

Appendix to “Learning from Feedback”

(for online publication)

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Table A.1: List of Programs

<i>Panel 1</i>												
<i>Competition Name</i>	<i>City</i>	<i>State</i>	<i>Years</i>	<i># unique ventures</i>	<i># unique judges</i>	<i># rounds per comp.</i>	<i>Judges score[⊕]</i>	<i>Judges rank</i>	<i>Dimension scores</i>	<i>Feedback</i>		
1M Cups Denver	Denver	CO	2014	6	2	1	Yes	No	Yes	Yes		
Arizona Innovation Challenge Fall	Phoenix	AZ	2012-2015	551	90	2	Yes	No	Yes	Yes		
Arizona Innovation Challenge Spring	Phoenix	AZ	2012-2015	640	87	2	Yes	No	Yes	Yes		
Angel Capital Summit	Denver	CO	2014-15	195	55	1	Yes	No	Yes	Yes		
BRF Entrepreneur Accelerator Program (EAP)	Shreveport	LA	2014	22	4	1	Yes	No	Yes	Yes		
CU CleanTech New Venture Challenge	Boulder	CO	2012-13	27	35	1	Yes	No	Yes	Yes		
Clean Energy Challenge	Chicago	IL	2013	50	55	2	Yes	No	Yes	Yes		
Cleantech Open: California	Redwood City	CA	2009-14	231	163	2	Yes	No	Yes	Only 2011		
Cleantech Open: North Central	Minneapolis	MN	2010-13	109	103	2	Yes	No	Yes	Only 2011		
Cleantech Open: Northeast	Boston	MA	2009-13	233	137	2	Yes	No	Yes	Only 2011		
Cleantech Open: Pacific Northwest	Portland	OR	2009-13	62	38	2	Yes	No	Yes	Only 2011		
Cleantech Open: Rocky Mountain	Denver	CO	2009-13	133	61	2	Yes	No	Yes	Only 2011		
Cleantech Open: South Central	Austin	TX	2011-13	11	12	2	Yes	No	Yes	Only 2011		
Cleantech Open: Southeast	Atlanta	GA	2011-13	24	37	2	Yes	No	Yes	Only 2011		
Colorado Capital Conference 2013	Denver	CO	2013	52	23	2	Yes	No	Yes	Yes		
Colorado Digital Health Challenge	Denver	CO	2014	33	46	2	Yes	No	Yes	Yes		
DOE Cleantech Business Plan Competition	Washington	D.C.	2013	6	5	2	Yes	No	Yes	Yes		
Energyize 2013	Snowbird	UT	2013	22	12	1	Yes	No	Yes	Yes		
Energy Security Prize, EIA Track	Washington	D.C.	2013	16	18	2	Yes	No	Yes	Yes		

<i>Panel 2</i>										
<i>Competition Name</i>	<i>City</i>	<i>State</i>	<i>Years</i>	<i># unique ventures</i>	<i># unique judges</i>	<i># rounds per comp.</i>	<i>Judges score[⊖]</i>	<i>Judges rank</i>	<i>Dimension scores</i>	<i>Feedback</i>
Harvard Business School New Venture Competition	Boston	MA	1999-2015	837	563	2 [‡]	Yes [⊙]	Yes	No	No
Illinois Clean Energy Student Challenge	Chicago	IL	2013	6	9	1	Yes	No	Yes	Yes
Imagine H2O Infrastructure Challenge	San Francisco	CA	2013-15	160	31	3	Yes	No	Yes	Yes
Innosphere Admissions	Fort Collins	CO	2013-15	32	46	1	Yes	No	Yes	Yes
MIT Clean Energy Prize	Cambridge	MA	2013-15	156	80	2-3 [^]	Yes	No	Yes	No
Missouri Clean Energy Student Challenge	St. Louis	MO	2013	14	9	1	Yes	No	Yes	Yes
OEDIT Advanced Industries Accelerator Energy and Natural Resources	Denver	CO	2015	16	7	1	Yes	No	Yes	Yes
Ohio Clean Energy Student Challenge	Cleveland	OH	2012-13	12	8	1	Yes	No	Yes	Yes
TransTech Energy Conference 2012	Morgantown	WV	2012	20	25	1	Yes	No	Yes	Yes
Massachusetts Clean Energy Center Catalyst Grant Program	Boston	MA	2012-15	250	134	2	Yes	No	Yes	No
Rice University Business Plan Competition	Houston	TX	2004-2015	480	694	3 [†]	No	Yes	No [‡]	No

Notes: [⊖]In the main data file, I have transformed scores to ranks (and all ranks to percentile ranks). Therefore, two ventures may have the same rank. [‡]First round done in panels of 4-8 ventures and 5-15 judges per panel, varies somewhat year to year (note: there is small finals for top three teams, all of which win a cash prize. Do not have data for this final round) [†]First round, challenge round, and semifinal rounds all "tracked" into panels (what RBPC calls "flights"). First round tracked by sector, then firms randomized across panels. Losers of first round go on to "Challenge" round. There is also pre-competition business plan stage. ^{*}Have in hand: 2012-16. Hopefully more coming. [‡]But used in pre-competition business plan stage, and I have those scores. [⊙] Main data file includes only ranks. I also have scores for HBS NVC. [^]Depends on year.

Table A.2: Rank and Learning Metrics Summary Statistics

<i>Panel 1: Venture's Overall Rank in Round/Panel</i>						
	N	Mean	Median	S.d.	Min	Max
Decile rank in round	6051	5.13	5	2.87	1	10
Decile rank in final round	1605	5.22	5	2.89	1	10
Decile rank in preliminary round	4394	5.1	5	2.87	1	10
Decile rank in final round among winners	407	4.57	5	2.84	1	10
Decile rank in final round among losers	1198	5.12	5	2.89	1	10
Decile rank in preliminary round among winners	1126	4.17	4	2.98	1	10
Decile rank in preliminary round among losers	3268	4.94	5	2.85	1	10
Dimension decile rank in round						
Team	4904	5.09	5	2.9	1	10
Financials	3691	5.07	5	2.9	1	10
Business Model	4024	5.08	5	2.89	1	10
Market Attractiveness	4024	5.09	5	2.9	1	10
Technology/Product	4848	5.09	5	2.89	1	10
Presentation	2799	5.04	5	2.93	1	10
Legal/IP/Regulatory	1537	4.94	5	2.89	1	10
Traction/Validation	1809	5.01	5	2.86	1	10
Risk/Cost Management	550	4.65	5	2.81	1	10
<i>Panel 2: Judge's Rank of Venture (Among Ventures Judge Scored)</i>						
	N	Mean	Median	S.d.	Min	Max
Judge decile rank in round	47065	4.75	5	2.83	1	10
Judge dimension quintile rank in round						
Team	27603	2.22	2	1.34	1	5
Financials	23070	2.21	2	1.32	1	5
Business Model	24127	2.24	2	1.34	1	5
Market Attractiveness	24167	2.25	2	1.33	1	5
Technology/Product	27346	2.26	2	1.34	1	5
Presentation	12644	2.26	2	1.37	1	5
Legal/IP/Regulatory	12779	2.15	2	1.34	1	5
Traction/Validation	13978	2.22	2	1.36	1	5
Risk/Cost Management	2776	2.17	2	1.26	1	5

Note: This table contains summary statistics about the percentile ranks used in analysis. Most are derived from raw scores, which I also transform into z-scores.

Table A.3: Company & Competition States

State	# competitions in state	# ventures located in state	State	# competitions in state	# ventures located in state
Arizona	8	665	Idaho		9
California	7	298	Kentucky		13
Massachusetts	34	1,146	Michigan		24
Colorado	16	250	Rhode Island		9
New York		85	Arkansas		14
Minnesota	2	46	North Carolina		14
Utah	3	48	Montana		7
Washington		40	Florida		16
Illinois		62	Hawaii		6
Nevada		28	Indiana		21
Texas	14	70	Missouri	1	19
Oregon	3	21	South Carolina		4
Wisconsin		28	Vermont		4
Connecticut		20	DC		4
Iowa		17	Kansas		9
Maryland		23	Alaska		2
Maine		8	Tennessee		10
New Jersey		14	New Hampshire		5
Ohio	2	28	South Dakota		3
Pennsylvania		26	Delaware		3
Virginia		20	Wyoming		5
North Dakota		7	Louisiana		13
New Mexico		10	West Virginia	1	2
Georgia		18	Mississippi		1
Oklahoma		4	Foreign		26

Note: This table lists the number of competitions and unique ventures by state. Companies that changed states are assigned their earliest state.

