

Growing Entrepreneurial Clusters

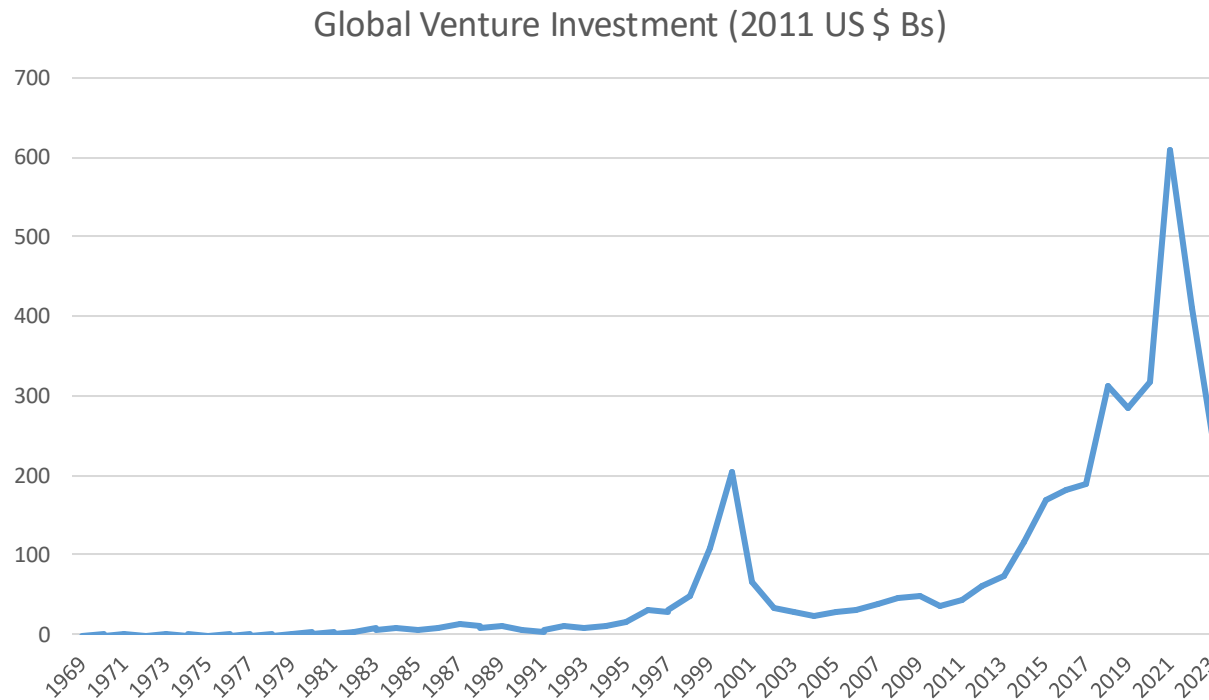
Josh Lerner
Harvard Business School

Growth Academy 2024

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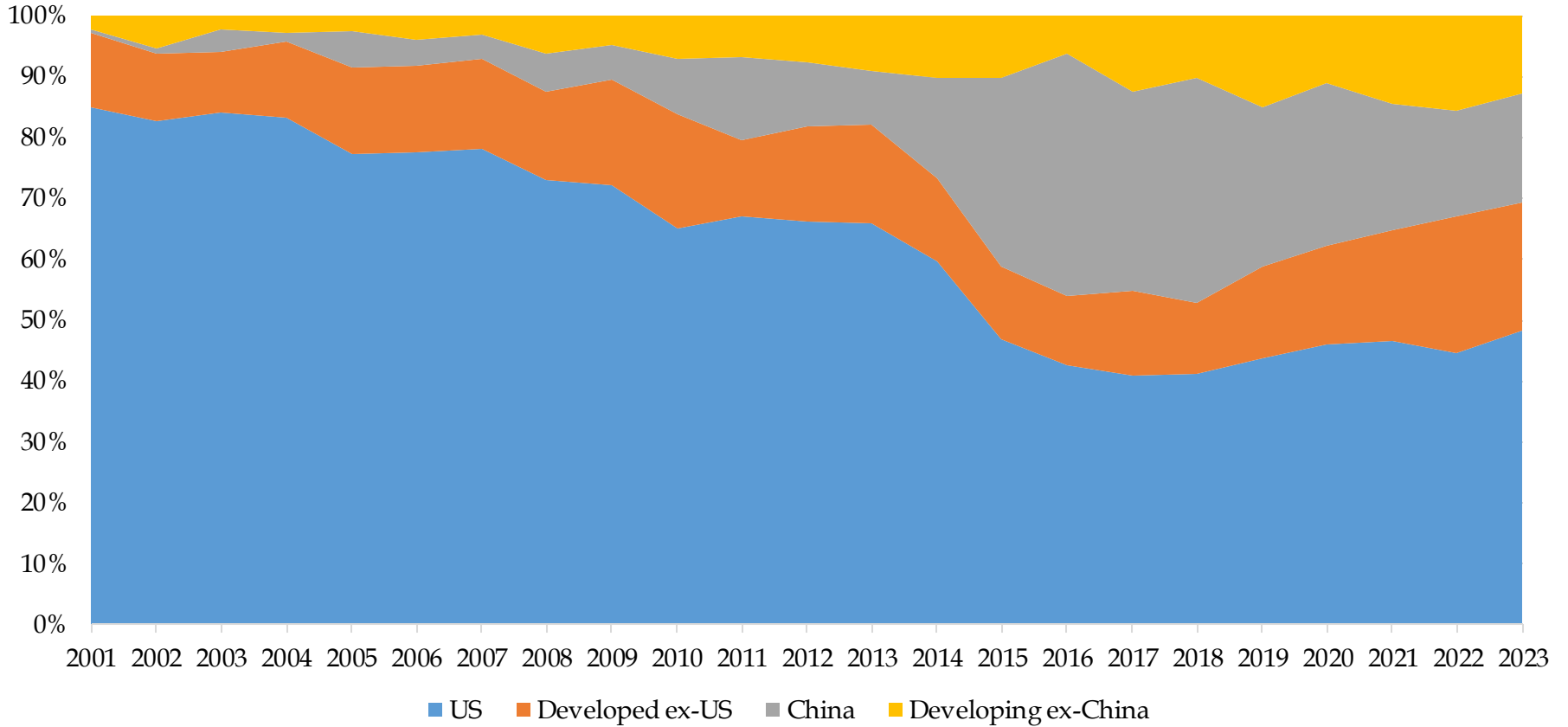
Huge surge in entrepreneurial activity...

