Tolerating Losses for Growth: J-Curves in Venture Capital Investing

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Motivation and Research Question

Motivation

- Venture capital is a key driver of innovation and growth (Lerner and Nanda 2020)
- A fundamental challenge for VC-backed startups is the trade-off between **short-term profitability and long-term growth**
- Often more ambitious development or growth strategies involve lower short-term profitability, i.e. a **J-curve** (e.g. Spotify, Uber)
- Requires investors that are willing to tolerate **prolonged financial losses** and imposes **financing risk** on startups (Nanda and Rhodes-Kropf 2023, 2017)
- Practitioners frequently argue that **US VCs are more loss-tolerant than other VCs**

Motivation

“The problem is not that Europe lacks ideas or ambition.(...) But innovation is blocked at the next stage: we are failing to translate innovation into commercialisation, and innovative companies that want to scale up in Europe are hindered at every stage (...).”

– Draghi (2024)

Research question

- Massive literature on VC fundraising and capital allocation (Da Rin and Hellmann 2020)
- **This paper:** First look at the **dynamics of capital use** in VC investing
- **Question: Do USVCs have deeper J-curves compared to non-USVC investors? And why?**
  - **Challenge:** Cash flow data is not available + non-random nature of VC investments
  - **Our solution:** Swedish registry data + stacked DiD design
- **So what?** Helps policymakers design better policies and stakeholders understand the industry better

Data and Identification

Data

- **Cashflow data:** Swedish Companies Registration Office
  - Companies must submit annual reports to the Companies Registration Office
  - Data on population of Swedish limited liability companies between 1998 and 2023
  - Annual reports and company events (e.g., bankruptcies)

- **VC data:** Crunchbase, Pitchbook, and VentureXpert
  - Investments and exits
  - VC firm characteristics (size, experience, LPs, etc)
  - VC firm country of origin
  - Exclude GVC

- **Data aggregation:**
  - Construct company-year panel for companies that ever receive VC funding

Estimation strategy

- **Stacked differences-in-differences estimator** combined with matching:
  - Matching allows us to account for sorting on observables (identical industry, stage, and quartiles in EBITDA and number of employees)
  - The stacked DiD estimator avoids biases in TWFE estimations
  - Allows us to compare USVC investments to non-USVC investments

- **Key identifying assumptions**:
  - Parallel trends in absence of treatment
  - SUTVA (no spillover effects)

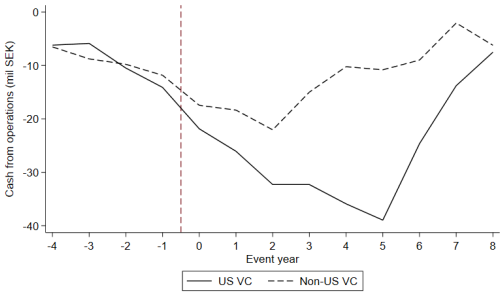
- **Need to account for**:
  - Matching on outcome level differences may create RTM bias (Daw and Hatfield 2018)
  - Weighting and aggregation of cohort estimates (Wing et al. 2024)

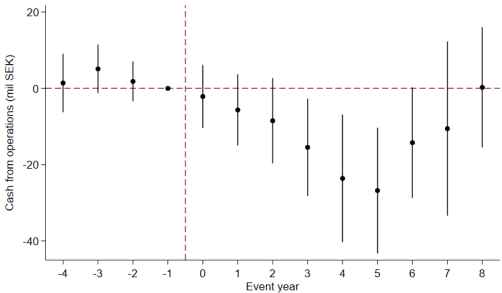
Sample descriptives

	(1) Full	(2) US VC	(3) Non-US VC	(4) Difference	(5) *t*-statistic
Assets (mil SEK)	31.838	33.899	31.132	2.768	(0.265)
ROA (%)	-67.575	-76.054	-64.671	-11.383	(-1.091)
Operating cash (mil SEK)	-12.409	-14.102	-11.829	-2.273	(-0.634)
Sales (mil SEK)	16.669	15.655	17.016	-1.360	(-0.243)
EBITDA (mil SEK)	-13.003	-13.979	-12.669	-1.310	(-0.446)
Profitable	0.145	0.184	0.132	0.052	(1.344)
Observations	490	125	365	490	

Do US Investors Have Deeper J-Curves?