Table A.4: University Rankings

<i>Top Twenty U.S. Universities</i>		<i>Top Ten MBA Programs</i>		<i>Top Ten Universities for Computer Science</i>	
Rank	Name	Rank	Name	Rank	Name
1	PRINCETON	1	HARVARD	1	MIT
2	HARVARD	2	STANFORD	2	STANFORD
3	YALE	3	CHICAGO	3	HARVARD
4	COLUMBIA	4	UPENN	4	UC BERKELEY
5	STANFORD	5	MIT	5	TSINGHUA
6	CHICAGO	6	NORTHWESTERN	6	UT AUSTIN
7	MIT	7	UC BERKELEY	7	PRINCETON
8	DUKE	8	DARTMOUTH	8	UC SAN DIEGO
9	UPENN	9	YALE	9	UCLA
10	CALTECH	10	COLUMBIA	10	GEORGIA TECH
11	JOHNS HOPKINS				
12	DARTMOUTH				
13	NORTHWESTERN				
14	BROWN				
15	CORNELL				
16	VANDERBILT				
17	WASH ST LOUIS				
18	RICE				
19	NOTRE DAME				
20	UC BERKELEY				

Note: This table describes the university rankings used in analysis. Source: US News & World Report 2016 Rankings.

Table A.5: Representativeness of Sample

<i>Panel 1: Venture Sectors</i>			
	% ventures in data	% U.S. VC deals	% U.S. VC deal amt
Air/water/waste/agriculture	3.9%		
Biotech	4.8%	10.8%	12.9%
Clean tech/renewable energy	18.9%	3.3%	2.0%
Defense/security	1.7%		
Education	1.0%		
Energy (fossil)	1.6%		
Fintech/financial	1.4%	1.9%	5.4%
Food/beverage	2.3%		
Health (ex biotech)	7.2%	8.8%	6.1%
IT/software/web	37.2%	40.4%	39.8%
Manuf./materials/electronics	8.6%	7.4%	6.0%
Media/ads/entertainment	1.5%	9.6%	8.0%
Real estate	1.6%		
Retail/apparel/consumer goods	3.7%	6.8%	9.9%
Social enterprise	1.1%		
Transportation	3.6%		
<i>Panel 2: Venture States (top 20 states in data)</i>			
	% ventures in data	% U.S. VC deals	% U.S. VC deal amt
Massachusetts	35.5%	9.7%	9.6%
Arizona	20.6%	0.6%	0.2%
California	9.2%	40.6%	57.3%
Colorado	7.8%	2.0%	1.3%
New York	2.6%	10.6%	10.6%
Texas	2.2%	3.7%	2.0%
Illinois	1.9%	2.2%	1.9%
Utah	1.5%	1.3%	1.2%
Minnesota	1.4%	0.7%	0.6%
Washington	1.2%	2.6%	2.0%
Nevada	0.9%	0.1%	0.0%
Wisconsin	0.9%	0.5%	0.2%
Ohio	0.9%	1.6%	0.4%
Pennsylvania	0.8%	4.6%	1.1%
Michigan	0.7%	0.1%	0.6%
Maryland	0.7%	1.6%	1.5%
Oregon	0.7%	1.0%	0.4%
Indiana	0.7%	0.4%	0.1%
Connecticut	0.6%	1.3%	0.8%
Virginia	0.6%	1.7%	0.7%

Online Appendix

Note: This table compares the frequency of ventures in my sample with U.S. VC deals from the National Venture Capital Association's 2016 Yearbook.

Table A.6: Unconditional association between characteristics and success

<i>Panel 1</i>				
Dependent Variable:	Angel/VC series A investment ≥ 10 employees as of 8/2016			
	(1)	(2)	(3)	(4)
Founder student at round	-.023 (.047)	.016 (.028)	.029 (.042)	.043 (.028)
Founder top 10 college	.061* (.035)	.051*** (.018)	.035 (.037)	.032 (.022)
Founder has MBA	-.052 (.034)	-.0095 (.017)	-.061 (.038)	-.054*** (.018)
Founder top 10 MBA	-.034 (.041)	-.029 (.021)	.042 (.046)	.028 (.023)
Venture age > median	-.023 (.028)		.0091 (.025)	
Venture in VC hub state	.093** (.038)	.088*** (.018)	.057* (.034)	.09*** (.019)
Financing before round	.088** (.038)	.19*** (.028)	.15*** (.036)	.16*** (.023)
Venture incorp. at round	-.0049 (.036)	.021 (.018)	.033 (.032)	.07*** (.017)
Founder # jobs before round	.029*** (.0056)	.014*** (.0027)	.023*** (.0059)	.0091*** (.0026)
Founder age > median	-.02 (.029)		-.063** (.031)	
Venture social/ clean tech	-.14*** (.039)	-.13*** (.015)	-.024 (.047)	-.044** (.017)
Venture tech type IT/software	.14*** (.039)	.12*** (.021)	.068* (.038)	.074*** (.021)
Venture # team members	.03** (.014)	.0087 (.0063)	.035*** (.01)	.017*** (.0058)
N	1184	3346	1184	3346
R^2	.072	.1	.06	.061

Note: This panel contains the unconditional association of characteristics and success, using the OLS regression: $Y_i^{Post} = \alpha + \beta' \mathbf{C}_i + \varepsilon_{i,j}$ where \mathbf{C} is a vector of characteristics. Standard errors clustered by competition-round. Columns 2 and 4 have a much larger sample because they omit venture and founder age, which are not available for many ventures. *** indicates p-value < .01.

Panel 2

Dependent Variable:	Angel/VC series A investment	≥ 10 employees as of 8/2016
	(1)	(2)
Air/water/waste/agriculture	-	-
Biotech	.053 (.036)	-.012 (.047)
Clean tech/renewable energy	.026 (.026)	.026 (.027)
Defense/security	.14*** (.05)	.11* (.062)
Education	.17*** (.063)	.18** (.075)
Energy (fossil)	.12 (.073)	.11 (.071)
Fintech/financial	.073* (.039)	.23*** (.073)
Food/beverage	.12*** (.039)	.11** (.048)
Health (ex biotech)	.2*** (.04)	.12*** (.043)
IT/software/web	.24*** (.035)	.19*** (.035)
Manuf./materials/electronics	.18*** (.043)	.13*** (.043)
Media/ads/entertainment	.27*** (.065)	.11 (.069)
Real estate	.053 (.041)	-.0049 (.044)
Retail/apparel/consumer goods	.18*** (.046)	.081* (.046)
Social enterprise	-.03 (.085)	.14 (.1)
Transportation	.075** (.031)	.13*** (.047)
Competition f.e.	Y	Y
N	3519	3519
R^2	.12	.076

Note: This panel contains the unconditional association of venture sectors and success, using the OLS regression: $Y_i^{Post} = \alpha + \beta' Sector\ f.e._i + \gamma' Comp\ f.e._j + \varepsilon_{i,j}$. The base sector is “Air/water/waste/agriculture”. Standard errors clustered by competition-round. *** indicates p-value < .01.

Table A.7: Effect of Rank and Winning on Additional Outcomes

Dependent variable:	Angel/VC series A investment		Survival*		≥ 10 employees as of 8/2016		Acquired/IPO	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Won Round	.11*** (.022)	.15*** (.02)	.065*** (.027)	.14*** (.034)	.071*** (.027)	.12*** (.038)	.019* (.011)	.023*** (.0084)
Decile rank winners	-.009** (.0039)		-.0066 (.0043)		-.0048 (.0043)		-.0029* (.0017)	
Decile rank losers	-.011*** (.0019)		-.023*** (.0028)		-.017*** (.0023)		-.0011 (.001)	
Within-judge decile rank		-.0058*** (.00057)		-.01*** (.0036)		-.0087*** (.0032)		-.00047 (.00057)
Competition-round- Judge f.e.	Y N	N Y	Y N	N Y	Y N	N Y	Y N	N Y
N	6046	47065	6046	47066	6046	47065	6046	47065
R ²	.15	.11	.17	.12	.14	.083	.083	.047

Note: This table contains OLS regression estimates of the effect of winning and rank on indicators for various outcomes. * This measure for venture continuation is 1 if the venture had at least one employee besides founder on LinkedIn as of 8/2016. Errors clustered by competition-round or judge, depending on f.e. A smaller rank is better (1 is best decile, 10 is worst decile). Note that competition f.e. control for a specific date. All rounds included. *** indicates p-value<.01.

