

Does Gender Matter in Choosing Startup Investors? A National Field Experiment

The Law and Finance of Private Equity and Venture Capital

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June 22, 2023

Matching Funding with Human Capital



- Startups are a significant source of innovation and economic disruption, relying in large part on private equity
- Capital raising progresses in rounds, where new ventures secure funding from Angels and VCs in exchange for ownership and control
- In this two-sided matching process, investors pick startups based on the founding team's perceived ability (Bernstein et al., 2017) with other factors like the business idea or attention from other investors also playing a role (Gomez-Mejia et al., 1990)
- Founders choose investors based on criteria like reputation and expertise (Sørensen 2007) and the depth of their network (Hsu, 2004)

Bias Against Female Investors?



- Startups are essential job growth and wealth drivers but often exhibit severe gender inequality (Phillips, 2005; Yang and Aldrich, 2014)
- Anecdotal accounts, especially in Silicon Valley, use terms such as "bro culture," "boys club," and "Brotopia" to describe components of startup culture (e.g., Chang, 2019)
- Are these isolated events or data points alluding to a larger picture?
- On the one hand, as gender is orthogonal to the investor's ability, it is plausible to assume it will not play a meaningful role in the matching exercise
- On the other hand, other forces like:
 - Homophilic tendencies (Kossinets and Watts, 2009; Ertug et al., 2022)
 - Under-representation of female investors and,
 - Role Congruity Theory (Eagly and Carli 2003)
- Suggests that founders could harbor bias against female investors, causing them to eschew her from investment opportunities



- Our study test whether:
 - Startups demonstrate a preference for male investors over female investors
 - These preferences are stronger in Tech Hubs
 - These preferences stem from perception of female competency, especially in situations of role (in)congruity
- This leads to three hypotheses:
 - **H1: When faced with an unsolicited funding opportunity, startups prefer male investors**
 - **H2: When faced with an unsolicited funding opportunity, startups in a tech hub will prefer male investors more than their counterparts across the country**
 - **H3: When faced with an unsolicited funding opportunity from a professionally qualified investor, startup engagement will improve for the male and decline for the female investor**



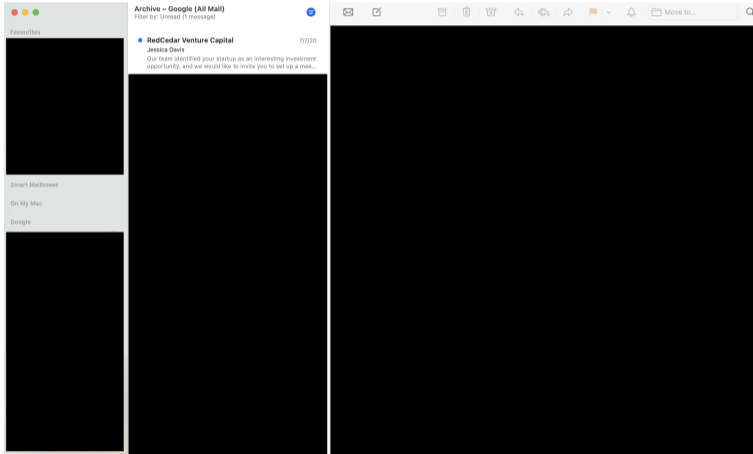
- Using CrunchBase dataset, we filter for startups incorporated in the US (about 100,000) with valid and 'Cleaned' email addresses formed from 2005 onwards, leaving us with 40,572 startups
- Cleaning our email prior to the experiment is a crucial step, ensuring a low bounce rate
- Using deception, approved by our IRB, we build a series of fake websites on WiX and using an SEO procedure to ensure they are among the top hits when typing selected words on search engines
- Then, we randomly assign the startups to receive an email from:
 - Male or female investor
 - Angel or VC
 - Totting professional credentials (JD, CPA, MD) or not



