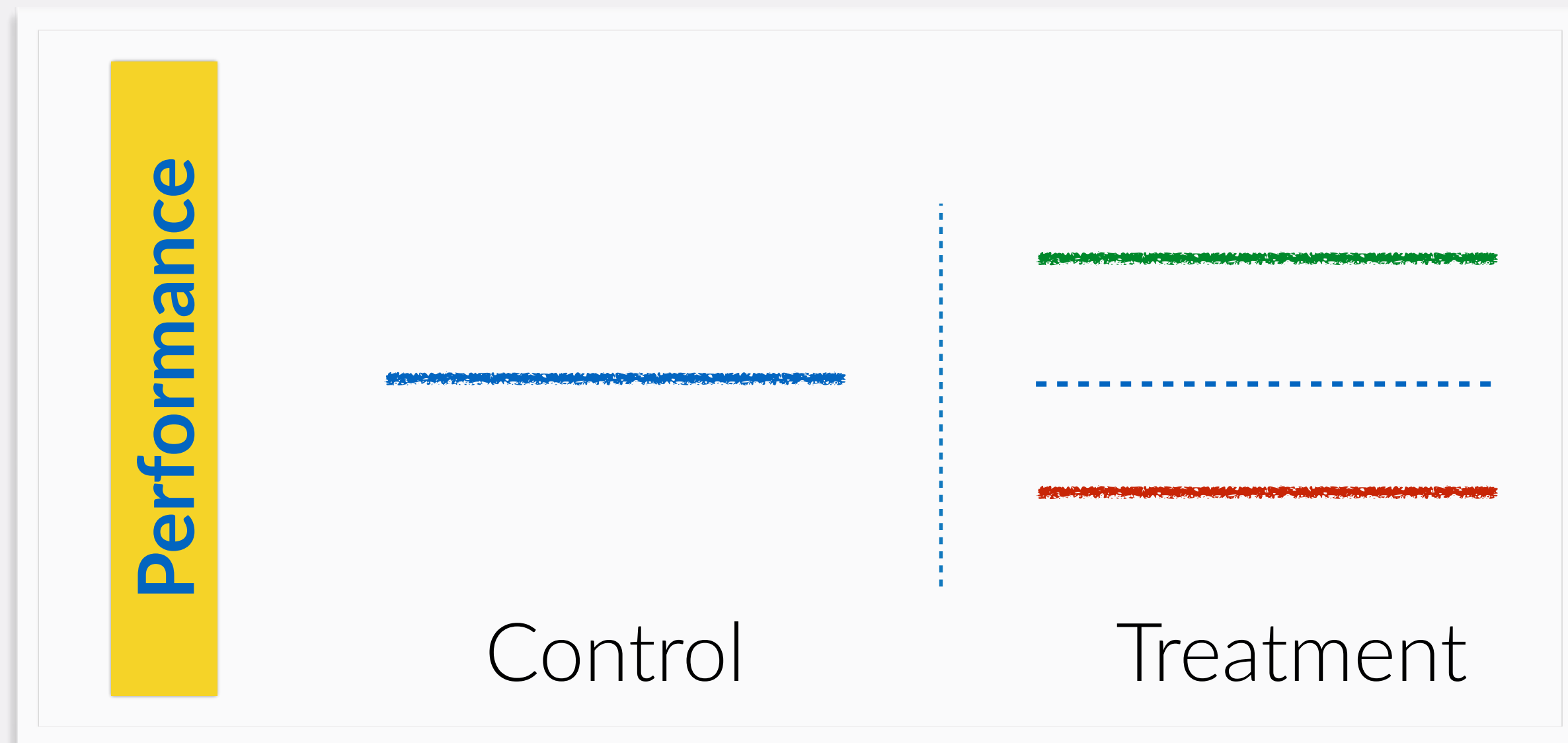
- Economic Magnitude:
- 21% increase in likelihood of raising capital
 - 3x amount of capital raised
 - 24% increase in market traction
 - 2x increase in employees

Discussion



Are Accelerators Worthwhile?

- Yes, to the extent the schooling services can be expanded.
- Are the basic services completely useless?
 - Evidence suggests a “false negative”
 - Acceleration of growth *and* failure?



False Positive

False Negative

Are Accelerators Worthwhile?