Table A.8: Effect of Rank and Winning on Subsequent External Financing Using Decile Rank Indicators

Dependent variable: Financing after round*

	(1)
Won Round	.09***
	(.021)
1st decile rank in round	-
2nd decile rank in round	-.065**
	(.026)
4th decile rank in round	-.059**
	(.025)
5th decile rank in round	-.081***
	(.027)
6th decile rank in round	-.078**
	(.034)
7th decile rank in round	-.096***
	(.027)
8th decile rank in round	-.12***
	(.029)
9th decile rank in round	-.13***
	(.029)
10th decile rank in round	-.18***
	(.029)
Award Amount (\$, 10,000s)	-.22***
	(.031)
Competition-round- panel f.e.	Y
N	6046
R ²	.17

Note: This table contains OLS regression estimates of the effect of winning, rank, and award (cash prize) on an indicator for whether the venture raised private investment after the competition, using variants of:

$$Y_i^{Post} = \alpha + \beta_1 WonRound_{i,j} + f(DecileRank_{i,j}) + \beta_2 AwardAmt + \gamma' \mathbf{f.e.}_{j'/k} + \delta' \mathbf{X}_i + \varepsilon_{i,j}$$

Errors clustered by competition-round\ . A smaller rank is better (1 is best decile, 10 is worst decile). * All private external investment after round. Note that competition f.e. control for a specific date. *** indicates p-value < .01.

Table A.9: Relationship between rank and observable quality

Sample restricted to losers of round

Dependent variable:	Founder attended top 10 college		Venture externally financed before competition		Venture incorporated by competition date	
Sample:	No-feedback		No-feedback		No-feedback	
	(1)	(2)	(3)	(4)	(5)	(6)
Low rank	-.0047* (.0026)	-.0047* (.0025)	-.025*** (.0023)	-.025*** (.0022)	-.012*** (.0031)	-.012*** (.003)
Low rank·Feedback		.0035 (.0026)		.000058 (.0038)		-.00032 (.0043)
Comp.-round- panel f.e.	Y	Y	Y	Y	Y	Y
N	2453	4513	2453	4513	2453	4513
R^2	.28	.3	.21	.15	.36	.66

Note: This table shows correlations between rank and characteristics expected to predict venture survival, observable at the time of the competition. “Low rank” is 1 if the venture’s rank is below median among losers. Errors clustered by competition-round. Competition-round fixed effects absorb the independent effect of feedback. *** indicates p-value<.01.

Table A.10: Information Provision Test Among Companies Participating in Multiple Competitions

<i>Panel 1: Summary Statistics of Variables used in T-Tests Below</i>									
	N	Mean	Median	S.d.	Min	Max			
Decile rank in 1st competition 1st round	521	5.06	5	2.81	1	10			
Judge score dispersion (uncertainty measure) in 1st competition 1st round	521	1.89	1.92	1.05	0	4.95			
Likelihood 2nd competition has feedback	521	0.7	1	0.46	0	1			

<i>Panel 2: T-tests of propensity to participate in subsequent competition with feedback</i>									
	Above median			Below median			Diff	2-tailed p-value	
	N	Mean	S.d.	N	Mean	S.d.			
Decile rank in 1st competition 1st round:									
Likelihood 2nd competition has feedback	238	0.69	0.46	283	0.70	0.46	-0.01	0.81	
Judge score dispersion (uncertainty measure) in 1st competition 1st round:									
Likelihood 2nd competition has feedback	224	0.70	0.46	297	0.70	0.46	0.00	0.92	

Note: This table tests whether founders with high information needs (below median rank or above median judge score dispersion) are more likely to participate in competitions with feedback. The sample is limited to ventures that participate in multiple competitions. I conduct t-tests for whether the proxies for uncertainty, measured in the first round of the first competition, are associated with a propensity to participate in a second competition that has feedback.

Table A.11: Out-of-Sample Summary Statistics for Exact Match

Sample: Losers of rounds only

Variables (not used in first stage)	<i>Panel 1: After Exact Matching</i>							
	Treated (Feedback)		Control (No Feedback)		Difference	t	p-value	
	N	Mean	N	Mean				
Venture IT/Software-based	1,050	0.494	1,050	0.494	0.000	0	1	
Venture in VC hub state	1,050	0.054	1,050	0.096	-0.042	-3.65	0	
Venture in same state as competition	1,050	0.550	1,050	0.837	-0.287	-14.99	0	
Venture age (years)	847	2.540	967	2.133	0.407	3.12	0.002	
Venture received financing before round	1,050	0.193	1,050	0.293	-0.100	-5.37	0	
Founder has MBA	1,050	0.086	1,050	0.056	0.030	2.64	0.008	
Founder age above median	255	0.776	198	0.838	-0.062	-1.65	0.1	
Founder attended top 10 college	1,050	0.026	1,050	0.034	-0.009	-1.15	0.25	
<i>Panel 2: Before Exact Matching</i>								
	Treated (Feedback)		Control (No Feedback)		Difference	t	p-value	
	N	Mean	N	Mean				
Venture IT/Software-based	1,075	0.487	3,061	0.452	0.035	1.96	0.05	
Venture in hub state (CA/MA/NY)	1,075	0.054	3,061	0.453	-0.400	-25.4	0	
Venture in same state as competition	1,075	0.548	3,061	0.514	0.034	1.9	0.057	
Venture age (years)	862	2.552	1,362	1.337	1.215	9.75	0	
Venture received financing before round	1,075	0.193	3,061	0.136	0.058	4.55	0	
Founder has MBA	1,075	0.085	3,061	0.361	-0.276	-17.82	0	
Founder age above median	263	0.760	1,515	0.481	0.280	8.56	0	
Founder attended top 10 college	1,075	0.025	3,061	0.156	-0.131	-12.89	0	

Note: This table contains summary statistics about out-of-sample covariate balance for the treated and control samples used in the exact matching analysis. The samples of above- and below-median losers were matched exactly sector (there are 16 sectors), competition year, student status, and company incorporation status. Note that IT/software, a larger category than the sectors, is exactly balanced after the match.

Table A.12: Propensity Score Matching Summary Statistics

Panel 1: After Propensity Score Matching

	Treated (Feedback)		Control (No Feedback)		Difference	t	p-value
	N	Mean	N	Mean			
Venture incorporated	1,064	0.866	2,701	0.866	0.000	0	1
Venture received financing before round	1,064	0.250	2,701	0.253	-0.003	-0.13	0.899
Founder is student	1,064	0.027	2,701	0.029	-0.002	-0.17	0.868
Air/water/waste/ag	1,064	0.023	2,701	0.023	0.000	0	1
Biotech	1,064	0.061	2,701	0.058	0.003	0.23	0.816
Clean tech/renewable	1,064	0.204	2,701	0.204	0.000	0	1
Defense/security	1,064	0.014	2,701	0.018	-0.005	-0.66	0.51
Education	1,064	0.006	2,701	0.006	0.000	0	1
Energy (fossil)	1,064	0.011	2,701	0.012	-0.002	-0.26	0.795
Fintech/financial	1,064	0.003	2,701	0.002	0.002	0.58	0.564
Food/beverage	1,064	0.020	2,701	0.018	0.002	0.2	0.84
Health (ex biotech)	1,064	0.053	2,701	0.053	0.000	0	1
Mobile/IT/software	1,064	0.453	2,701	0.456	-0.003	-0.11	0.912
Manuf/materials/electronics	1,064	0.104	2,701	0.101	0.003	0.18	0.855
Media/ads/entertainment	1,064	0.002	2,701	0.002	0.000	0	1
Apparel/consumer goods	1,064	0.014	2,701	0.008	0.006	1.07	0.283

