May 22, 2024

The Rise (and Decline) of Venture Capital in China and its Global Implications

Josh Lerner

Jacob H. Schiff Professor

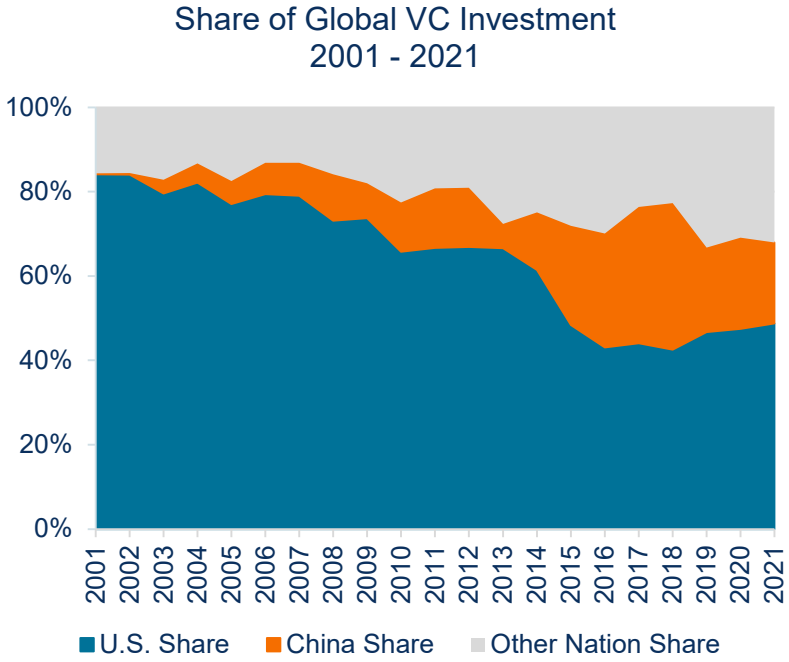
Harvard Business School and Private Capital Research Institute

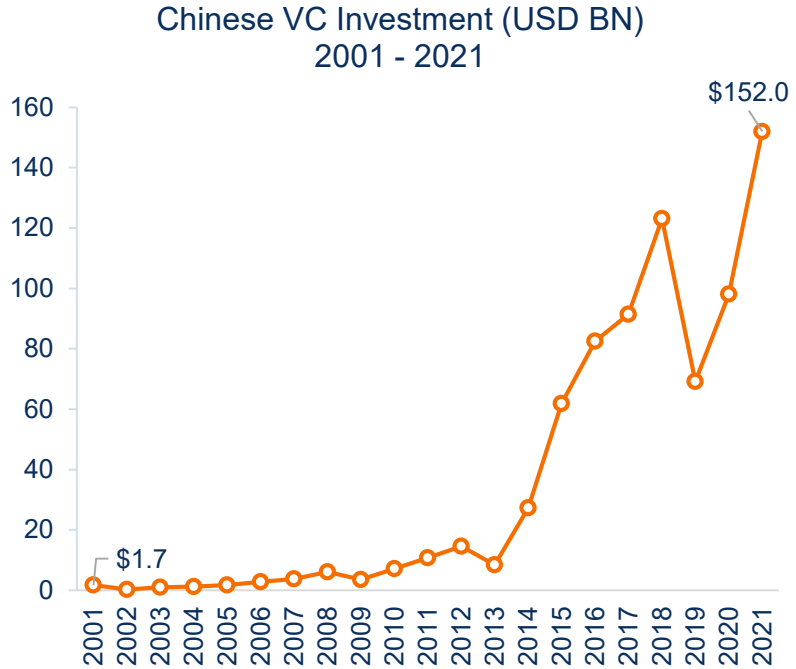
josh@hbs.edu

www.hbs.edu/faculty/jlerner

Asian Bureau of Finance and Economic Research 11th Annual Conference

Extraordinary rise of VC in China in 2010s…





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. 32193, 2024; Preqin, accessed on March 27, 2024.