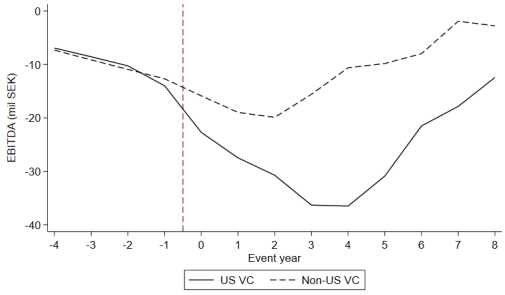
Cash from operations

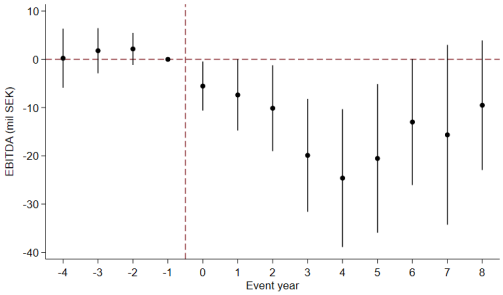




- DiD estimate at $t = 5$: **-26.8** (t-stat=-3.20)

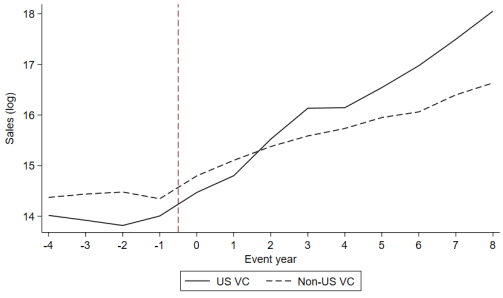
EBITDA

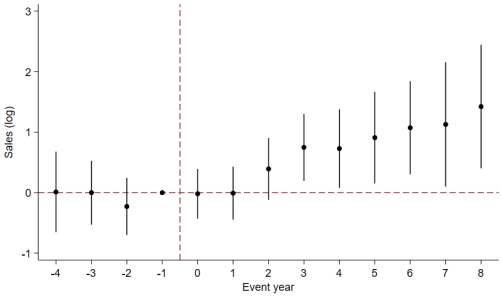




- DiD estimate at $t = 4$: **-24.6** (t-stat=-3.39)

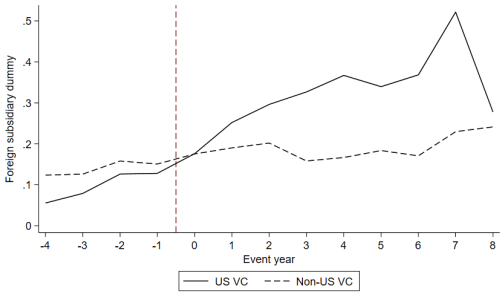
Sales

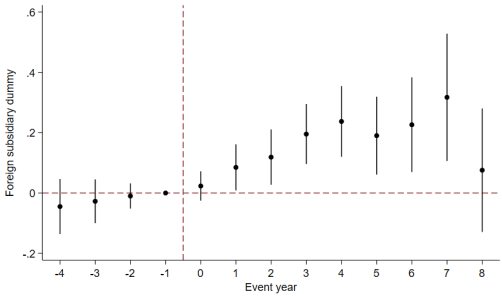




- DiD estimate at $t = 8$: **1.4** (t-stat=2.74)

International expansion





- DiD estimate at $t = 7$: **0.3** (t-stat=2.95)

Mechanisms

Why do USVCs have deeper J-curves?

- **We consider four core potential mechanisms:**
  1. More capital
  2. Better networks
  3. (More experience)
  4. (Different LPs)

- **Other stories:** selection, cultural differences, etc...

Why do USVCs have deeper J-curves?