Panel 2: Before Propensity Score Matching

	Treated (Feedback)		Control (No Feedback)		Difference	t	p-value
	N	Mean	N	Mean			
Venture incorporated	1,075	0.464	3,061	0.367	0.098	34.94	0
Venture received financing before round	1,075	0.194	3,061	0.151	0.043	3.19	0.001
Founder is student	1,075	0.022	3,061	0.218	-0.196	-15.15	0
Air/water/waste/ag	1,075	0.030	3,061	0.044	-0.014	-1.97	0.049
Biotech	1,075	0.086	3,061	0.033	0.053	6.92	0
Clean tech/renewable	1,075	0.133	3,061	0.236	-0.102	-7.03	0
Defense/security	1,075	0.028	3,061	0.010	0.018	4.01	0
Education	1,075	0.007	3,061	0.009	-0.002	-0.6	0.547
Energy (fossil)	1,075	0.010	3,061	0.019	-0.008	-1.79	0.074
Fintech/financial	1,075	0.005	3,061	0.012	-0.008	-2.08	0.038
Food/beverage	1,075	0.015	3,061	0.025	-0.010	-1.9	0.058
Health (ex biotech)	1,075	0.040	3,061	0.100	-0.059	-5.96	0
Mobile/IT/software	1,075	0.484	3,061	0.302	0.182	10.67	0
Manuf/materials/electronics	1,075	0.123	3,061	0.066	0.057	5.74	0
Media/ads/entertainment	1,075	0.004	3,061	0.009	-0.005	-1.65	0.099
Apparel/consumer goods	1,075	0.011	3,061	0.043	-0.032	-4.84	0

Note: This table contains summary statistics before and after propensity score matching across feedback and no-feedback groups within losers. The samples were also matched on year, which I do not report. There are three additional sectors that I did not match on as there were too few observations (transportation, social enterprise, and real estate).

Table A.13: Effect of Negative Feedback with Competition-type Interactions

Panel 1: Competition signal quality measures

Dependent variable: Survival*

	(1)
Low rank·Feedback	-.095** (.038)
Low rank	-.047** (.019)
Held at university·Feedback	-.21 (.19)
Held at university	.04 (.042)
# ventures participating·Feedback	-.00061 (.00071)
# ventures participating	.00015 (.00067)
# judges participating·Feedback	-.0011 (.0011)
# judges participating	-.00029 (.00023)
Indicators for 9 geographic regions (Census divisions)·Feedback	Y
Indicators for 9 geographic regions (Census divisions) Feedback	Y .26*** (.073)
Year f.e.	Y
N	4136
R^2	.076

Note: This table shows estimates of the effect of negative feedback, from Equation 2, where feedback is also interacted with characteristics likely to be associated with participant diversity, signal quality, and survival probability. Sample restricted to losers of round, all rounds included. *** indicates p-value<.01.

Panel 2: Competition participant success likelihood measures

Dependent variable: Survival*

	(1)
Low rank·Feedback	-.098*** (.038)
Low rank	-.047** (.02)
Share founders attended top 10 colleges·Feedback	.81 (.74)
Share founders attended top 10 colleges	-.029 (.11)
Share ventures received prior financing·Feedback	-.11 (.3)
Share ventures received prior financing	.69*** (.24)
Share ventures incorporated at round·Feedback	-.28** (.13)
Share ventures incorporated at round	-.043 (.063)
Feedback	.32*** (.12)
Year f.e.	Y
N	4136
R^2	.078

Note: This table shows estimates of the effect of negative feedback, from Equation 2, where feedback is also interacted with characteristics likely to be associated with participant diversity, signal quality, and survival probability. Sample restricted to losers of round, all rounds included. *** indicates p-value<.01.

Panel 3: Competition participant diversity measures

Dependent variable: Survival*

	(1)
Low rank·Feedback	-.09**
	(.039)
Low rank	-.056***
	(.021)
# sectors (out of 16) represented by ventures ·Feedback	-.016
	(.012)
# sectors (out of 16) represented by ventures	.0013
	(.006)
Share ventures software/web/IT·Feedback	-.13
	(.18)
Share ventures software/web/IT	.021
	(.085)
Share ventures clean energy·Feedback	-.5*
	(.28)
Share ventures clean energy	.05
	(.064)
Feedback	.38**
	(.17)
Year f.e.	Y
N	3796
R^2	.071

Note: This table shows estimates of the effect of negative feedback, from Equation 2, where feedback is also interacted with characteristics likely to be associated with participant diversity, signal quality, and survival probability. Sample restricted to losers of round, all rounds included. *** indicates p-value<.01.

Panel 4: Founder success likelihood measures

Dependent variable: Survival*

	(1)
Low rank·Feedback	-.067*
	(.035)
Low rank	-.05**
	(.02)
Venture incorporated at round ·Feedback	-.072
	(.061)
Venture incorporated at round	.17***
	(.025)
Venture received prior financing·Feedback	-.091**
	(.045)
Venture received prior financing	.34***
	(.034)
Founder attended top 10 college·Feedback	.14*
	(.079)
Founder attended top 10 college	.0024
	(.026)
Founder attended top 20 PhD·Feedback	-.43***
	(.12)
Founder attended top 20 PhD*	.045
	(.041)
Founder student at round·Feedback	.0081
	(.086)
Founder student at round	.096***
	(.025)
Feedback	.14**
	(.063)
Year f.e.	Y
N	3765
R^2	.13

Note: This table shows estimates of the effect of negative feedback, from Equation 2, where feedback is also interacted with characteristics likely to be associated with participant diversity, signal quality, and survival probability. Sample restricted to losers of round, all rounds included. *University ranks in top 20 according to US News & World 2016. *** indicates p-value<.01.

Table A.14: Effect of Negative Feedback on Venture Continuation within Cleantech Open

Sample restricted to losers of round in the Cleantech Open Competitions 2010-12

Dependent variable: Survival*

Sample:	2010-12		All years		2010-12	All years
	(1)	(2)	(3)	(4)	(5)	(6)
					Logit	
Low rank·Feedback	-0.13 (.081)	-.11** (.053)	-.13* (.069)	-.11** (.05)	-.65* (.39)	-.6* (.32)
Low rank		-.061 (.051)	-.064*** (.025)	-.056 (.037)	-.055*** (.02)	-.3 (.19)
Feedback		.072 (.092)	-.04 (.072)	.11 (.086)	.024 (.068)	.33 (.43)
Venture controls [†]	Y	Y	Y	Y	Y	Y
Judge f.e.	N	Y	N	Y	N	N
N	575	2601	739	3247	571	735
R^2	.15	.3	.12	.26		
Pseudo- R^2					.11	.092

Note: This table shows estimates of the effect of negative feedback; specifically, the effect of a below-median rank among losers when losers learn their ranks, (“Feedback”), relative to competitions where they do not learn their ranks. The sample is limited to the Cleantech Open Competition. Columns 1 and 2 further limit the sample to the years 2010-2012. Feedback only occurred in 2011. Models are OLS in columns 1-4 and logit in columns 5-6. They are variants of:

$$Y_i^{Post} = \alpha + \beta_1 (\mathbf{1} \mid LowRank_{i,j}) (\mathbf{1} \mid StructuredFeedback_j) + \beta_2 (\mathbf{1} \mid LowRank_{i,j}) + \beta_3 (\mathbf{1} \mid StructuredFeedback_j) + \gamma' \mathbf{f.e.}_{j'/k} + \delta' \mathbf{X}_i + \varepsilon_{i,j} \text{ if } i \in Losers_j$$

“Low rank” is one if the venture’s rank is below median among losers, and 0 if it is above median among losers. * This measure for venture continuation is 1 if the venture had at least one employee besides founder on LinkedIn as of 8/2016. Errors clustered by competition-round or judge, depending on fixed effects. Feedback varies by event, so competition-round f.e. are not used. [†]Includes sector indicator variables, whether the company is incorporated, and whether the founder is a student. *** indicates p-value<.01.

Table A.15: Effect of Negative Feedback in Subsamples

Dependent Variable: Survival*	Founders with MBAs	Ventures in VC hub state [†]	Founder is student
Sample restricted to:	(1)	(2)	(3)
Below median rank among losers: Feedback	-.13*	-.15**	-.49***
	(.07)	(.067)	(.1)
Below median rank among losers	-.0077	-.062***	-.02
	(.024)	(.021)	(.042)
Feedback	.42	.63*	.61***
	(.29)	(.34)	(.059)
Year f.e.	Y	Y	Y
N	9110	8221	712
R^2	.21	.23	.064

Note: This table shows estimates of the effect of negative feedback as in Table 6, but with alternative samples. * Survival is 1 if the venture had ≥ 1 employee besides founder on LinkedIn as of 8/2016. [†]Includes sector indicator variables, student status and company incorporation statuses. *** indicates p-value<.01. [†]Venture state is California, New York, or Massachusetts. *** indicates p-value<.01.