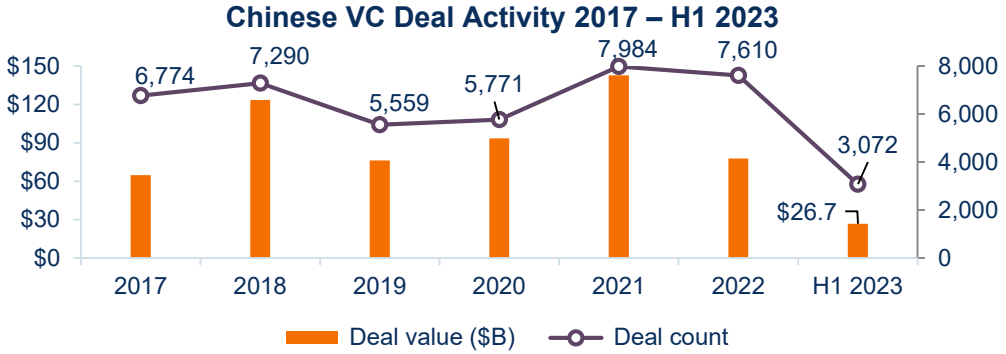
… driven by high returns…

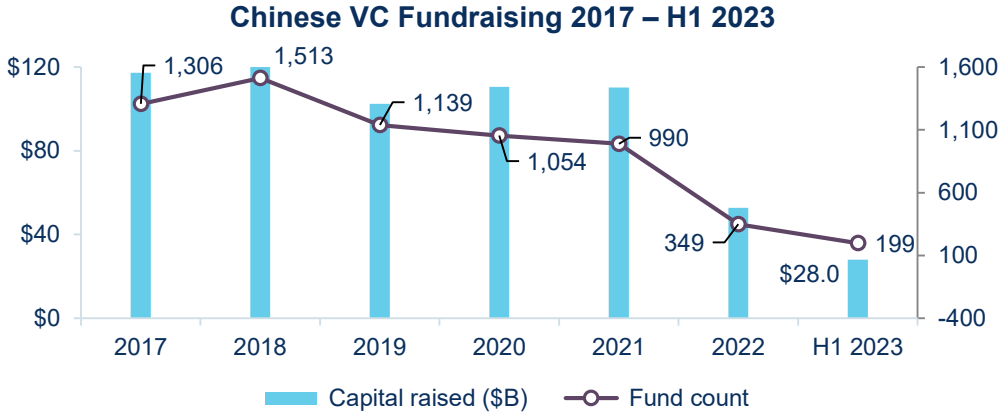
10-year VC fund historical IRR and PME by region, 2008 - 2017		
Region	**IRR**	**PME***
China	**16.16%**	**1.20**
India	10.32%	0.94
US	9.53%	1.06
Pan-Asia	8.21%	1.03
Europe	4.63%	0.91
Middle East	4.32%	0.80
Canada	4.28%	0.83

*Note that PME is calculated using the Kaplan-Schoar approach, showing relative performance of venture funds by region to the S&P 500 index. Values > 1 indicate better performance than the S&P 500 over the same period.
Source: Leslie Jeng and Josh Lerner, "The Great Venture Capital Reversal: Insights from Harvard University and the Private Capital Research Institute," *Private Equity Insights Q2 2017*, State Street, 2017.

… was followed by a sharp reversal in investments…

- **After the accelerated growth in the 2010s, recent activity in China's VC market has declined and remained subdued.**
  - Greater pressure on groups in investment selection and strategy.
  - Delays in achieving liquidity.