Panel A: Company level: maximum VC firm values					
	(1) Full	(2) US VC	(3) Non-US VC	(4) Difference	(5) *t*-statistic
VC firm AUM (mil USD)	1393.326	4019.821	336.321	3683.499**	(2.512)
VC firm co-investors	84.330	183.207	49.038	134.168***	(6.959)
VC firm funded startups	127.228	168.595	112.463	56.132***	(2.947)
Observations	490	125	365	490	
Panel B: Company level: average VC firm values					
VC firm AUM (mil USD)	823.910	2119.085	302.681	1816.404*	(1.972)
VC firm co-investors	53.769	105.826	35.188	70.638***	(5.300)
VC firm funded startups	85.872	99.429	81.034	18.395	(1.401)
Observations	490	125	365	490	

- VCs of US origin have more capital, larger networks, and more experience

Mechanisms

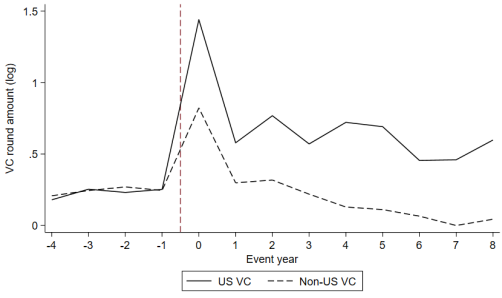
Size of VC Firm

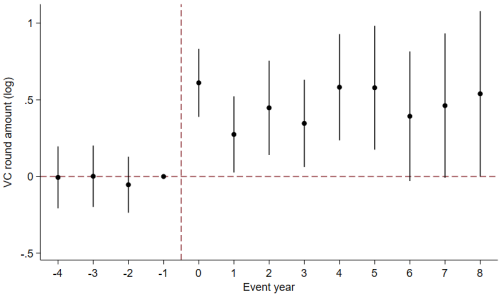
Size of VC Firm

- **Story:** USVCs manage more capital, which means they can more easily sustain losses over a longer time horizon

- **Tests:**
  - Are USVC investments associated with higher capital injections and more follow-on funding?
  - Narrow in on subsamples of investments by either “large” or “small” VCs. Do USVCs still have deeper J-curves?

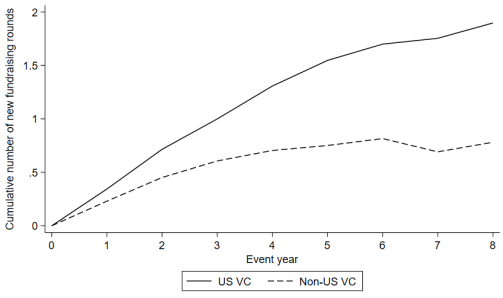
Investment amounts

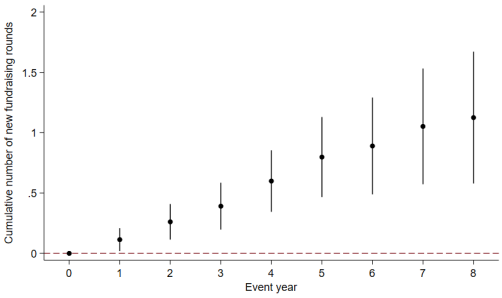




- DiD estimate at $t = 0$: **0.6** (t-stat=5.41)

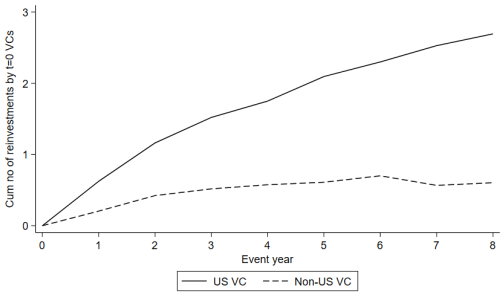
Follow-on funding (cumulative rounds)

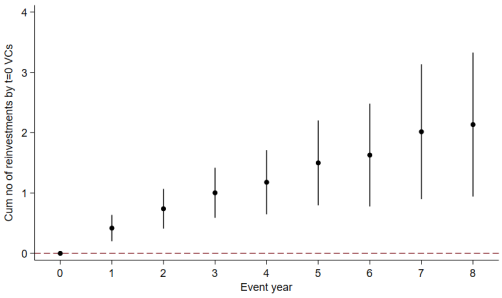




- DiD estimate at $t = 8$: **1.1** (t-stat=4.05)