Table A.16: Leave-one-out leniency measure predictive power

Dependent variable:	Judge's score	Survival*	Financing after round	≥ 10 employees as of 8/2016	Acquired/IPO	Survival*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Leave one out leniency (L_{ij})	2.2*** (.075)	2.1*** (.081)	-.06* (.032)	.0069 (.027)	-.043* (.025)	-.0031 (.012)	-.13*** (.05)
Low rank·Feedback· L_{ij}							.017 (.088)
Low rank·Feedback							-.084 (.062)
Feedback· L_{ij}							.045 (.09)
Low rank· L_{ij}							.0028 (.054)
Low rank							-.067 (.045)
Feedback							-.036 (.057)
Venture controls	N	N	N	N	N	N	Y
Year f.e.	N	N	N	N	N	N	Y
Competition-round-panel f.e.	Y	Y	Y	Y	Y	Y	N
N	20517	14514	5412	5412	5412	5412	3638
R^2	.86	.85	.14	.12	.12	.084	.091

Note: This table shows leniency scores predict real scores, weakly predict success outcomes, and do not interact with feedback. The leave-one-out leniency measure is calculated as: $L_{ij} = \frac{1}{n_j - 1} \left(\sum_{k=1}^j S_k - S_i \right)$. The sample is limited to * This measure for venture continuation is 1 if the venture had at least one employee besides founder on LinkedIn as of 8/2016. Errors clustered by competition-round. *** indicates p-value < .01.

Table A.17: Unconditional association between characteristics and venture abandonment/founding new venture

Sample:	All		Only founders that abandoned original venture	
Dependent variable:	Founder/CEO of subsequent venture [†]		# days to abandon	
	(1)	(2)	(3)	(4)
Venture incorp. at round	-.12*** (.023)	-.035 (.023)	-37 (25)	21 (25)
Financing before round	-.1*** (.018)	-.081*** (.017)	-43 (31)	-8.9 (32)
Venture tech type IT/software	-.01 (.021)	-.01 (.02)	14 (30)	16 (30)
Venture social/ clean tech	.057** (.023)	.07*** (.023)	-85*** (25)	-74*** (26)
Venture in VC hub state	-.061*** (.022)	-.065*** (.021)	-46 (36)	-24 (37)
Founder student at round	.03 (.047)	.031 (.047)	-39 (52)	-51 (54)
Founder age > median at round	.015 (.017)	.013 (.017)	43* (22)	40* (22)
Founder # jobs before round	.011*** (.0019)	.012*** (.0018)	-74 (3.3)	.36 (3.3)
Founder top 10 college	-.027 (.021)	-.024 (.02)	9.1 (21)	3.1 (21)
Founder top 10 MBA	.034 (.028)	.033 (.027)	-126*** (38)	-138*** (43)
Founder has MBA	.063*** (.02)	.043** (.022)	89** (36)	70* (37)
Founder has PhD	-.018 (.02)	.0067 (.02)	86** (37)	106*** (38)
Competition f.e.	Y	N	Y	N
Competition-year f.e.	N	Y	N	Y
Year f.e.	N	N	N	N
N	3133	3133	1495	1495
R ²	.13	.23	.086	.16

Note: This panel contains the unconditional association of characteristics and outcomes, using the OLS regression: $Y_i^{Post} = \alpha + \beta' \mathbf{C}_i + \varepsilon_{i,j}$ where \mathbf{C} is a vector of characteristics. [†]Effort was made to identify venture name changes to ensure that the “new” venture is not simply a name change; 18% of ventures in the sample changed their names. Standard errors clustered by competition-round. *** indicates p-value < .01.

Table A.18: Effect of Negative Feedback Responsiveness on Serial Entrepreneurship

Sample restricted to losers of round		
Dependent variable: Founder or CEO of subsequent venture [‡]		
	(1)	(2)
Below loser median rank·Feedback· Abandoned fast*	-.12 (.13)	
Below loser median rank·Feedback	-.0098 (.014)	
Feedback· Abandoned fast	.28** (.11)	
Below loser median rank· Abandoned fast	-.032 (.036)	
Abandoned fast	.36*** (.028)	.37*** (.021)
Below loser median rank	.019 (.012)	
Feedback	-.014 (.015)	
Venture controls [†]	Y	Y
Year f.e.	Y	Y
N	5100	5100
R ²	.26	.25

Note: This table examines whether being responsive to negative feedback (abandoning quickly) is associated with subsequently founding a new venture. The dependent variable is 1 if the founder both abandoned his original venture and founded a new venture. All models OLS variants of Equation 2. *Abandoned fast is 1 if, conditional on abandoning enterprise, it was abandoned in a below-median number of days. Errors clustered by competition-round or judge, depending on fixed effects. [†]Includes sector indicator variables, whether the company is incorporated, and whether the founder is a student. Feedback varies by event, so competition-round f.e. are not used. *** indicates p-value<.01.

Table A.19: Correlations among Outcomes, Venture Characteristics, and Founder Characteristics

Panel 1: Outcomes

	Financing after round	Angel/seed/VC series A investment after round	Has ≥ 2 employees as of 8/2016	Has ≥ 3 employees as of 8/2016	Has ≥ 10 employees as of 8/2016	Operating as of 9/2016
Financing after round	1.00					
Angel/seed/VC series A investment after round	0.75	1.00				
Has ≥ 2 employees as of 8/2016	0.37	0.31	1.00			
Has ≥ 3 employees as of 8/2016	0.38	0.32	0.91	1.00		
Has ≥ 10 employees as of 8/2016	0.34	0.31	0.69	0.76	1.00	
Operating as of 9/2016	0.32	0.26	0.52	0.47	0.37	1.00
Acquired/IPOd as of 9/2016	0.24	0.13	0.09	0.09	0.12	0.11

Panel 2: Ventures

	Financing before round	Incorporated at round	Venture age at first competition (years)	# founders/team members at first competition	Tech type IT/software, not hardware	Hard-to-fund sector [†]	% venture owned by presenting team at round
Incorporated at round	0.06	1.00					
Venture age at first competition (years)	0.14	-0.01	1.00				
# founders/team members at first competition	-0.17	0.09	-0.20	1.00			
Tech type IT/software, not hardware	0.08	-0.04	-0.11	-0.20	1.00		
Hard-to-fund sector [†]	0.05	0.24	-0.23	0.25	-0.48	1.00	
% venture owned by presenting team at round	0.03	-0.18	-0.06	-0.03	0.18	-0.17	1.00
Possesses formal IP rights at round	-0.07	0.02	-0.19	0.04	-0.13	0.19	0.11

Panel 3: Founders (Venture Leader - One Per Venture)[†]

	Executive title after	Founded venture after	Age	# total jobs	# jobs before	# lo-cations	Degree from H/S/M	Top 20 college	MBA from top 10	Master's	PhD
Founded venture after round	0.49	1.00									
Age (years) at event (college graduation year-22)	-0.12	-0.10	1.00								
# total jobs	0.18	0.15	-0.01	1.00							
# jobs before round	-0.13	-0.10	0.17	0.71	1.00						
Number of locations	0.05	0.02	-0.01	0.55	0.49	1.00					
Any degree Harvard, Stanford, MIT	0.13	0.08	-0.23	0.08	-0.07	0.06	1.00				
Top 20 college	0.08	0.06	-0.13	0.13	-0.01	0.01	0.34	1.00			
Has MBA	0.11	0.07	-0.15	-0.05	-0.14	-0.04	0.45	0.08	1.00		
Has MBA from top 10	0.12	0.02	-0.15	-0.01	-0.11	0.03	0.74	0.25	0.66	1.00	
Master's	0.00	0.03	-0.01	0.05	0.02	0.05	-0.07	-0.01	-0.20	1.00	
Has PhD	0.06	-0.01	-0.06	0.08	-0.01	0.05	-0.12	-0.05	-0.33	0.11	1.00
Has CS degree from top 10 CS univ	-0.01	-0.06	-0.04	0.04	0.04	0.05	0.17	0.11	-0.05	0.07	0.13

Note: This table contains correlations of variables used in analysis.[†]Firms in the following sectors are categorized as being in a capital intensive/difficult-to-finance sector: social impact, energy (clean tech and fossil), manufacturing, air/waste, transportation, education, and biotech.