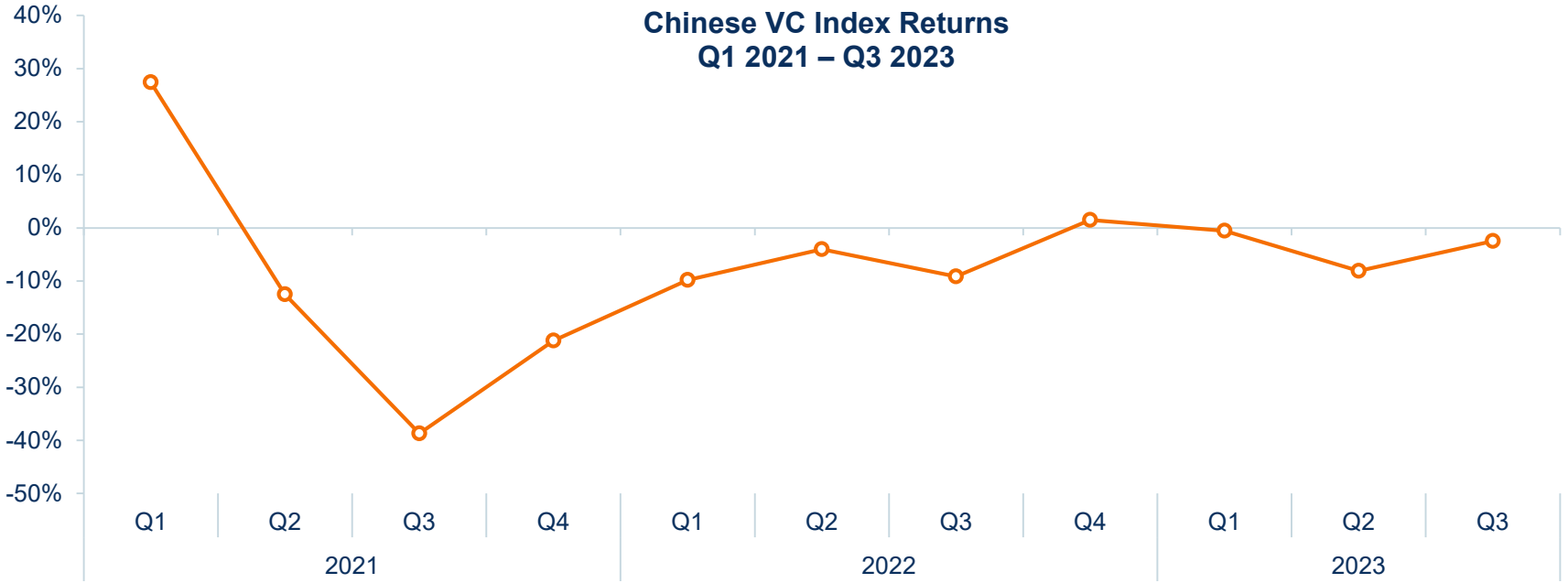




Source: "Pitchbook H1 2023 Greater China Venture Report," September 15, 2023.

… and returns…

- Since Q1 2021, Chinese VC index returns have either been negative or hovering around 0%.

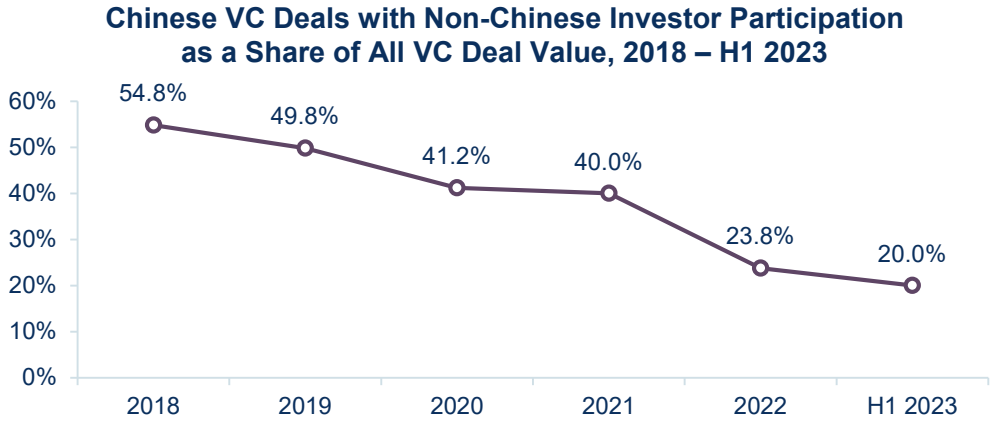


Source: Cambridge Associates, accessed March 27, 2024.

… and foreign investors into Chinese VC have largely retreated.

- **The number and amount of Chinese VC deals in which non-Chinese investors participated fell dramatically in 2022 and 2023.**

- **As a percent of all deal value, foreign participation has steadily decreased from the 2018 peak in which over half of Chinese VC deals by value had non-Chinese investors involved.**
  - To only a fifth in 2023!



Source: "Pitchbook H1 2023 Greater China Venture Report," September 15, 2023.

Should we care? Two opposing perspectives

Global investment in innovation and entrepreneurship has traditionally been concentrated in high-income countries

Slow or absent technology diffusion to rest of the world is a dominant explanation for vast global differences in income and productivity (Keller, 2004)

Does the rise of an emerging economy as a new center of global innovation affect international technology transfer and entrepreneurship?