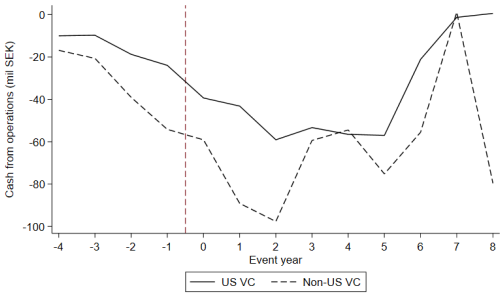
Reinvestments by $t = 0$ firms (cumulative)

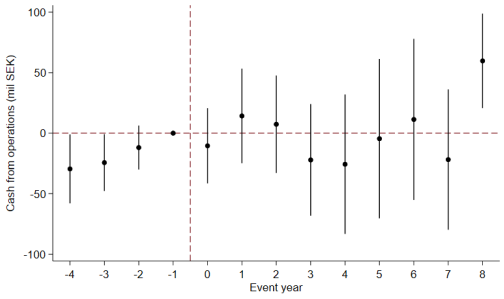




- DiD estimate at $t = 8$: **2.1** (t-stat=3.52)

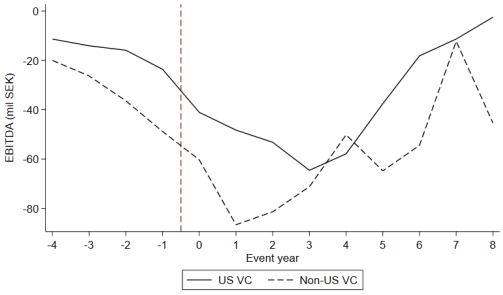
Cash from operations in “large” subsample

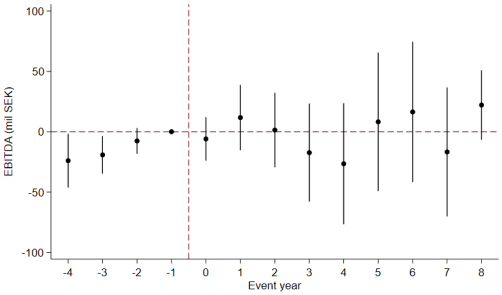




- DiD estimate (full): **13.4** (*t*-stat=0.97)

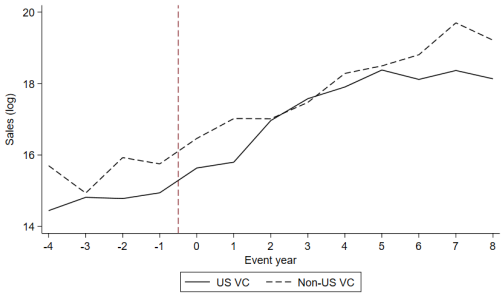
EBITDA in “large” subsample

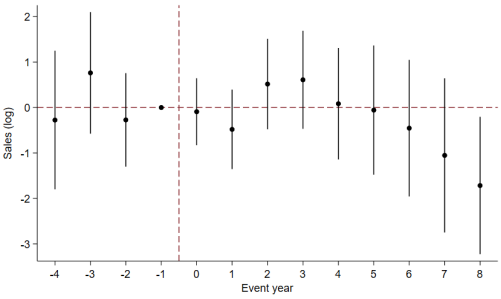




- DiD estimate (full): **10.5** (*t*-stat=0.81)

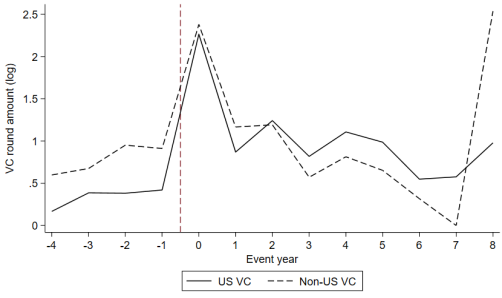
Sales in “large” subsample

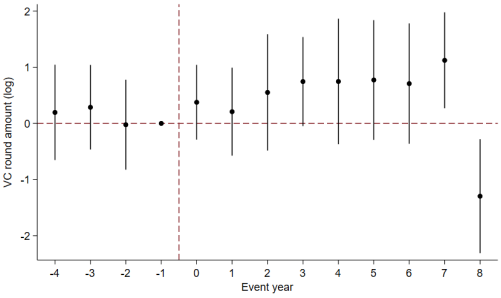




- DiD estimate (full): **0.02** (*t*-stat=0.05)