Table A.20: Effect of Positive Feedback (Effect of above-median rank within winners when founders informed of rank, relative to above-median rank winners *not* informed of rank)

Sample restricted to winners of round

Dependent variable: Survival*

	(1)	(2)	(3)	(4)	(5)
High rank· Feedback	.0095 (.061)	-.041 (.073)	.1** (.04)	.11** (.047)	.12** (.052)
High rank	.092** (.046)	.08 (.05)	-.018 (.025)	-.0046 (.026)	-.045 (.037)
Feedback	.22*** (.062)	.26*** (.071)	.42*** (.11)	.38* (.19)	.087 (.28)
Round type	All	Prelim.	All	Prelim.	All
Venture controls [†]	N	N	N	N	Y
Year f.e.	Y	Y	N	N	N
Judge f.e.	N	N	Y	Y	Y
N	1460	1099	12054	7818	5376
R^2	.065	.06	.21	.2	.42

Note: This table shows estimates of the effect of positive feedback. That is, the effect of a above-median rank among winners when winners learn their ranks, relative to competitions where they do not learn their ranks. Errors clustered by competition-round or judge, depending on fixed effects. Feedback varies by event, so competition-round f.e. are not used. * Survival is 1 if the venture had ≥ 1 employee besides founder on LinkedIn as of 8/2016. [†]Includes sector indicator variables, student status and company incorporation statuses. *** indicates p-value<.01.

Table A.21: Judge Uncertainty Association with Success (All rounds)

Dependent variable:	Angel/VC series A investment
	(2)
Std dev of judge ranks above median	.018** (.0077)
Judge/judge company invested	.51*** (.1)
Decile rank in round	-.013*** (.0023)
Won Round	.085*** (.017)
Competition-round- panel f.e.	Y
N	4226
R^2	.084

Note: This table contains OLS regression estimates of the relationship between the standard deviation of judge ranks, across unique judges that scored a specific venture, and that venture's outcomes. I use variants of:

$$Y_{ij} = \alpha + \beta_1 StdDevJudgeScores_i + \beta_2 (\mathbf{1} | WonRound_{i,j'}) + f(DecileRank_{i,j'}) + \varepsilon_{i,j'}$$

Errors clustered by competition-round. Note that competition f.e. control for a specific date. *** indicates p-value < .01.

Table A.22: Instrumenting for score variation with leave-one-out leniency measures (first stage and naive second stage)

Dependent variable:	Standard deviation of venture's scores [†]				Survival*	
	(1)	(2)	(3)	(4)	(5)	(6)
Leave one out leniency (L_{ij})						
High variation in L_{ij} ($V_{i,\sigma}^{high}$)	2.5*** (.96)	2.5*** (.88)				
Extreme values of L_{ij} ($V_{i,\sigma}^{ext}$)			2.4** (1.1)	2.4** (1)		
Low rank-Feedback· $V_{i,\sigma}^{high}$.023 (.32)	
Low rank-Feedback· $V_{i,\sigma}^{ext}$.063 (.23)
6 individual effects and interactions	N	N	N	N	Y	Y
Venture controls	N	N	N	N	Y	Y
Year f.e.	N	Y	N	Y	Y	Y
Competition-round-panel f.e.	N	N	N	N	N	N
N	3770	3770	3943	3943	3810	4087
R^2	.023	.039	.022	.038	.041	.047
First stage F-test [±]	28	31	14	16		

Note: This table shows that receiving “randomly” noisier feedback by virtue of having high variation in judge leniency does not seem to affect responsiveness. First, columns 1-2 demonstrate that the leniency measure does predict the judge’s score. This leave-one-out leniency measure is calculated as: $L_{ij} = \frac{1}{n_j-1} \left(\sum_{k=1}^j S_k - S_i \right)$. Columns 3-6 show that variation in leniency predict the standard deviation of judge scores. Finally, in columns 7-8, I use the leave-one-out measures as naive instruments, and interact them with the effect of receiving negative feedback. [†]Standard deviation of within-panel judge decile ranks of a venture. $V_{i,\sigma}^{high}$ is the venture leave-one-out leniency variation based on propensity to give highest score. $V_{i,\sigma}^{low}$ is the venture leave-one-out leniency variation based on propensity to give lowest score. $V_{i,\sigma}^{ext}$ is the venture leave-one-out leniency variation based on four most extreme judges. [±]F-statistic for the excluded instrument (standard deviation of scores) being significantly different from zero. “Low rank” is one if the venture’s rank is below median among losers, and 0 if it is above median among losers. Regressions are OLS. * This measure for venture continuation is 1 if the venture had at least one employee besides founder on LinkedIn as of 8/2016. Errors clustered by competition-round. *** indicates p-value<.01.

Figure 1: Probability venture had at least 10 employees by decile rank around cutoff

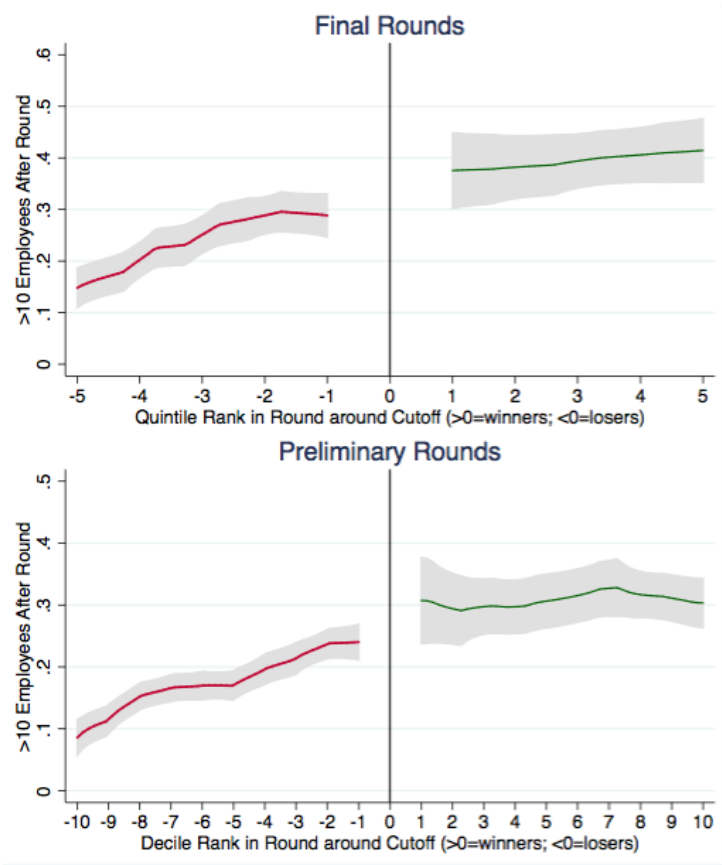
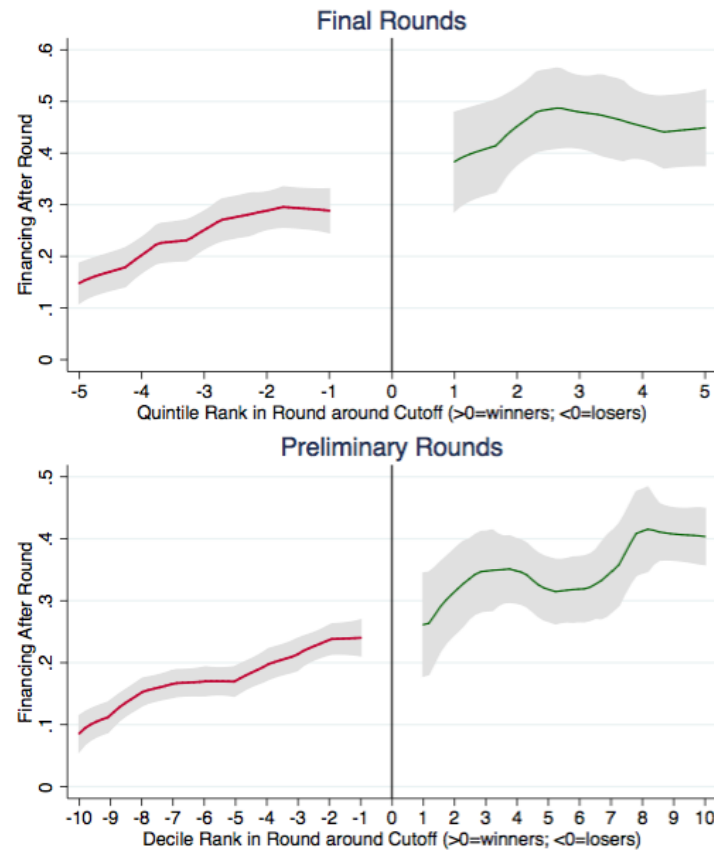


Figure 2: Probability venture raised external finance after round (rank 1 is best)



Note: The above figures show the probability of subsequent financing by venture percentile rank (top) and z-score (bottom) within a round. Local polynomial with Epanechnikov kernel using Stata's optimal bandwidth; 95% confidence intervals shown.