- Incredible venture surge in early 2020s investment globally.



Source: Compiled from PitchBook and Refinitiv data.

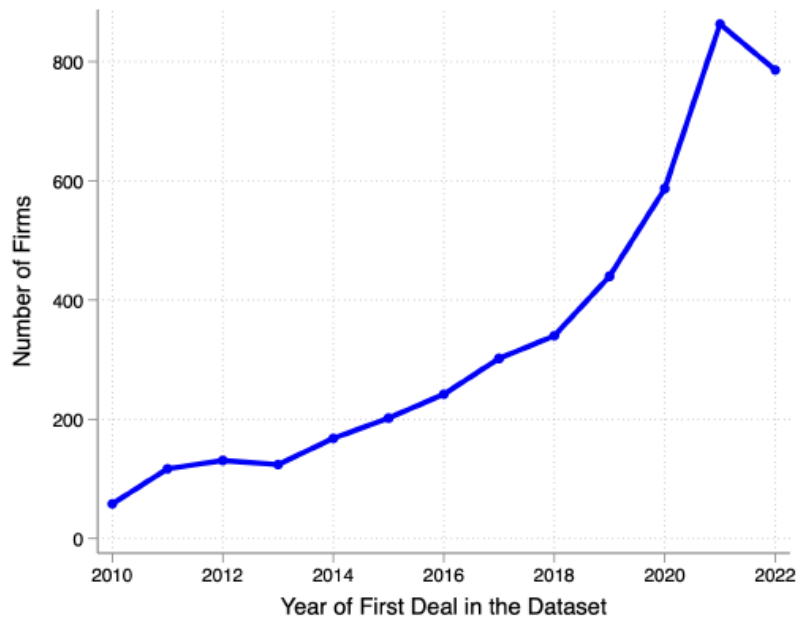
and increasing globalization...



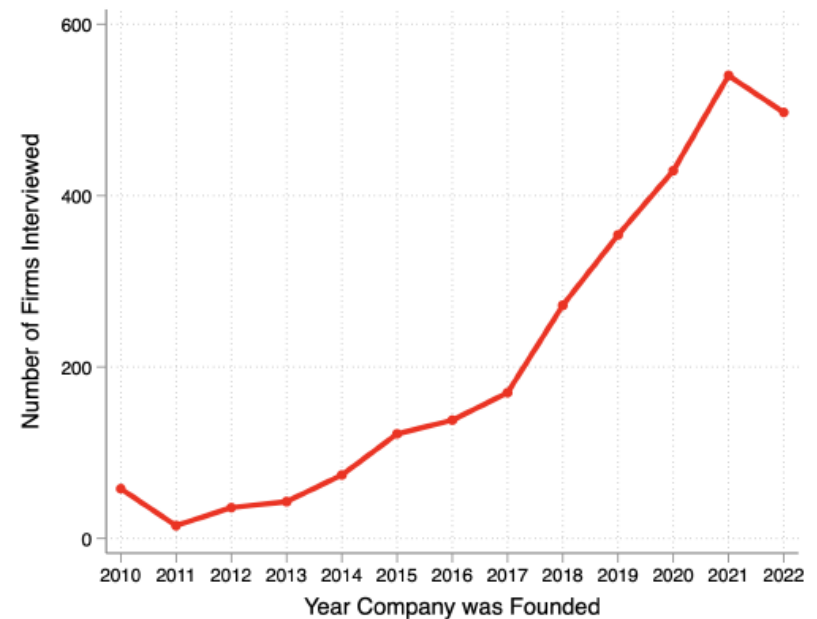
Source: Josh Lerner, Junxi Liu, Jacob Moscona, and David Yang, "Appropriate entrepreneurship? The rise of China and the developing world," National Bureau of Economic Research, Working Paper No. 31898, 2024.


Even in formerly neglected regions, such as Africa...

Established Startups



Early Ventures






... raise many questions about how important VC should be to policymakers?



This talk

- Will highlight two key points:
 - Venture capital is critical for innovation.
 - But good policy can be challenging to implement.



