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

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Motivation and Research Question

- Venture capital is a key driver of innovation and growth (Lerner and Nanda 2020)

- A fundamental challenge for VC-backed start-ups 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 start-ups (Nanda and Rhodes-Kropf 2023, 2017)

- Practitioners frequently argue that **US VCs are more loss-tolerant than other VCs**

Motivation

"US VC funds generally tend to adopt a home run strategy. (...) In contrast the high risk appetite (...) in the USA is not mirrored in the UK and Europe. (...) American VC firms place greater emphasis on the companies ability to establish product market fit (...). In comparison European and UK funds place greater emphasis on the finance and profitability of the company."

- Kumar (2018)

"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

Literature and contribution

- **Staged financing and financing risk:**
  - Staged financing Sahlman 1990; Gompers 1995; Neher 1999; Kerr et al 2014
  - Financing risk and innovation incentives Nanda and Rhodes-Kropf 2013, 2017
  - Failure tolerance in VC Tian and Wang 2011; Ewens et al 2018
  - VC funding and portfolio company productivity Chemmanur et al 2011; Puri and Zarutskie 2012; Croce et al 2013; Chemmanur et al. 2018
  - The role of scale-ups and short term profitability (Hellmann and Thiele 2023; Norbäck, Fresard et al. 2023, Persson, and Tåg 2024)

- **Contribution:**
  - First large scale **empirical evidence** of J-curves in VC investing
  - Documenting **differences in J-curves across investor origin**
  - Investigation of **mechanisms** driving differences across investor origin

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 for (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-fiscal year panel for companies that ever receive VC funding (by collapsing rounds)

Empirical challenges

- US VC investors in Sweden likely to sort on observables and unobservables:
    - Observables: industry, size, stage, profitability
    - Unobservables (fixed): quality of startup
    - Unobservables (time varying): ability to scale abroad, leadership, etc

- VC investments take place over time in a staggered manner:
    - Standard TWFE estimates are biased (Baker et al 2022, 2025)

Estimation strategy

- Stacked differences-in-differences estimator combined with matching:
  - Matching allows us to account for sorting on observables
  - 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)
  - Heterogeneity: triple difference estimates (Olden and Moen 2022)

The estimation sample

- **Sample construction:**
    1. Take each cohort up to 2020 separately and pick up first US VC investment vs non-US VC investments for companies not currently US VC-backed.
    2. Require two fiscal reporting years prior to investment and drop industries (21) with no USVC investments
    3. Cell match non-USVC investments to USVC investments by ensuring identical industry (5-digit), stage (3 levels), and quartiles in EBITDA and number of employees
    4. Create panels for each cohort
    5. Append/stack the panels together

Sample descriptives

	(1) Full	(2) US VC	(3) Non-US VC	(4) Difference	(5) t-statistic
Assets (mil SEK)	33.581	32.303	34.076	-1.774	(-0.155)
ROA (%)	-78.870	-82.434	-77.489	-4.945	(-0.397)
Observations	333	93	240	333	
Operating cash (mil SEK)	-15.185	-15.501	-15.062	-0.439	(-0.104)
Observations	333	93	240	333	
Foreign subsidiary dummy	0.174	0.140	0.188	-0.048	(-1.082)
Employees	16.476	15.665	16.790	-1.125	(-0.337)
VC backed	0.495	0.527	0.483	0.044	(0.711)
Round number	0.841	0.849	0.838	0.012	(0.093)
Round amount (mil USD)	1.463	2.567	1.035	1.532	(0.931)
Sales (mil SEK)	15.408	12.392	16.576	-4.184	(-0.964)
EBITDA (mil SEK)	-16.085	-16.183	-16.048	-0.135	(-0.037)
Profitable	0.132	0.151	0.125	0.026	(0.594)
Observations	333	93	240	333	