Figure 3: Distributions of Pre-Round Venture Characteristics

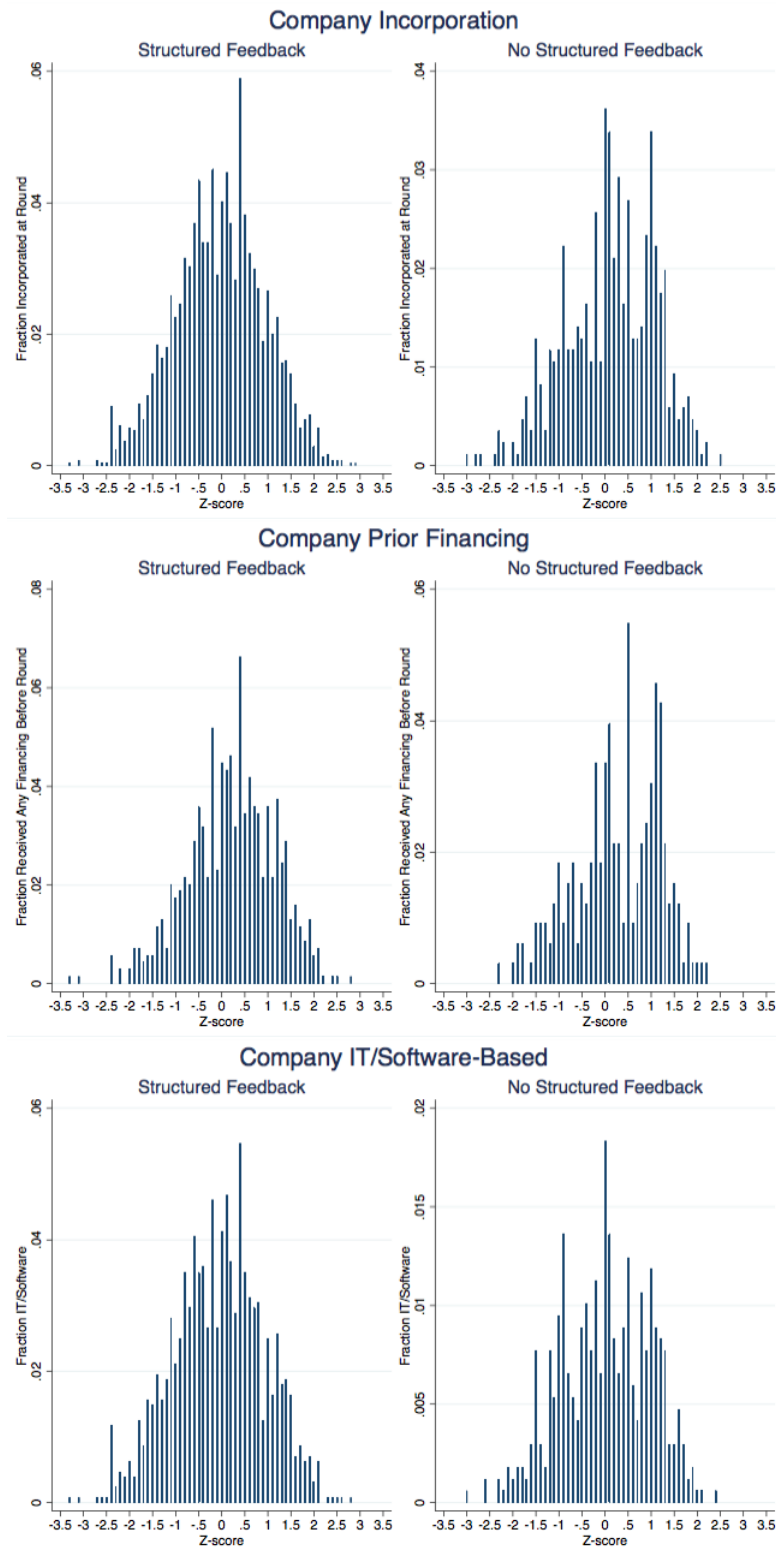
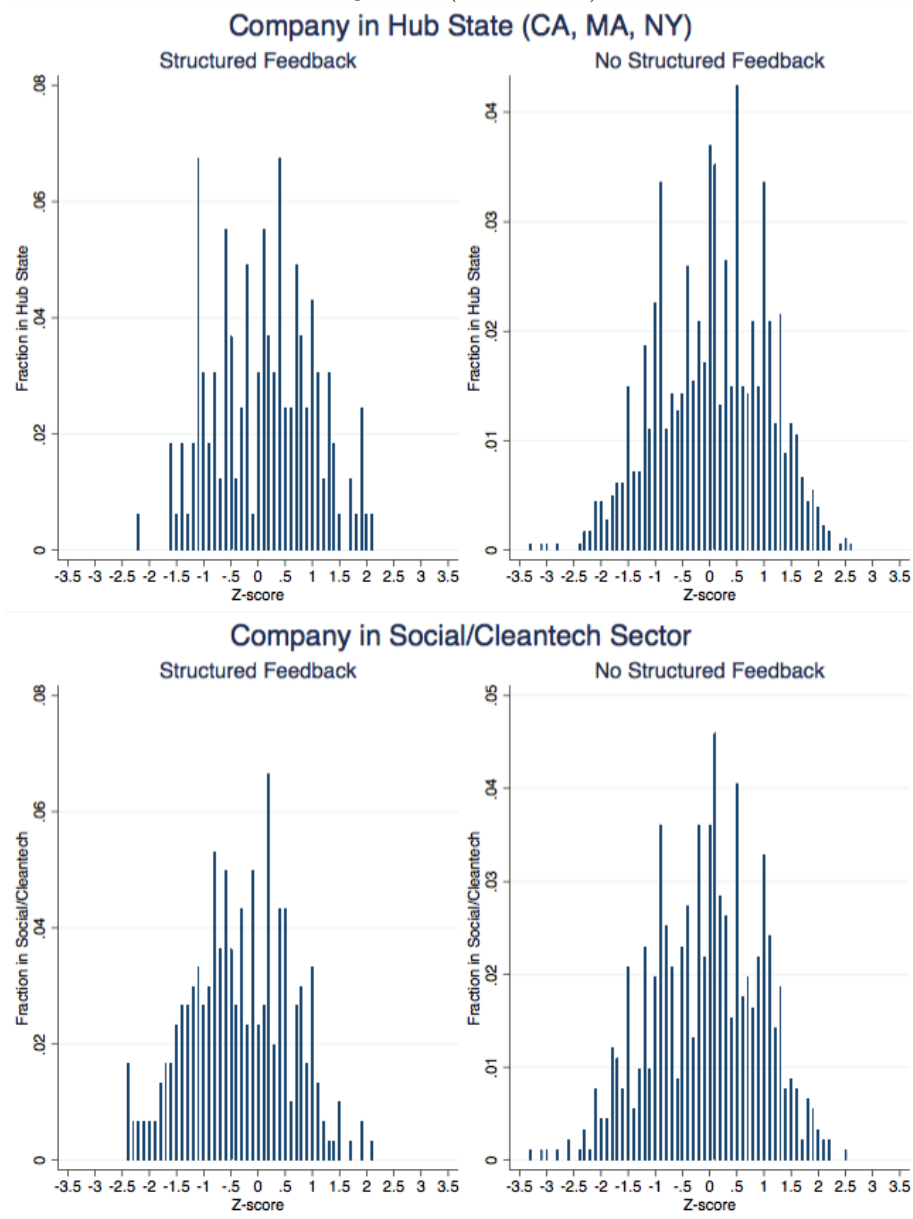


Figure 1 (continued)



Note: This figure shows spikes representing the fraction of all firms within 0.1 z-score bandwidths. For example, for variable X_i , the bar height for a z-score band of z in feedback competitions is: $\frac{\sum_{z_i, SF} Inc_i}{\sum_{SF} Inc_i}$.