1. Venture capital is critical for innovation



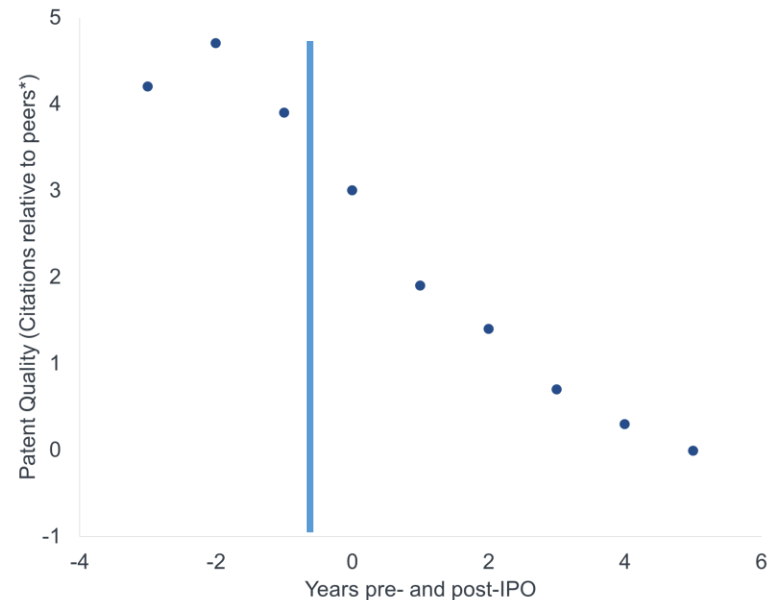
Entrepreneurship is an important driver of new ideas.

- Acs and Audretsch look at 100s of key innovations in second half of 20th century:
 - Small firms contribute disproportionate share of major innovations.
 - Contribution was greatest in immature industries which were relatively unconcentrated.
 - Consistent with models of technological competition.

Staying private for long times can be good for companies.

- Private companies generally have fewer reporting requirements and less quarter-to-quarter financial pressure.
- Evidence also shows that **private companies are more innovative.**
 - Relative to peers, the quality of innovation decreases after a company IPOs.


QUALITY OF INNOVATION IN YEARS AROUND THE IPO



Sources: Shai Bernstein, "Does going public affect innovation?," *Journal of Finance*, 70 (2015), 1365-1403; Sabrina T. Howell, Josh Lerner, Ramana Nanda, and Richard R. Townsend. "How resilient is venture-backed innovation? Evidence from Four Decades of U.S. patenting," National Bureau of Economic Research, Working Paper No. 27828, 2020.

8

*Scaled Citations scale each patent count by the average number of citations of matched patents, where matched patents are patents granted in the same year and in the same technology class. We exclude confidence intervals for clarity.



But small firms face many challenges when accessing resources.

- Difficult to access bank financing:
 - Perceived risk.
 - Lack of tangible assets.
- Angels difficult to access and mercurial.
- Public market capital is hard to access.
 - Can lead to pressures, as shown above.
- Lack of credibility with corporations and financial intermediaries.



General Georges Doriot's insight.

- Worries about dangers of post-War stagnation in U.S.
- Saw innovations developed during the War, especially in Boston area, as key potential economic driver.
- Need for new financial institution playing three roles:
 - Sorting.
 - Governing.
 - Certifying.
- Created first venture capital firm, American Research and Development in 1946.

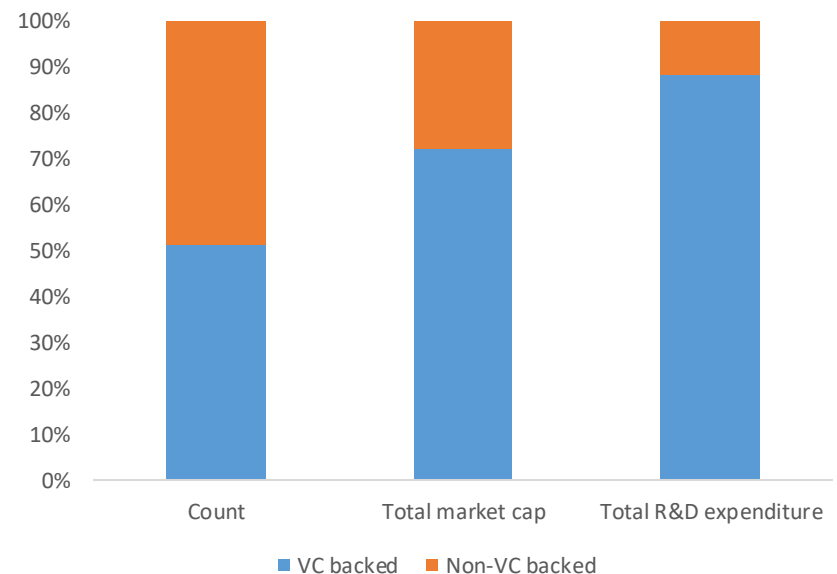
He was right!

- Kortum and Lerner look at relationship between venture capital and innovation:
 - Look at evidence across 20 industries, using patenting and other proxies for innovation:
 - Also control for corporate R&D, *etc.*
- Venture capital appears ~3 to 4 times more powerful than corporate R&D.
 - Even after controlling for causality concerns.
- From late 70s to mid-90s, VC was only 3% of corporate R&D, but responsible for ~10%-12% of privately funded innovations.

VC has become a key funding source for growing firms.

- VC's popularity is not surprising given its benefits to entrepreneurs.
 - Such as mentorship, credentialing, potential to scale quickly, etc.
- Of the non-financial US companies going public between 1995 and 2019, **45%** were venture backed.
- Of those companies still publicly traded at the end of 2019, **51%** were venture backed, representing:
 - **72%** of the total market cap.
 - **88%** of total R&D expenditure.
- Even in emerging markets ex China, almost 50% of R&D!!!

Breakdown of public companies (as of 2019 end)



VC-backed firms are particularly innovative.

- We investigate the relationship between VC and quality innovation using patent data:
 - VC-affiliated patents are **2.6 times more likely** than patents at large to be in the top 10% of subsequent citations.
 - Find that VC-affiliated patents are **4.6 times more likely** than patents at large to be in the top 1% of subsequent citations.
 - Find that VC-affiliated patents are **2.6 times more likely** than patents at large to be in the top 1% of intellectual breadth.
 - And **3.9 times more likely** to be a top 1% patent related to **path breaking science**.