Regression model

- **Run standard (weighted) DiD model:**

$$Y_{f,k,t} = \alpha + \pi After_k + \gamma USVC_f + \beta After_k \times USVC_f + \epsilon_{f,k,t} \qquad (1)$$
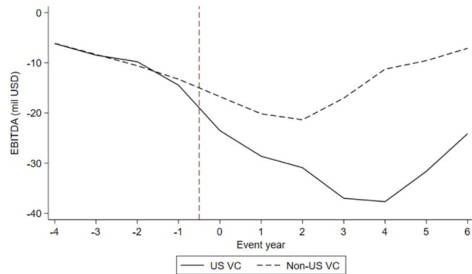
- **Notes:**
  - We follow companies from up to 4 years before to up to 5 years after investments
  - Control firms can appear multiple times and also later receive USVC investments (but not prior)
  - We cluster standard errors at the company-cohort level and include cohort FE
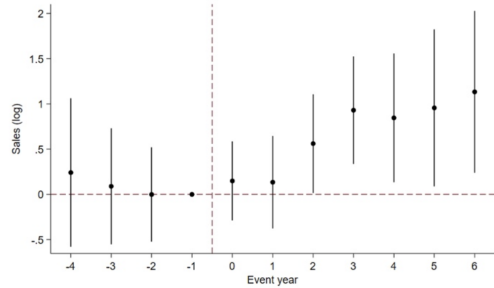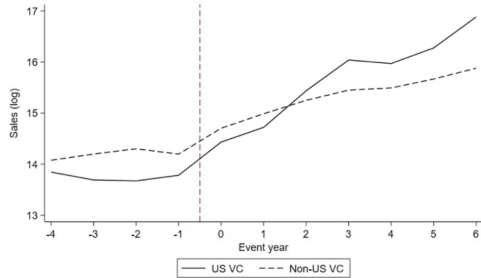
Do US investors have deeper J-curves?
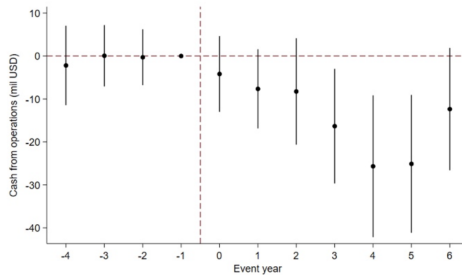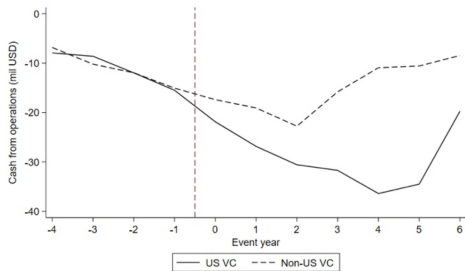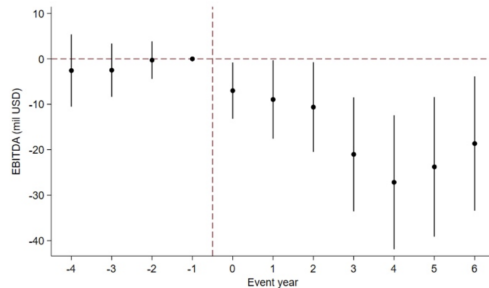
- Mean US VC backed Exit (IPO): $572M ($454M)

- Mean non-US VC backed Exit (IPO): $220M ($165M)
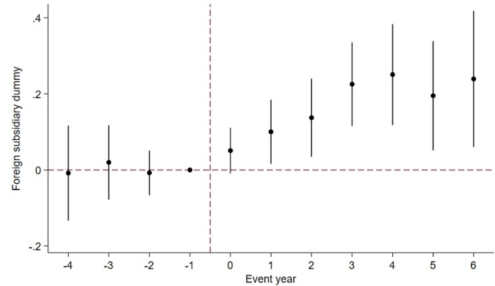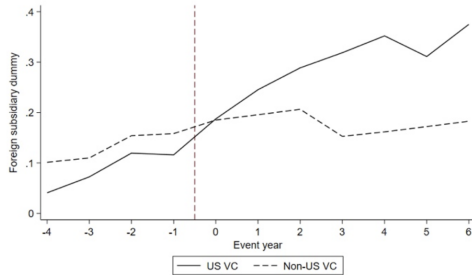
	Panel A: DiD regressions			
	(1) Operating cash	(2) EBITDA	(3) Sales (log)	(4) For subsidiary
US VC	-1.1454	-1.1431	-0.4819*	-0.0568
	(-0.388)	(-0.396)	(-1.914)	(-1.348)
Post	-6.4924***	-5.5349***	0.6434***	0.0257
	(-3.910)	(-3.515)	(5.664)	(1.244)
US VC#Post	-11.7138***	-13.6010***	0.5095**	0.1478***
	(-3.061)	(-3.378)	(2.091)	(3.527)
Cohort FEs	Yes	Yes	Yes	Yes
Observations	2,910	2,910	2,910	2,910
Adj. R^2	0.055	0.068	0.849	0.078
Effect size (%)	97	105	5	124

Mechanisms

Why do USVCs have deeper J-curves?