- Sending emails on July 2020 outside working hours (both the East and West coast) to minimize violation of the SUTVA assumption
- Using a pull request for a 1x1 pixel image, WiX's technology records whether the email was:
 - Sent
 - Opened
 - Clicked on (via a hyperlinked in the email's body)
- WiX's platform also enables further correspondence between sender and receiver on its platform, which caused us to receive hundreds of messages wanting to set up meetings with our fake investors
- After sending the emails, we wait two weeks and download the results

Research Design

Email label, as seen from recipient's perspective



Research Design

Email body, with hyperlinks and a hidden 1x1 pixel varying the sender's name



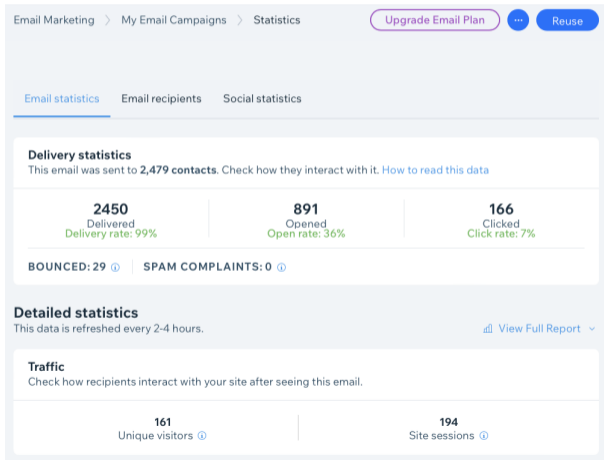
Jessica Davis

Our team identified your startup as an interesting investment opportunity, and we would like to invite you to set up a meeting with us at one of our offices or online. We are looking to extend our portfolio companies and will be taking in pitches on a rolling basis. Please feel free to read about our firm, and contact us either via email or through the 'Contact us' option on the website.



RedCedar Team

[Check out our website](#) ↪



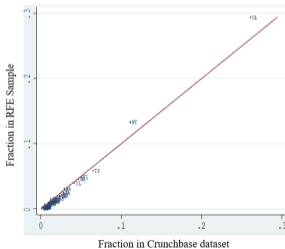
Summary Statistics and Random Sampling



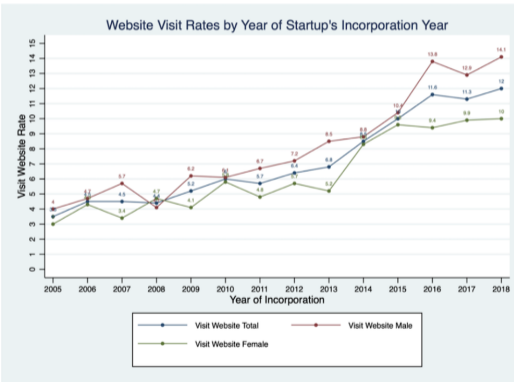
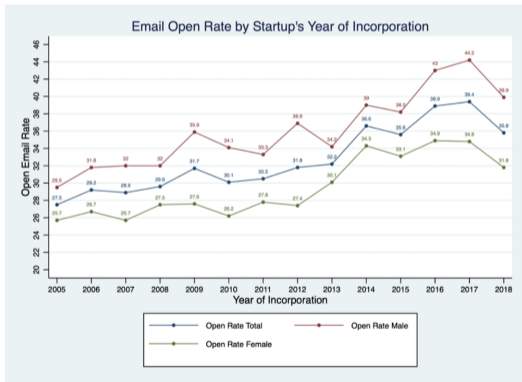
Summary Statistics

	Male RFE Investors (N = 19,830)		Female RFE Investors (N = 20,742)		Diff (t-stat)
	#Obs	Mean	#Obs	Mean	
Firm Incorporation Year	15,706	2012	16,266	2012	0.002 (0.052)
Last Funding Year	6,809	2016	6,902	2016	-0.006 (-0.131)
Total Funding Received	5,020	\$9.9 Mill	5,109	\$9.3 Mill	\$0.59 Mill (0.723)
All Male Co-Founders?	8,346	0.80	8,503	0.79	0.008 (1.330)
Ten or Fewer Employees?	16,823	0.51	17,495	0.51	0.000 (0.159)

US State Representation in RFE and Full Sample



Startup Response Rates by Year of Incorporation



Testing H1:

When faced with an unsolicited funding opportunity, startups prefer male investors



Primary RFE Sample

Panel A: RFE Observations

	Full Sample (N=40,572)			
	Male RFE Investor	Female RFE Investor	Excess Probability Ratio (Male/Female-1)	All Obs.
Received Email	19,830	20,742		40,572
Opens Email	6,817	5,808		12,625
(% of Receiving Email)	(34.38%)	(28.00%)	0.23	(31.1%)
Visits Website	1,469	1,211		2,680
(% of Receiving Email)	(7.41%)	(5.84%)	0.27	(6.61%)

Pearson's χ^2 test [1] = 101.873 (0.000)

Panel B: Logit Analysis

	(1) Opens Email	(2) Visits Website
RFE Sender is Male	0.33*** (15.03)	0.28*** (6.94)
RFE VC indicator	✓	✓
RFE certificate FE	✓	✓
Firm location state FE	✓	✓
Firm employee size FE	✓	✓
Firm incorporation year FE	✓	✓
Observations	40,572	40,563
Pseudo R ²	0.0268	0.0341

Testing H2:

Startups in a tech hub will prefer male investors more than their counterparts across the country



RFE Results – Tech Hubs Vs. Non-Tech Hubs

	Male RFE Investor	Female RFE Investor	Excess Probability Ratio (Male/Female – 1)	All Obs.
Tech Hubs (CA/NY/TX) Combined (N=19,671)				
Received Email	9,607	10,064		19,671
Opens Email	3,460	2,984		6,444
(% of Receiving Email)	(36.02%)	(29.65%)	0.21	(32.76%)
Visits Website	770	634		1,404
(% of Receiving Email)	(8.01%)	(6.30%)	0.27	(7.14%)

Pearson's X^2 test [1] = 46.713 (0.000)

	Male RFE Investor	Female RFE Investor	Excess Probability Ratio (Male/Female – 1)	All Obs.
Non-Hubs (Rest of States) Combined (N= 20,901)				
Received Email	10,223	10,678		20,901
Opens Email	3,357	2,824		6,181
(% of Receiving Email)	(32.84%)	(26.45%)	0.24	(29.57%)
Visits Website	699	577		1,276
(% of Receiving Email)	(6.84%)	(5.40%)	0.27	(6.10%)

Pearson's X^2 test [1] = 55.783 (0.000)

Testing H3:

Startup engagement will improve for a certified male investor and decline for a certified female investor



RFE Results – Certificate Carrying vs. Non-Certificate Carrying Investor

	Male RFE Investor	Female RFE Investor	Excess Probability Ratio (Male/Female – 1)	All Obs.
Investor With Professional License (N= 18,482)				
Received Email	8,882	9,600		18,482
Opens Email	3,389	2,532		5,921
(% of Receiving Email)	(38.16%)	(26.38%)	0.45	(32.04%)
Visits Website	645	430		1,075
(% of Receiving Email)	(7.26%)	(4.48%)	0.62	(5.82%)

Pearson's X^2 test [1] = 155.159 (0.000)

	Male RFE Investor	Female RFE Investor	Excess Probability Ratio (Male/Female – 1)	All Obs.
Investor Without Professional License (N= 6,283)				
Received Email	3,064	3,219		6,283
Opens Email	1,088	1,182		2,270
(% of Receiving Email)	(35.51%)	(36.72%)	-0.03	(36.13%)
Visits Website	223	242		465
(% of Receiving Email)	(7.28%)	(7.52%)	-0.03	(7.40%)

Pearson's X^2 test [1] = 0.467 (0.494)



- As a first of its kind, this field experiment uses cold-email correspondence to gauge whether founders react to unsolicited opportunities from potential investors
- Our results demonstrate a strong reaction to this communication method first, and secondly, gender-based discrimination against female investors
- Moreover, much of this discrimination remains undocumented as it occurs in the matching process's pre-contracting phase
- Finally, in line with theory on gender stereotypes, we find that credentials that suggest more capable or talented investors improve engagement for male investors but reduce female investors' appeal to founders



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