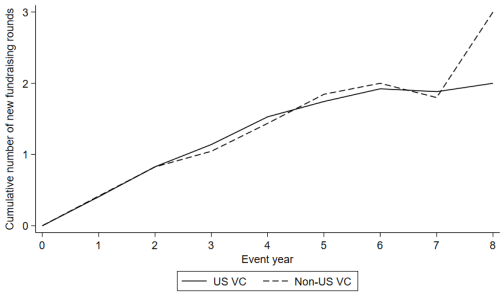
Investment amounts in “large” subsample

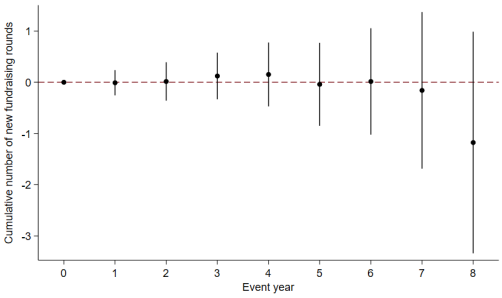




- DiD estimate (full): **0.4** (*t*-stat=1.70)

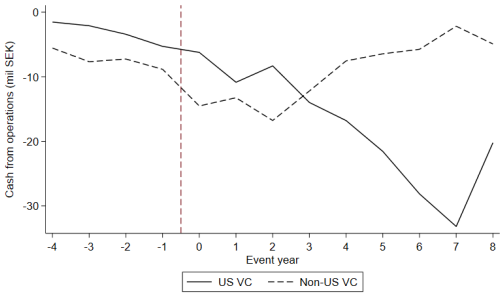
Follow-on funding (cumulative rounds) in “large” subsample

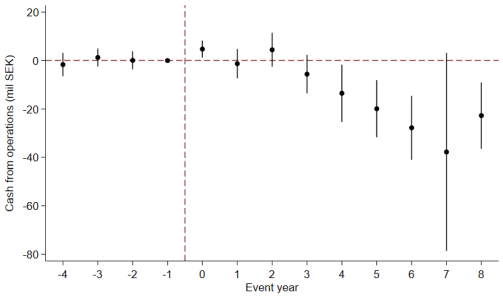




- DiD estimate (full): **0.1** (*t*-stat=0.32)

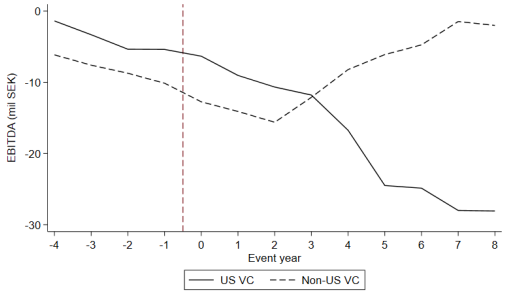
Cash from operations in “small” subsample

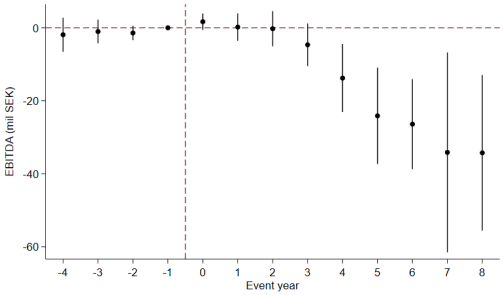




- DiD estimate (full): **-5.8** (*t*-stat=-2.44)

EBITDA in “small” subsample





- DiD estimate (full): **-6.2** (*t*-stat=-2.60)

Summary: Larger investors

- **Story:** USVCs manage more capital, which means they can more easily sustain losses over a longer time horizon

- **Results:**
  - USVC investments associated with higher capital injections and more follow-on funding
  - Comparing “large” VC investments only, the USVC difference in outcomes largely disappears
  - There is a delayed USVC J-curve in the “small” subsample, which suggests that investor networks might be important among “small” VCs