- Evidence of regional spillovers
 - Founding increase by 6% around Start-Up Chile
 - Demo-days have an effect on early-stage deals (Fehder & Hochberg 2014)

Regional Effects: New-business registration rates

	(1)	(2)	(3)	(4)
	Number	Number	Log.	Log.
Post 2010× Contiguous	0.314*** (0.097)		0.024*** (0.005)	
Post 2010× Contiguous ×Venture		0.483** (0.213)		0.060*** (0.022)
Observations	426,180	426,180	426,180	426,180
R-squared	0.043	0.900	0.062	0.783
Comuna FE	Yes		Yes	
Year FE	Yes		Yes	
Industry×Year FE		Yes		Yes
Industry×Comuna FE		Yes		Yes
Comuna×Year FE		Yes		Yes

Conclusion



Conclusion

- Business accelerators new institutional form in the entrepreneurial ecosystem, used by governments
- Find evidence that schooling (bundled with cash + desk) causally affects performance, while basic services apparently not
- Schooling adds value by increasing entrepreneurial capital
- Evidence of positive regional spillovers
- Taken together findings suggest policy adds value to entrepreneurial community

Future research

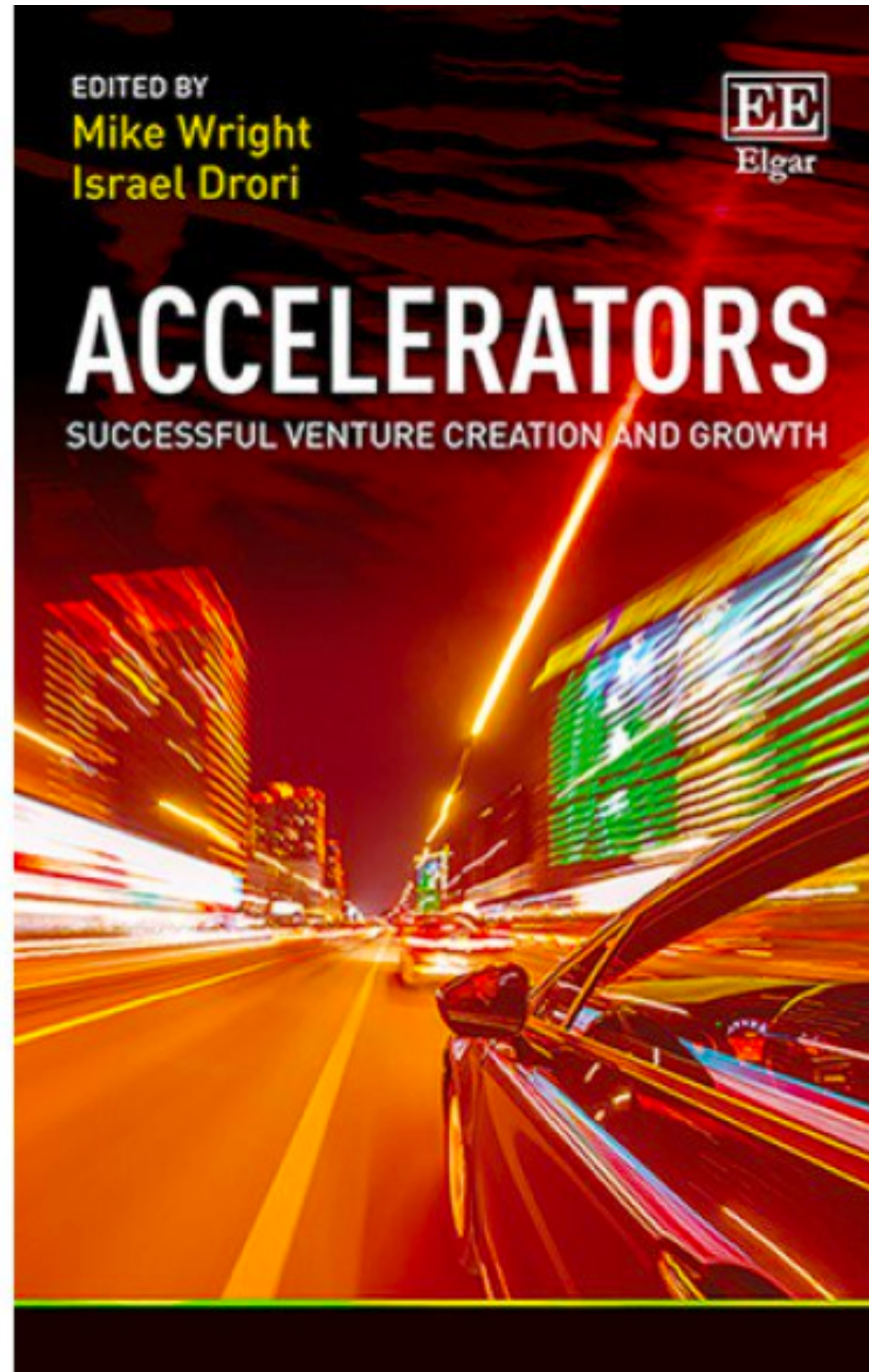
- Explore inside the black box of *entrepreneurship schooling*
- Do accelerators increase growth *and* failure?
- How does the acceleration experience affect new value creation?

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ACCELERATORS

SUCCESSFUL VENTURE CREATION AND GROWTH





Emprendimiento, Aceleradoras y Políticas de Innovación



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