Greater engagement by VCs leads to better outcomes.

- More VC engagement with companies leads to **more innovation** and **better outcomes**.
- Researchers consider the reduction in travel time between the VC and the company.
 - Measured by the introduction of a direct flight.
 - This allows more frequent visits to the company by the VC.
- When travel times were reduced in this way, VCs engaged more with companies.
 - This led to better outcomes!

+9.1%

Greater engagement* by the VC leads to a 9.1% increase in the number of **patents** (citation-weighted) from the portfolio company.

+5.6%

Greater engagement* by the VC leads to a 5.6% greater probability of a **successful exit** (e.g., trade sale or IPO).**

*Greater engagement measured here by the introduction of a new direct flight route – a proxy for VCs' ability to engage more directly with a portfolio company.

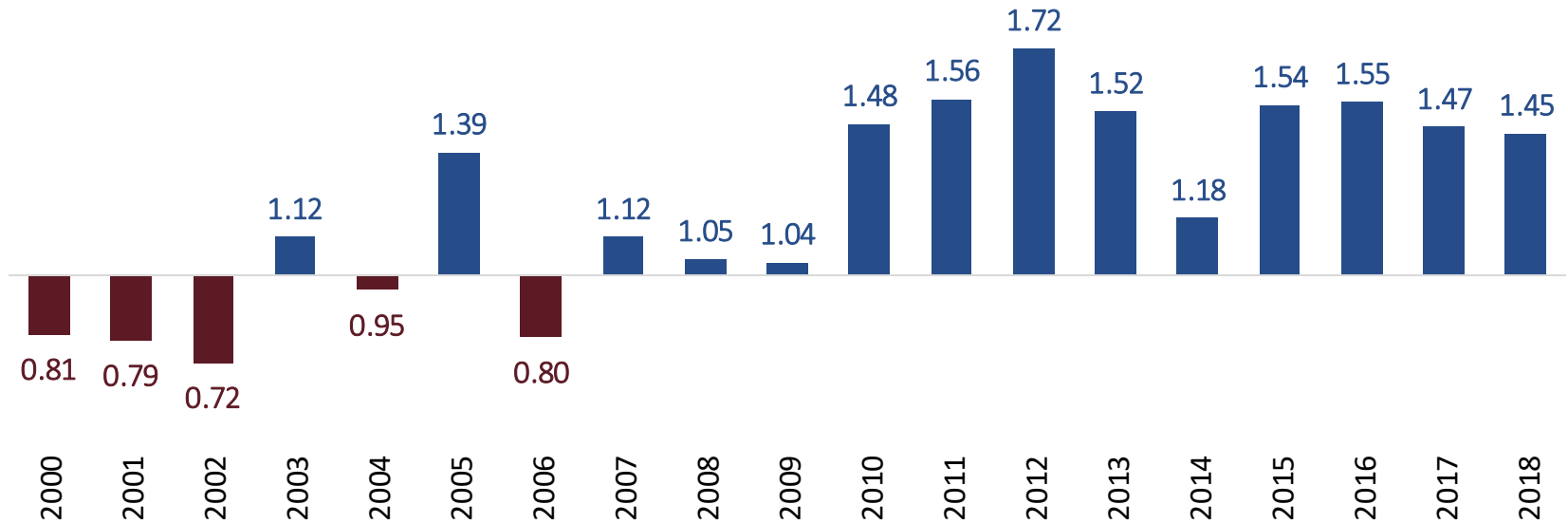
**This calculation assumes a baseline probability of a successful exit of 25%, an estimate based on work by Professor Shikhar Ghosh of Harvard Business School, as reported in the Wall Street Journal.

Source: Shai Bernstein, Xavier Giroud, and Richard Townsend. "The impact of venture capital monitoring." *Journal of Finance*, 71 (2016):1591–1622.; Deborah. Gage, "The venture capital secret: 3 Out of 4 start-ups fail." *Wall Street Journal*, September 20, 2021.

He was right! (2)