→ **Investors size is a key mechanism of why USVCs have deeper J-curves**

Mechanisms

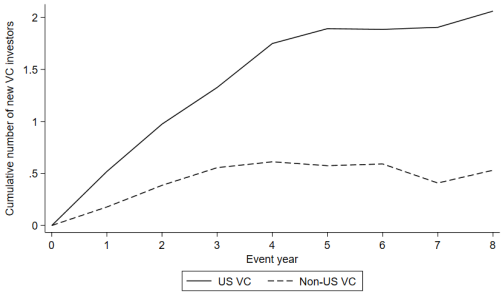
Better Networks

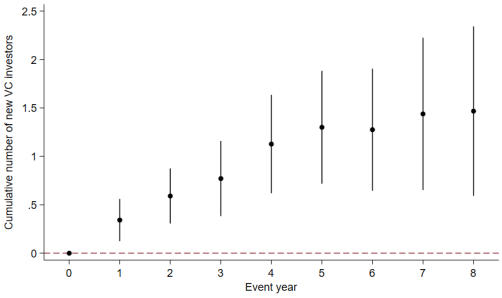
Better networks

- **Story:** USVCs have better networks, meaning they can drive deeper J-curves as they can more easily tap into follow-on capital (Nanda and Rhodes-Kropf 2016)

- **Tests:**
  - Do USVCs bring in more new investors?
  - Do they bring in more investors conditional on having a “large” or “small” VC?

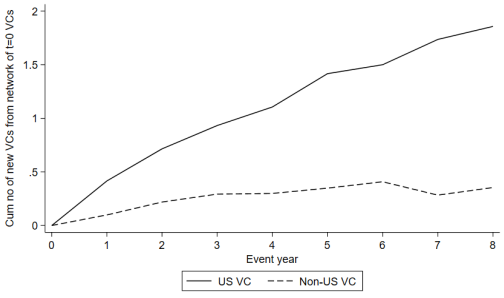
New investors

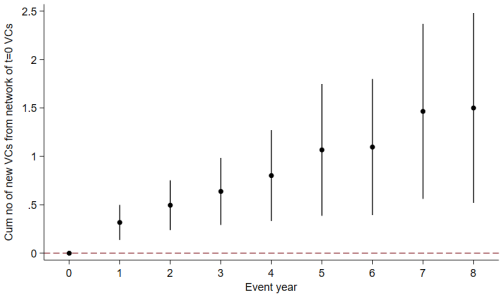




- DiD estimate at $t = 8$: **1.5** (t-stat=3.29)

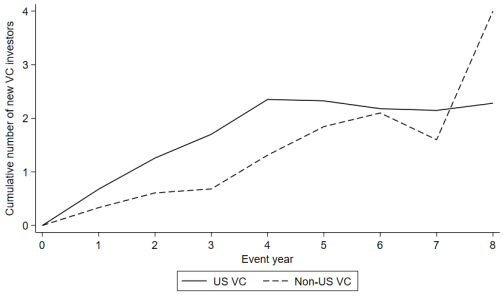
New investors from $t = 0$ VCs' network

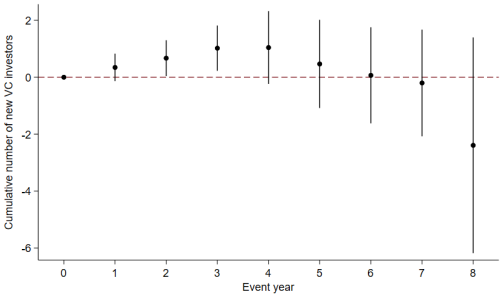




- DiD estimate at $t = 8$: **1.5** (t-stat=3.01)

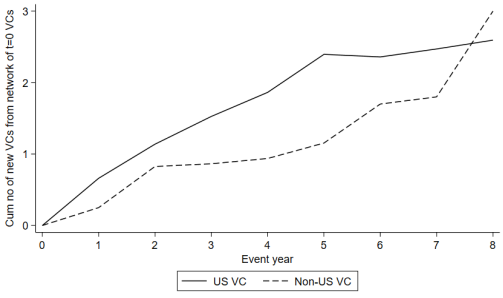
New investors in “large” VC subsample

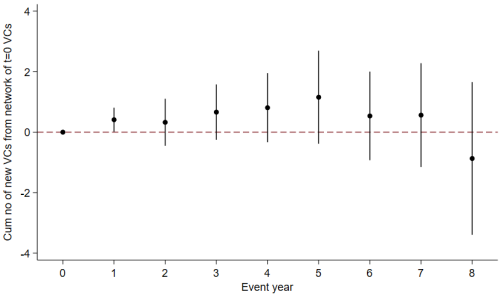




- DiD estimate (full): **0.9** (*t*-stat=2.05)