- **We consider four core potential mechanisms:**
  1. Larger funds
  2. Better networks
  3. More experience with scaling
  4. Different LPs

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

- **Approach:** subsample DiD and DiDiD regressions (nb: sample size)

$$Y_{s,k,t} = \alpha + \pi \text{Post}_k + \gamma \text{USVC}_s + \delta \text{LargeFund}_s + \beta_1 \text{Post}_k \times \text{USVC}_s$$
$$+ \beta_2 \text{Post}_k \times \text{LargeFund}_s + \beta_3 \text{Post}_k \times \text{USVC}_s \times \text{LargeFund}_s + \varepsilon_{s,k,t} \tag{2}$$

Mechanisms

Larger Funds

Larger Funds

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

- **Tests:**
  - Are USVC investments associated with higher capital injections?
  - Cut sample by USVC firm size (capital managed). Conditional on fund size, do USVCs still have deeper J-curves?
  - Are larger lead investors more likely to follow up with more cash?
  - Is time to next round shorter for VC firms with larger fund sizes?
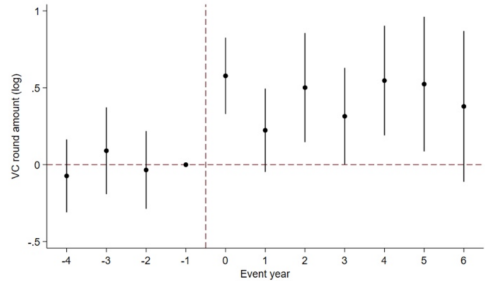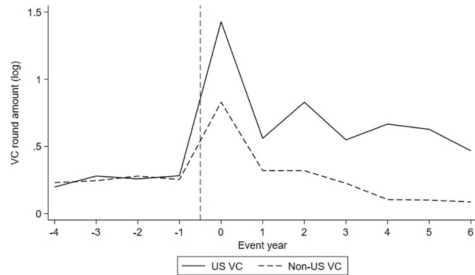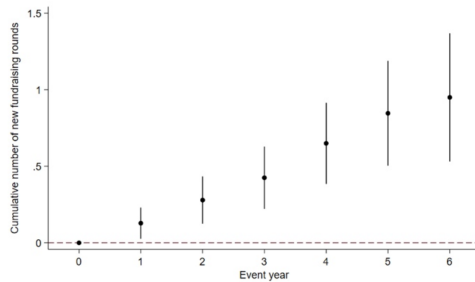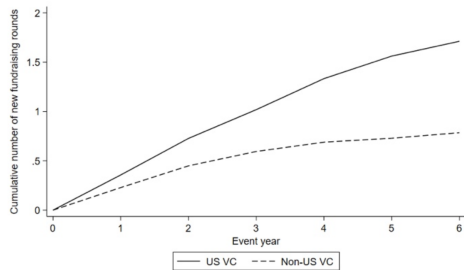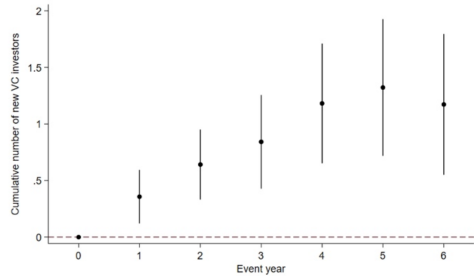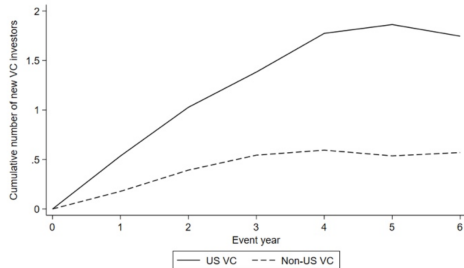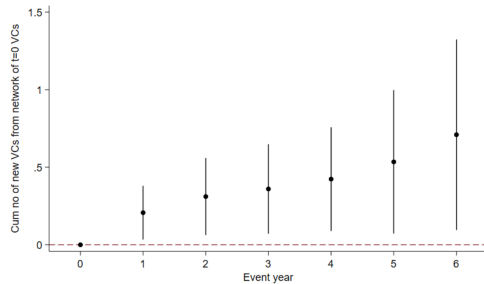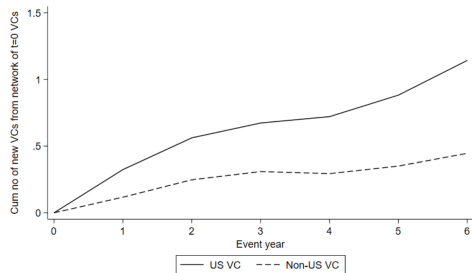
Mechanisms