1. No clear benefit of shifting geography of innovation

- Innovation in high-income countries is broadly applicable and local barriers to technology adoption — independent of where the technology is developed — are the primary obstacle to development Parente and Prescott (1994), Barro and Sala-i Martin (1997)
- "Leapfrogging" can lead countries to accelerate development Lee and Lim (2001), Tonby et al. (2020)

2. Benefits due to shift in the focus and global "appropriateness" of technology

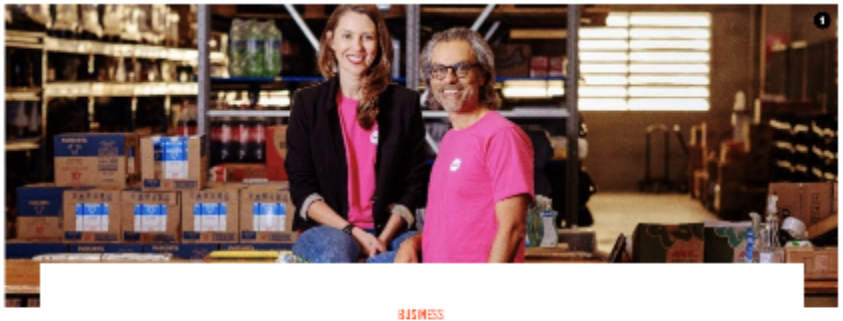
- Technology designed in and for rich countries can remain *inappropriate* in much of the world Basu & Weil (1998), Acemoglu & Zilibotti (2001), Kremer (2002), Moscona & Sastry (2023)
- The rise of a new center of innovation may have major consequences by shifting the global focus of innovation and developing technologies suited to a different set of contexts

An example: start-ups geared toward elementary and secondary education

Surge in Chinese investment in mid-2010s, motivated by high demand for education and limited brick & mortar schools in much of the country

Followed by emerging market boom, most notably in India

Conscious emulation of Chinese business models among local investors



BUSINESS

Social commerce platform Favo empowers an entrepreneurial partners' network in Brazil and Peru

Social commerce, Favo's business model, was born in China and seeks to strengthen e-commerce through the networks of people who live in the same region (city, neighborhood, condos).

-Latin American Business Stories

Following VC leaders as industry benchmarks

Investment decisions are made under conditions of great uncertainty and information asymmetries (Gompers and Lerner, 1999)

- Contract design does not address these issues (Kaplan and Stromberg, 2003)
- As a result, VCs often rely on recognition of prior success factors to assess the attractiveness of business models and people
- Traditionally, benchmark companies solely from the US…but growing number of examples from China

For all the obvious cultural and geographic differences, [companies in China and other emerging markets] have navigated challenges not contemplated in the West---navigating particularly hard last mile logistics, dealing with rapidly changing regulatory regimes, educating millions of consumers to use fintech […] It should come as no surprise that massively successful companies in China are often models for how it is done to the rest of the world as much as Silicon Valley.

-Christopher Schroeder, Venture Investor focused on the Middle East

Venture deals around the world

PitchBook: key global venture capital database:

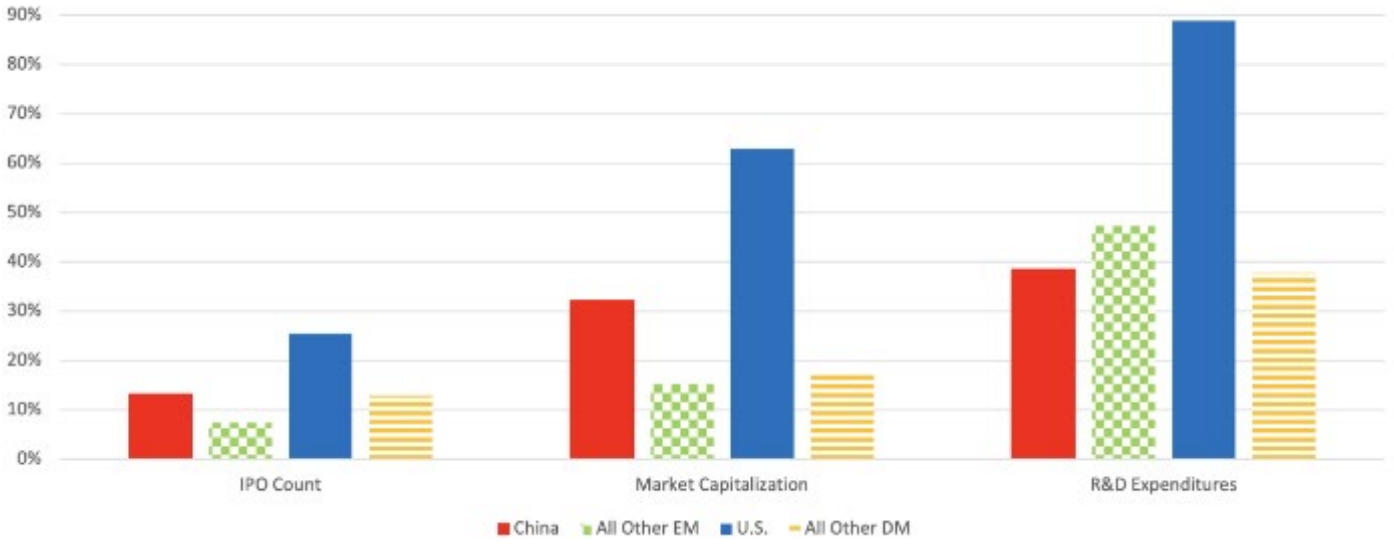
- Gathered through firm/fund contacts, news stories, and regulatory filings
- Designed from the beginning to have world-wide coverage
- Relied on for international comparisons by U.S. National Science Board, others
- Information on each financing round size + capital providers; short company descriptions