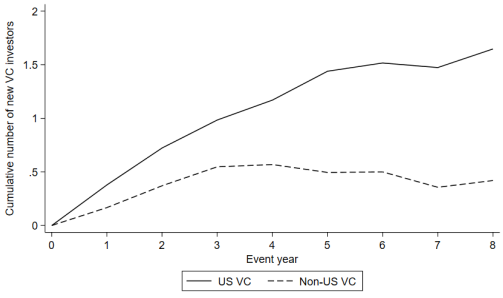
New investors from $t = 0$ VCs' network in "large" VC subsample

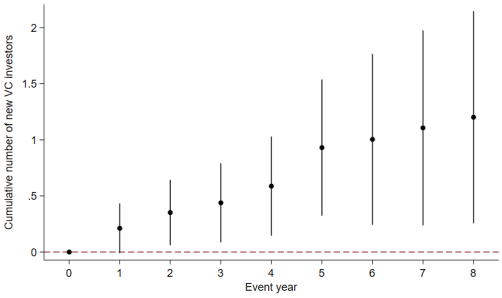




- DiD estimate (full): **0.8** (t-stat=1.77)

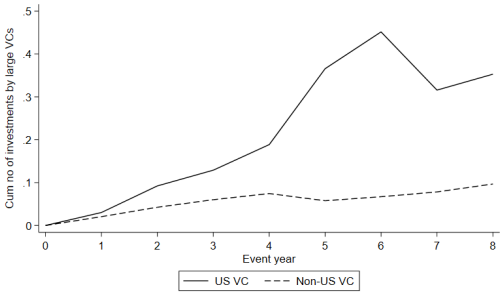
New investors in “small” VC subsample

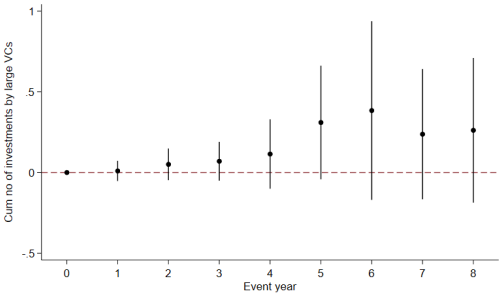




- DiD estimate (full): **0.5** (*t*-stat=2.93)

Investments by large VCs in “small” VC subsample





- DiD estimate (full): **0.1** (*t*-stat=1.75)

Summary: Better networks

- **Story:** USVCs have better networks, meaning they can drive deeper J-curves as they can more easily tap into follow-on capital (Nanda and Rhodes-Kropf 2016)

- **Tests:**
  - Do USVCs bring in more new investors? YES
  - Do they bring in more investors conditional on having a “large” VC? NO
  - Do they bring in more investors conditional on having a “small” VC? YES

→ Investor size seems to be of primary importance for deeper J-curves
→ Investor networks allow “small” VCs to have deeper J-curves by bringing in more follow-on funding

Takeaways

Summary

- Massive literature on VC fundraising and capital allocation (Da Rin and Hellmann 2020)
- **This paper:** First look at the **dynamics of capital use** in VC investing
- **Question: Do USVCs have deeper J-curves compared to non-USVC investors? And why?**
  - **Challenge:** Cash flow data is not available + non-random nature of VC investments
  - **Our solution:** Swedish registry data + stacked DiD design
- **So what?** Helps policymakers design better policies and stakeholders understand the industry better

Policy

1. **Recognize the value of loss tolerance:** Policy frameworks for ecosystems should avoid prematurely emphasizing early profitability. Support policies that enable startups to pursue aggressive, long-term growth strategies—e.g., through longer runway financing instruments or internationalization support
2. **Reform LP mandates in public VC programs:** Government-backed VC funds should allow for staged, risk-tolerant investment strategies and syndication with large VCs, mimicking the behavior of successful US LPs and GPs
3. **Implement a real capital markets union:** Europeans save about double that of Americans (15%), but a third of the savings sit idle in bank accounts. More of these savings need to go to European startups (would support larger fund sizes in Europe)