Figure 4: Distributions of Pre-Round Founder Characteristics

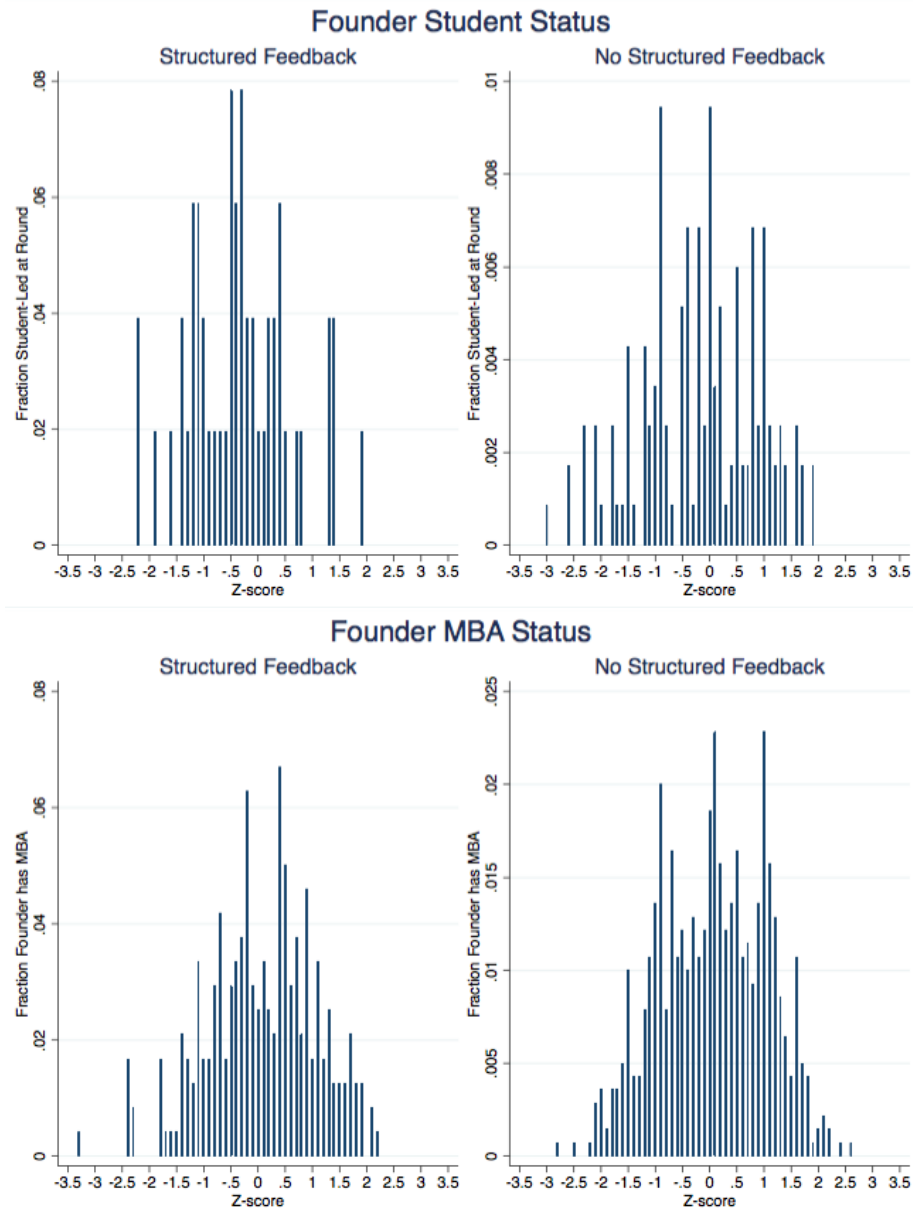
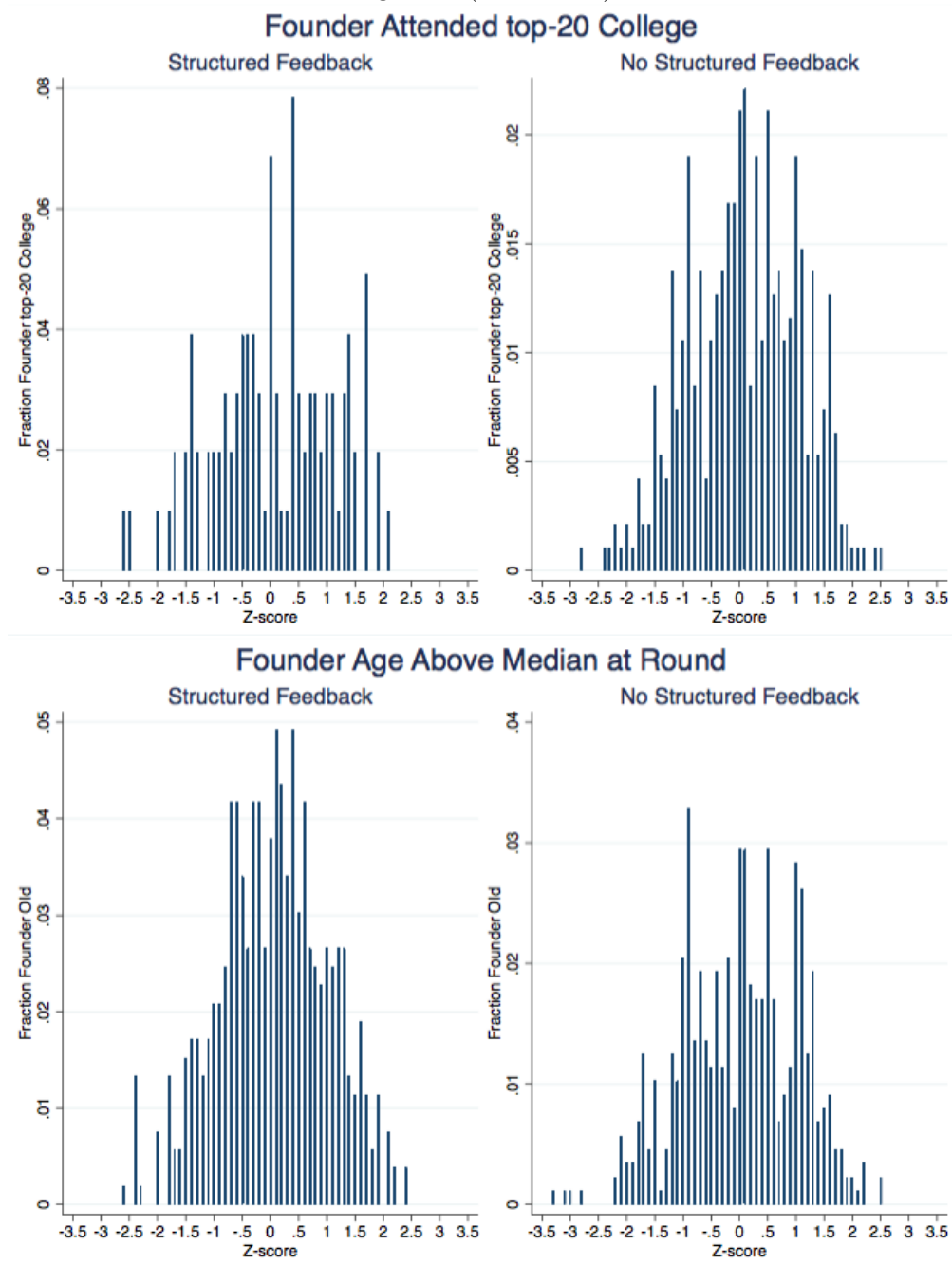


Figure 2 (continued)



Note: This figure shows spikes representing the fraction of all firms within 0.1 z-score bandwidths. For example, for variable X_i , the bar height for a z-score band of z in feedback competitions is: $\frac{\sum_{z, SF} Inc_i}{\sum_{SF} Inc_i}$.