Focus on:

- Period from 2001 to 2021
- Deals categorized by Pitchbook as “Early-Stage VC” or “Later-Stage VC”
- Categorize into indsutries with the help of ML techniques.

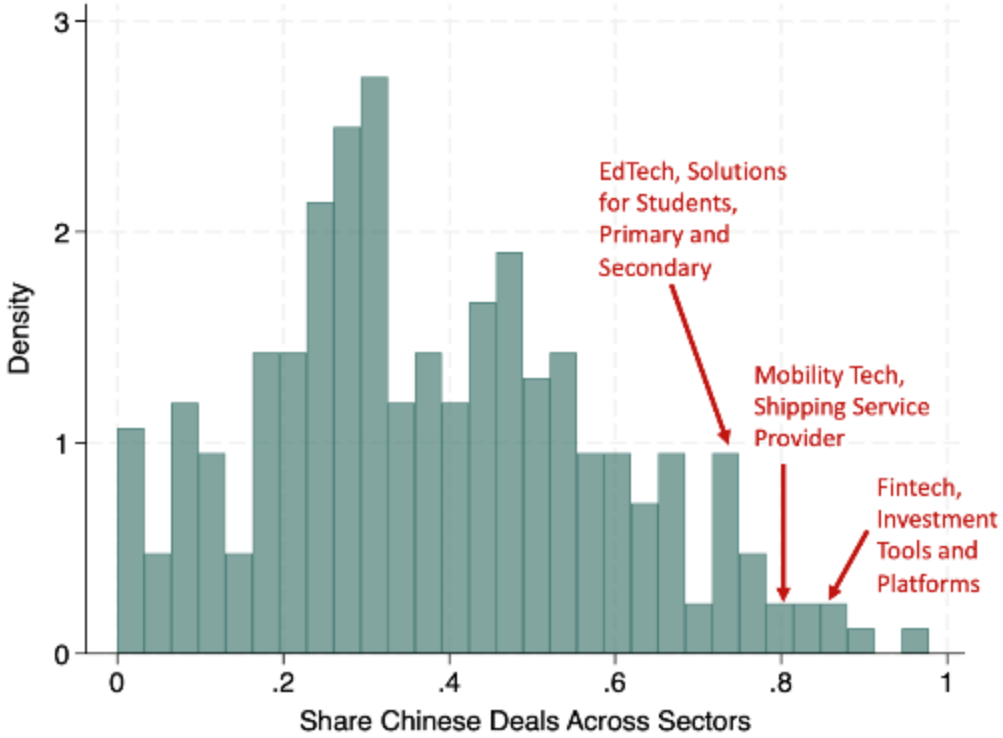
Summary statistics

Follow Lerner and Nanda (2020)'s methodology for the U.S., identifying the share of young and publicly traded firms HQ'd in each country that are venture backed



Also…in developing countries outside China, VC-backed firms account for 31% of citation-weighted patenting from 2013-2022, 42% in knowledge-intensive patent classes

Defining "China-led" sectors



Main analysis: define "China-Led" sectors as those with *above median* Chinese deals

Additional analysis: define "China-Led" sectors as those with a *majority* Chinese deals

"Suitability" of Chinese entrepreneurship

Goal: Develop sector-by-country measure of the appropriateness of Chinese entrepreneurship

1. Compile all development indicators x from the World Bank's database
2. Assign each indicator to relevant macro sector(s) $\mathcal{S}_i$ (EdTech, AgTech, etc.)