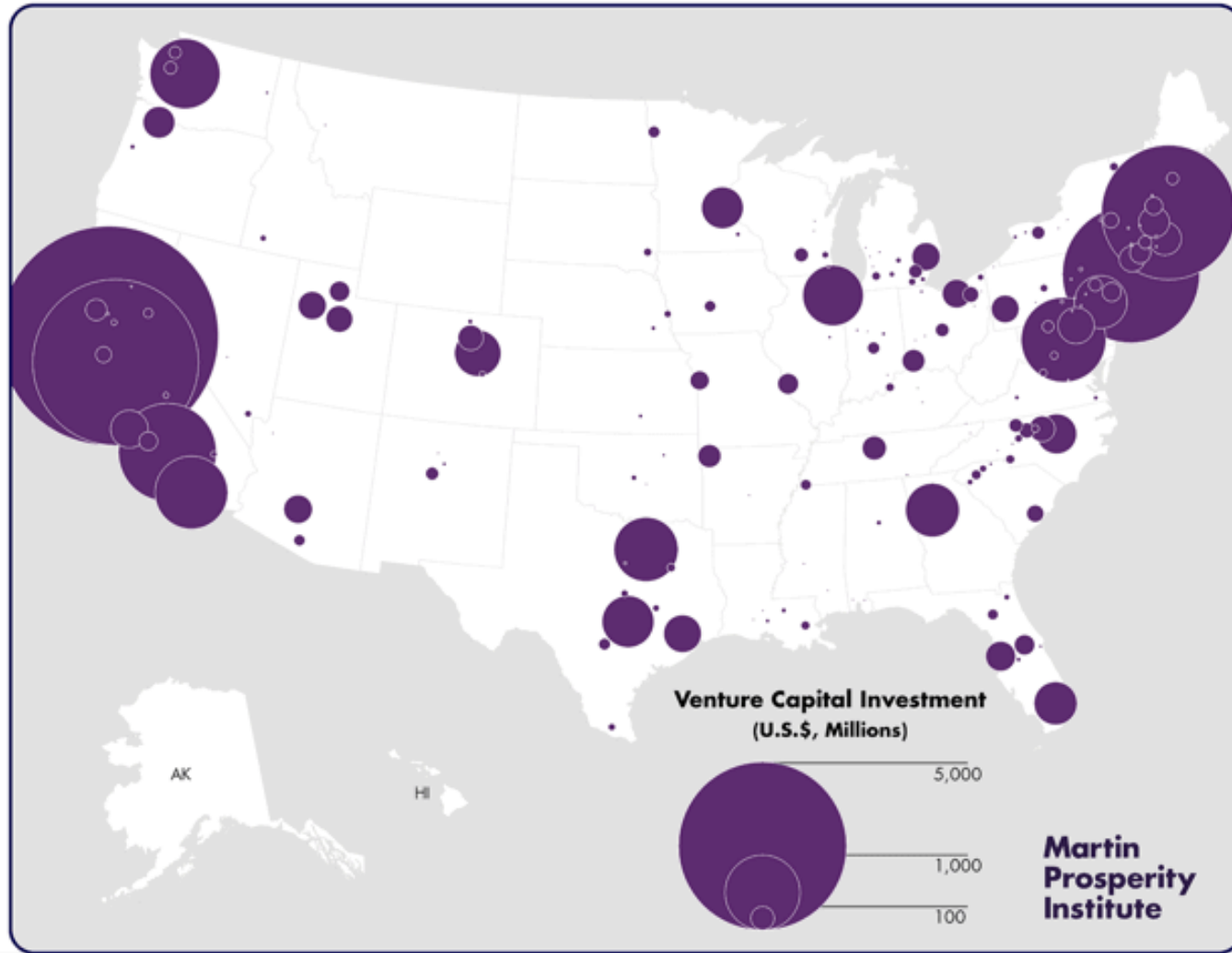
- VC has historically outperformed public markets.
 - The KS-PME shows the relative performance of VC funds versus public markets (in this case, the S&P 500), where a value of greater than 1.0 indicates private markets outperformed.

US VC KS-PMES USING S&P 500 AS PUBLIC INDEX BY VINTAGE



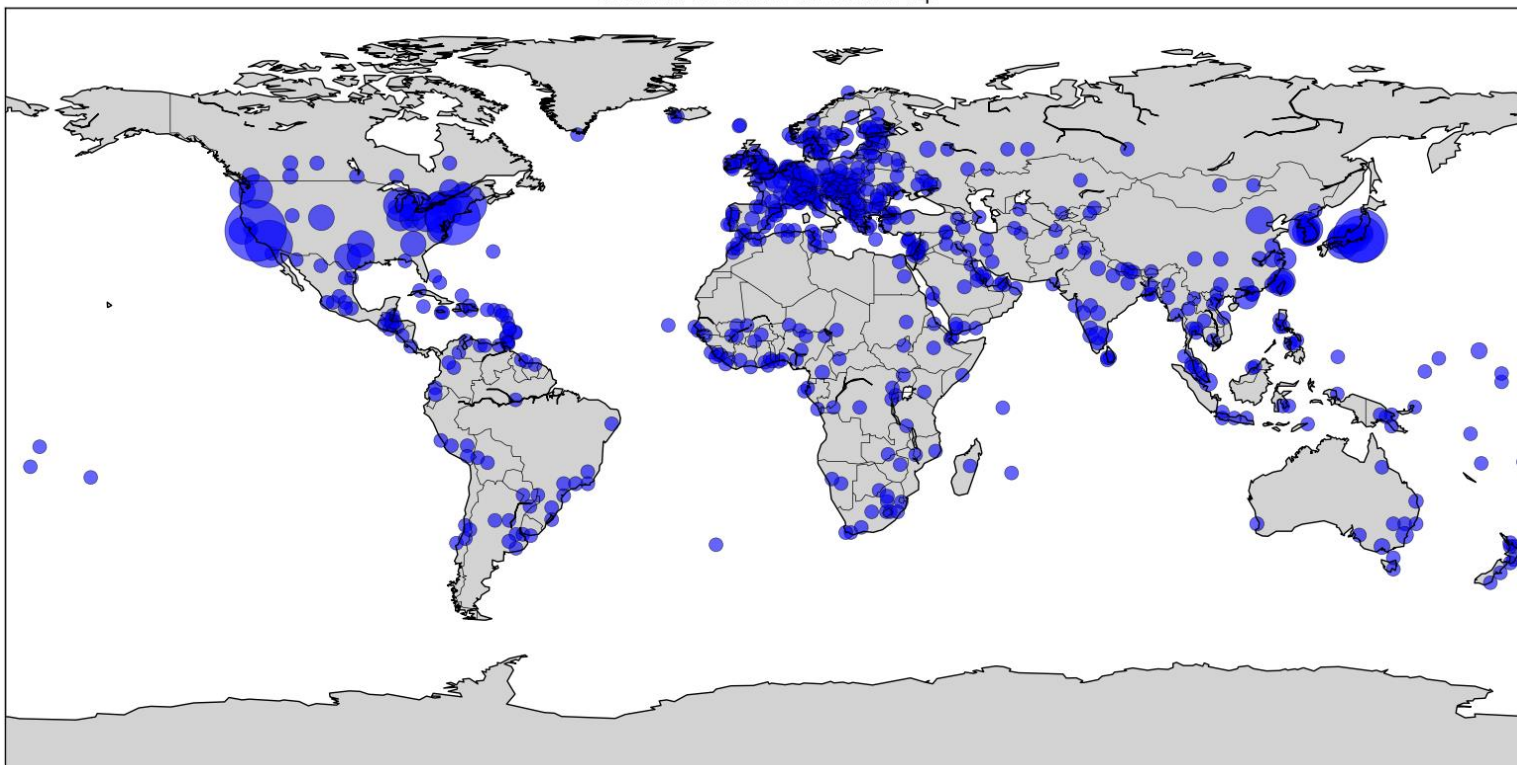
Note: PMEs calculated using Kaplan-Schoar methodology and S&P 500 as referenced public index. As of Q1 2023.
Source: State Street Private Equity Index, accessed October 10, 2023.