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 USVCs have higher quality networks? Cut sample by *investor prominence*. Conditional on prominence, do USVCs still have deeper J-curves?
    - Is time to next round shorter for VC firms with higher prominence?

- **Investor prominence:** Composite index of prior investments with VCs that have top quartile IPO experience, unicorn count, and investment breath.

Mechanisms

More Experience with Scaling

More experience with scaling

- **Story:** USVCs have more experience with scaling firms globally, so they know how important short term losses are for long term growth.

- **Tests:**
    - Cut sample by *investor global scaling experience*. Conditional on scaling experience, do USVCs still have deeper J-curves?
    - Is time to next round shorter for VC firms with higher prominence?

- **Global scaling experience:** Composite index of prior IPOs of foreign firms, prior foreign unicorn experience, prior experience with foreign investments.
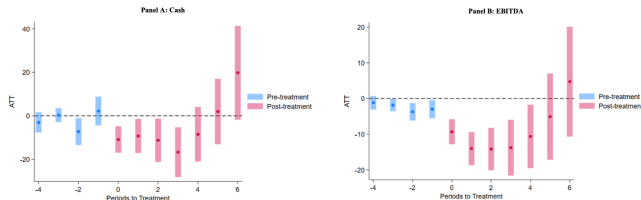
Mechanisms

Different LPs

Different LPs

- **Story:** USVCs have LPs that tolerate prolonged losses, others don't

- **Tests:**
    - Cut sample by LP country origin or size. Conditional on LP characteristics, do USVCs still have deeper J-curves?

Additional Analyses and Robustness

**Alternative estimation samples and strategies**

- TWFE estimation (CS DID):

- Also robust to:
    - Restricting to firm age 3 or 4 and more
    - Adding FE for firm age, industry, location
    - Controlling for company observables measured at $t = -1$ (assets, sales ect.)
    - US vs Sweden, US vs non-US (excluding Sweden)

Differential attrition

- **Issue:** Differential attrition out of the sample can introduce biases

- **Check:** Run regressions with pre-investment variables on the LHS. Expect loading on coefficients only if differential selection is an issue.
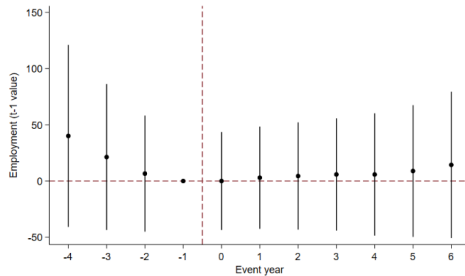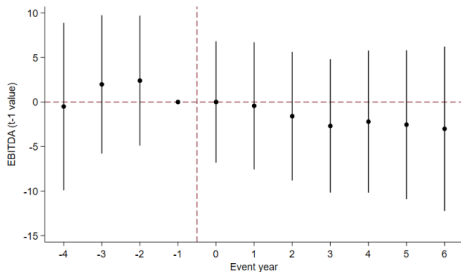
Additional analyses relating to selection

- **Selection regressions:** Estimate selection regression including everything we can observe at **firm** or **entrepreneur** level

- **Exclusion tests:** Replicate results excluding "top" USVCs as they may have different selection criteria

- **Investor reach:** Exploit variation on local exposure to USVCs in an IV setting.

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?**
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Policy Takeaways

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 start-ups (would support larger fund sizes in Europe).