- E.g., School enrollment rates are relevant to the Education Tech macro-sector

3. Normalize each characteristic to comparable, z-score units:

$$\hat{x}_c = \frac{x_c - \mu(x_c)}{\sigma(x_c)}$$

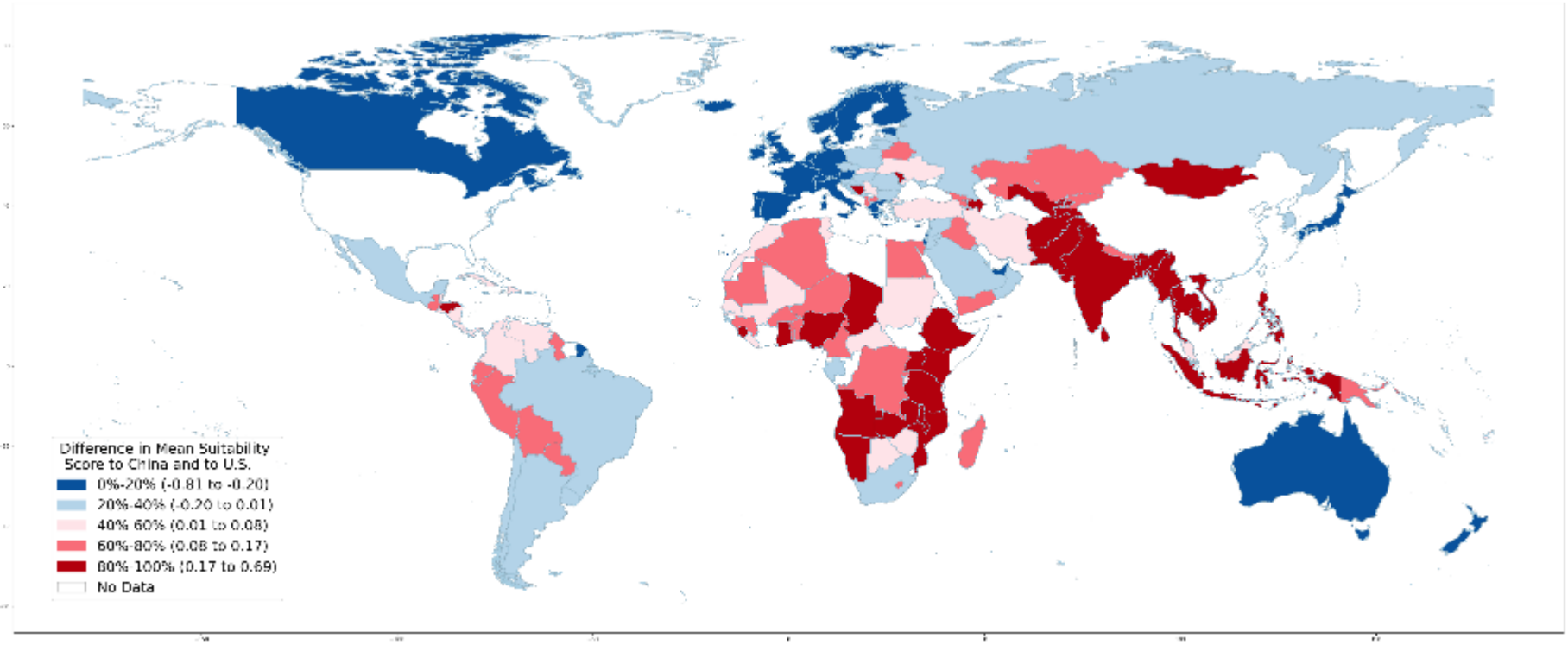
4. Define "mismatch" with China for $s \in S_i$ as follows for all sectors and countries:

$$M_{cs} = \frac{1}{|\mathcal{S}_i|} \sum_{x \in \mathcal{S}_i} |\hat{x}_c - \hat{x}_{China}|$$