But geographically concentrated



As is the case globally

Inventor Locations on World Map



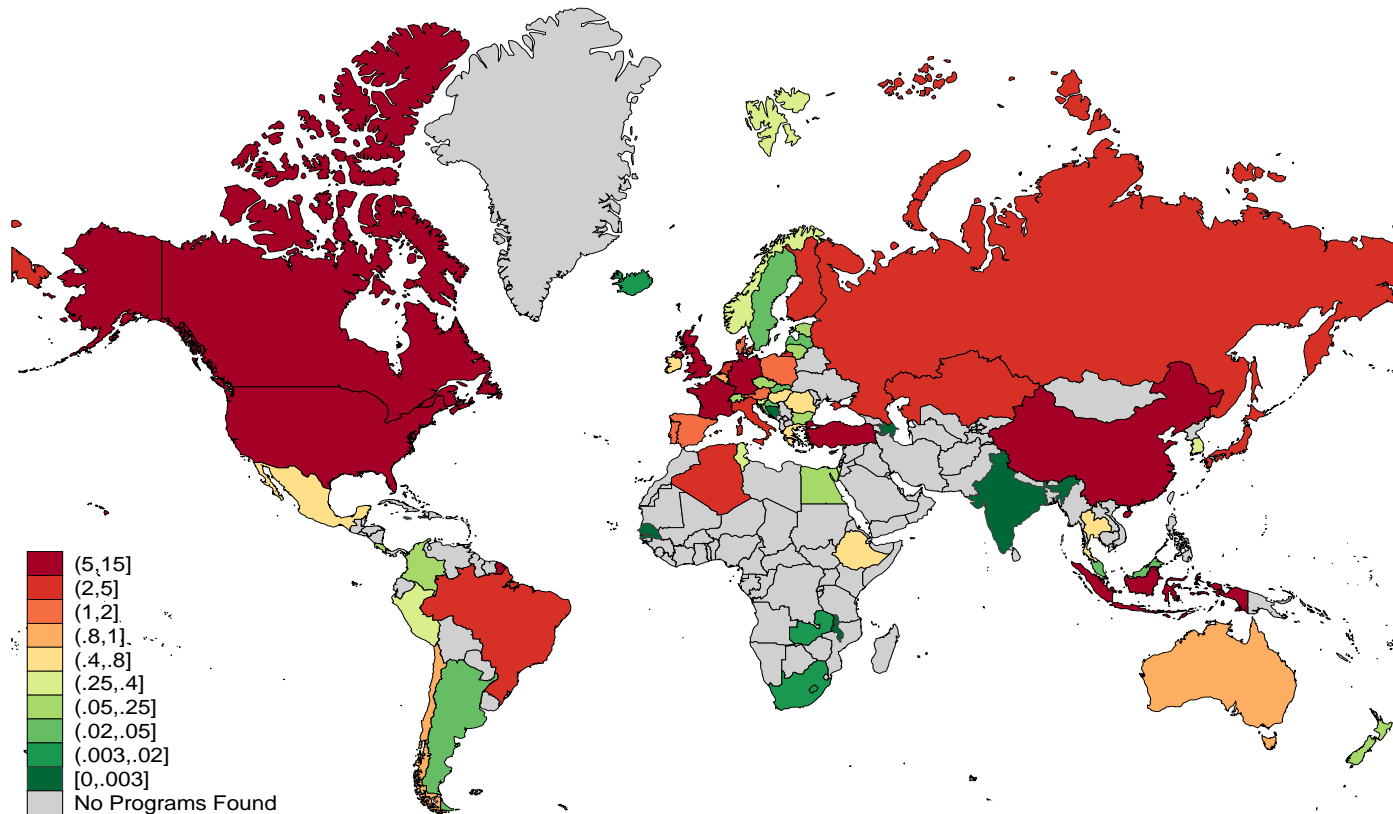


2. But policy challenges linger

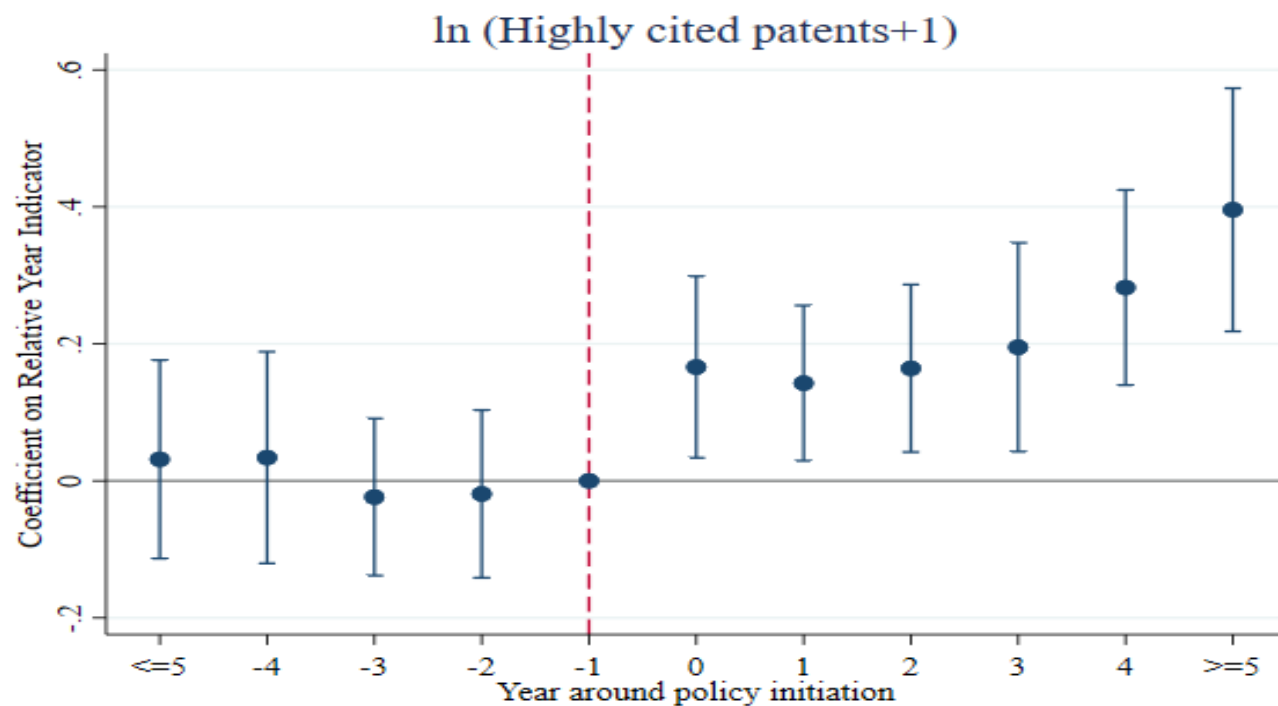
Government as investor

- Not really new!
 - In the U.S.:
 - Critical role of SBIC program.
 - Established in 1958.
 - Many early VC firms started as SBIC awardees, then opted out.
 - Building critical “infrastructure”: Lawyers, data providers, *etc.*
 - Similar insights from Israel, Singapore, *etc.*
 - Suggests that some funding should be directed to growing industries
- But more mixed elsewhere!

Annual budgets, entrepreneurial finance programs (\$B), 1995-2019



Appears to have an impact!



But fundamental challenges

- Incompetence:
 - Often, government officials have relatively little familiarity with worlds of entrepreneurship and venture capital.
 - Many well-intentioned efforts are poorly executed:
 - Either make it impossible for firms to take advantage of or leave themselves vulnerable to “gaming” by participants.
- “Capture”:
 - Public efforts can be directed to well-connected parties, who seek to benefit themselves or a non-fiduciary greater good.
 - Need for policy makers and programs to be independent.

And the dangerous “law of unintended consequences”

- The promise of government money can affect VC incentives.
 - When the U.S. provided billion-dollar grants for clean energy after the GFC, huge market distortions.
 - No clear criteria for awards and huge grant size led to lots of “influence activities”:
 - Over 50% of NEA’s cleantech companies hired lobbyists!
 - VCs actually held off investing!
 - Didn’t want to put their money in if the company would get a grant.
 - And didn’t want to invest in a company that didn’t get a grant and had to compete with others that did.



Three key principles

- Making sure table is set.
- Incorporating the market into program design.
- Avoiding self-defeating design errors.



Legal and financial environment