5. To convert to a "suitability" measure, simply subtract M_{cs} from its maximum.

Cross-country variation

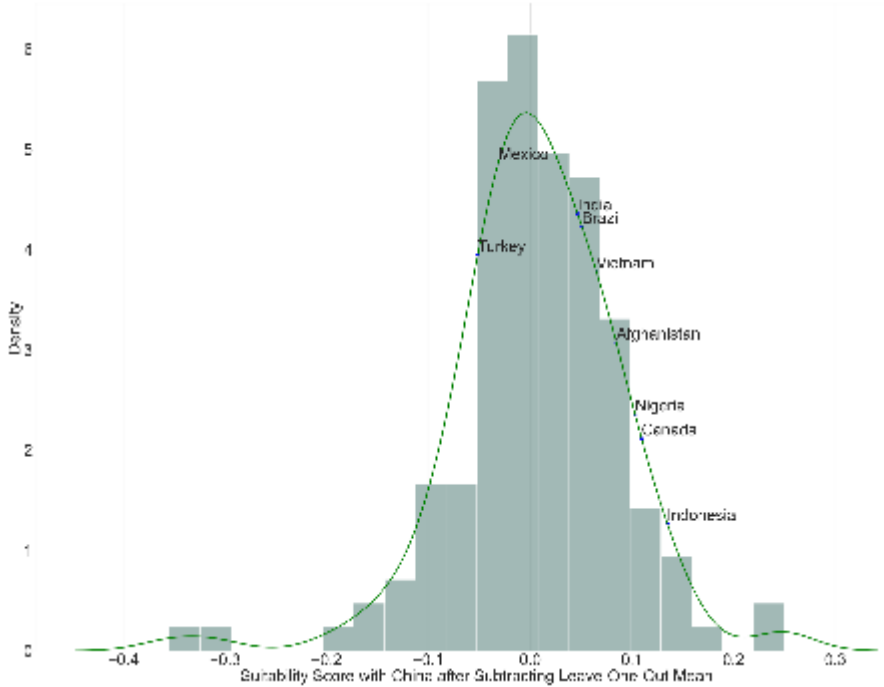
Gap between China-suitability and US-suitability



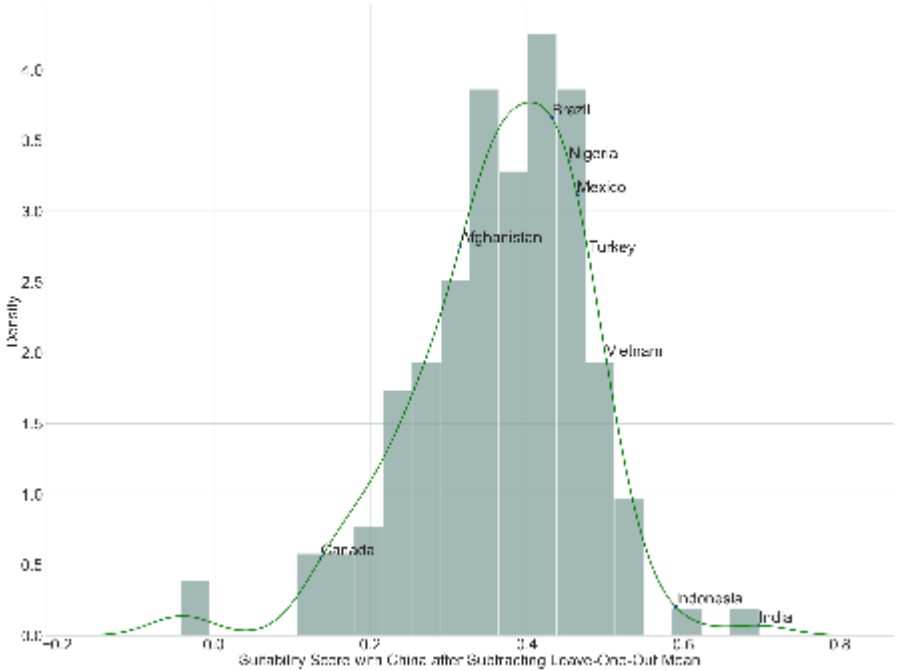
On average, China is 0.565 standard deviations more similar to developing countries than the US