- Legal framework: Large literature demonstrates correlation between financial development and legal quality indices:
 - Legal enforcement
 - Minority shareholder protection
 - True for entrepreneurship as well...
- Stock market development
 - Availability of 2nd tier markets
 - Listing and disclosure requirements



Labor supply

- Entrepreneurship education for students and professionals alike.
- Easing formal and informal sanctions on involvement in failed ventures.
 - Singapore's Phoenix award.
- Easing barriers to technology transfer.
- Easing barriers to foreign knowledge:
 - Start-Up Chile influential example.

Labor mobility

- Affects decision to start-up & ability to hire and fire employees.
- Cross-country differences:
 - Countries with high employment protection have less VC
 - Countries that replace protection with insurance have more VC
 - Bozkaya & Kerr (2011)
- Within US, states that have loose enforcement of non-competes have...
 - More start-ups
 - Attract more star innovators
 - Effects appear to be causal:
 - Marx, Strumsky and Fleming (2009).

Taxation

- Capital gains taxation
 - Supply-side effect limited when LPs tax-exempt
 - Demand-side effect can be substantial
 - US rate reduction in 80s & 90s increased VC (Gompers and Lerner 1998)
 - Differential between income and capital gain tax matters in European data (Da Rin et al. 2006)
- Treatment of stock options.
- How important is taxation of GP's carried interest?
 - GP/LP contract terms adjust more flexibly to market conditions than previously believed (Robinson & Sensoy 2011)

Sources: Marco Da Rin, Giovanna Nicodano, and Alessandro Sembenelli, "Public Policy and the Creation of Active Venture Capital Markets," *Journal of Public Economics*, 90 (2006), 1699-1723; Paul Gompers and Josh Lerner, "What Drives Venture Capital Fundraising?" *Brookings Papers on Economic Activity: Microeconomics*, (1998) 149-192; David T. Robinson & Berk A. Sensoy, 2013. "Do Private Equity Fund Managers Earn Their Fees? Compensation, Ownership, and Cash Flow Performance," *Review of Financial Studies*, vol 26(11), pages 2760-2797.



2. Incorporating the market into program design

- Need to listen to market's dictates:
 - Danger of building something people don't want/need.
 - Matching funds most appropriate way to ensure.
 - Limits danger of going off in wrong direction...



Many matching mechanisms

- Matching funds...
 - Often with cap on government returns.
 - E.g., Israel Yozma, NZ Venture Investment Fund, INOVAR Seed Fund
- Loans and quasi-loans:
 - E.g., U.S. SBIC program.
- Loss guarantees:
 - E.g., Israel INBAL program.
- Second and third approaches raise incentive concerns.
- Last may not attract best groups.



Getting the right matches

- Ensuring international investors find venture markets consistent with international norms:
 - Crucial role in many emerging VC markets:
 - Depth of experience and resources.
 - Need to have tax and regulatory features in compliance:
 - Even appearance of difference can be deterrent!
 - Need for timely and meaningful data:
 - Given information gaps, critical to LPs.
- Taking advantage of those elsewhere:
 - Expatriates can be of real value in many ways, e.g.:
 - Angel investors.
 - Mentors to/champions of local VCs.
 - Advisors to policymakers.

The gold standard.



- When Yozma was founded, entrepreneurs were suspicious of VC and there was only a single venture fund in the nation.
 - Entrepreneurs relied on bank debt, and many struggled to bring technically successful products and ideas to market.
- Yozma succeeded in its goal of leveraging foreign VC expertise and networks.
 - By matching 40% of funds raised for Israel-focused vehicles.
 - While actively discouraging Israeli financiers from participating.
- The project was a runaway success.
 - After five years, GPs could buy out the gov't stake for cost plus nominal interest.
 - All but one did.
 - Participating VCs earned spectacular returns, and Israel's VC market expanded to include 60 groups managing around \$10bn.
 - Tellingly, Israel's ratio of VC investment to GDP is now the highest in the world.

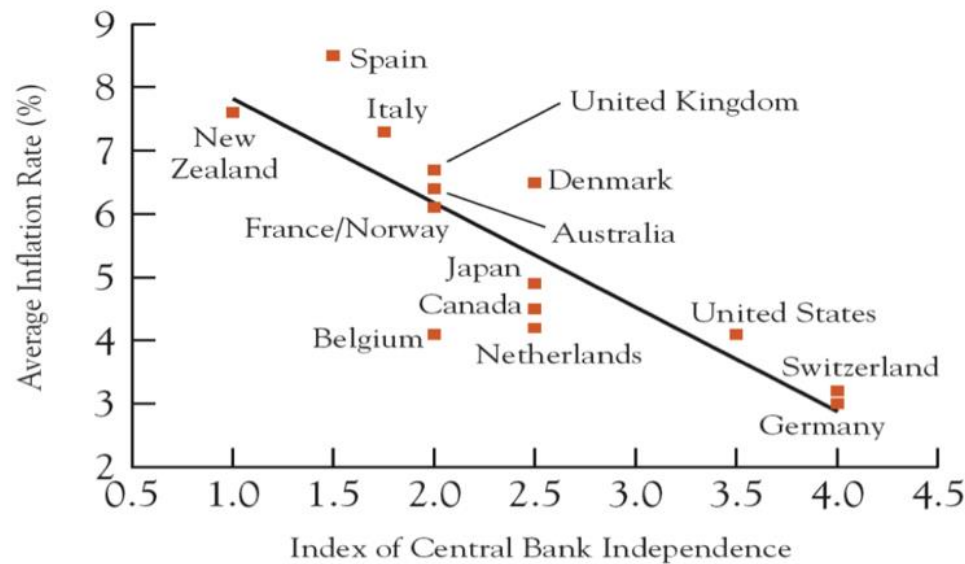


3. Getting details right

- Appropriate sizing:
 - Too small may not make a difference.
 - Too big may flood local investors.
- Avoiding rules that go against what market needs.
- Need for incentives to ensure participants do well if they meet goals.
- Evaluation of managers and program itself.
- Staying power...
 - But allowing programs to evolve and adjust over time.

Independence: A good thing for central banks...

- Decades of economic research have affirmed the importance of the independence of monetary policy from political influence.
 - So central bankers are not incentivized to “do the wrong thing” ahead of an election.



Source: Alesina, Alberto, and Lawrence H. Summers. "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence." *Journal of Money, Credit and Banking* 25, no. 2 (1993): 151–62.

...and for VC policy making.

- The literature has made a similar argument for venture capital policymaking.
 - Independence from political fashions of the moment allows leadership to implement objective decision-making for the long term.
- Avoids pressures to do certain deals, to push firms for quick results, etc.
- New Zealand Venture Investment Fund example of such independence:
 - Modelled to some extent off Canadian Pension Plan Investment Board's independence.

Summary: “Public venture capital”

- This isn't easy:
 - Compelling case for government interventions.
 - But enormous market uncertainty today.
 - Lots of information gaps, even in the best of times.
 - Need to act quickly.
- Think carefully about program design:
 - Incentives really matter here.
 - Independence and matching funds as two key touchstones.
- Think carefully about program targets:
 - Is there a clear and compelling “market failure”?
 - More generally, where does the venture industry have an “unfair advantage”?

Thank You!



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