Cross-sector variation

Substantial variation across sectors, within countries



(a) China-suitability in AgTech

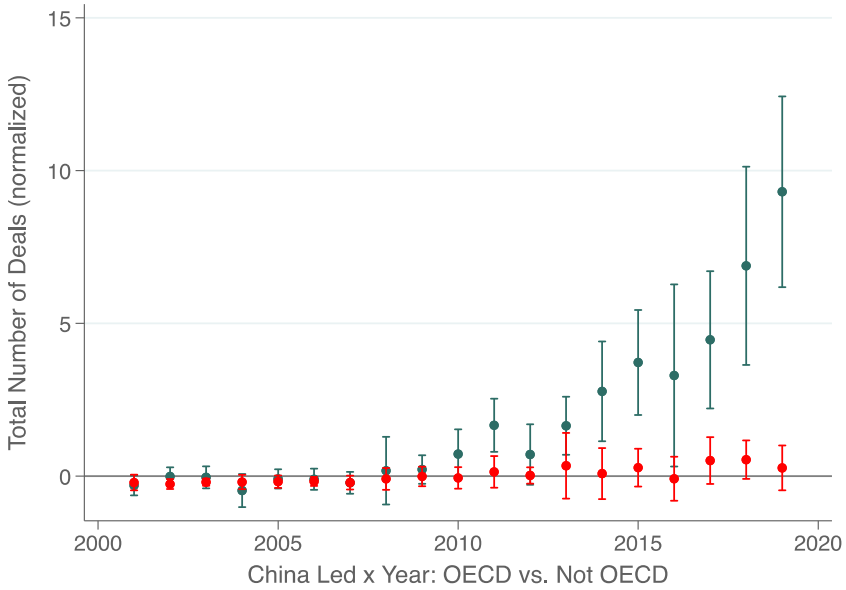


(b) China-suitability in FinTech

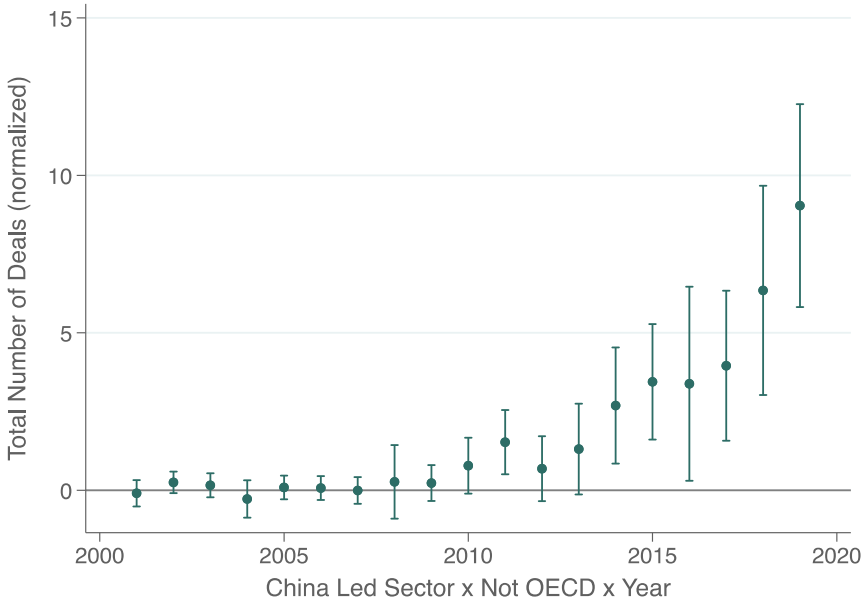
Max-Min Gaps

Descriptive evidence: EMs follow China

$$y_{cst} = \sum_{\tau}(\beta_{\tau} * \text{ChinaLed}_{s} * \delta_{\tau} * \text{EM}_{c}) + \alpha_{cs} + \gamma_{ct} + \theta_{st} + \epsilon_{cst}$$



(a) Separate effects for EM and non-EM



(b) Triple-difference estimates

Pooled Estima

Estimating equation

Goal is to assess whether global spread of China-led sectors is driven by differences in the potential suitability of Chinese technology

Estimating equation:

$$y_{cst} = \beta\ (\text{ChinaLed}_s * \text{Post}_t * \text{ChinaSuitability}_{cs}) + \alpha_{cs} + \gamma_{ct} + \delta_{st} + \epsilon_{cst}$$

$\text{ChinaSuitability}_{cs}$ is the measured suitability of Chinese technology in country c and sector s; Post_t = 1 after 2013

Our hypothesis is that $\beta > 0$. Again, may not be the case…

- Diffusion driven by something other than appropriateness (e.g. politics, geography)
- First result captured sector-level trend in EMs, not diffusion from China

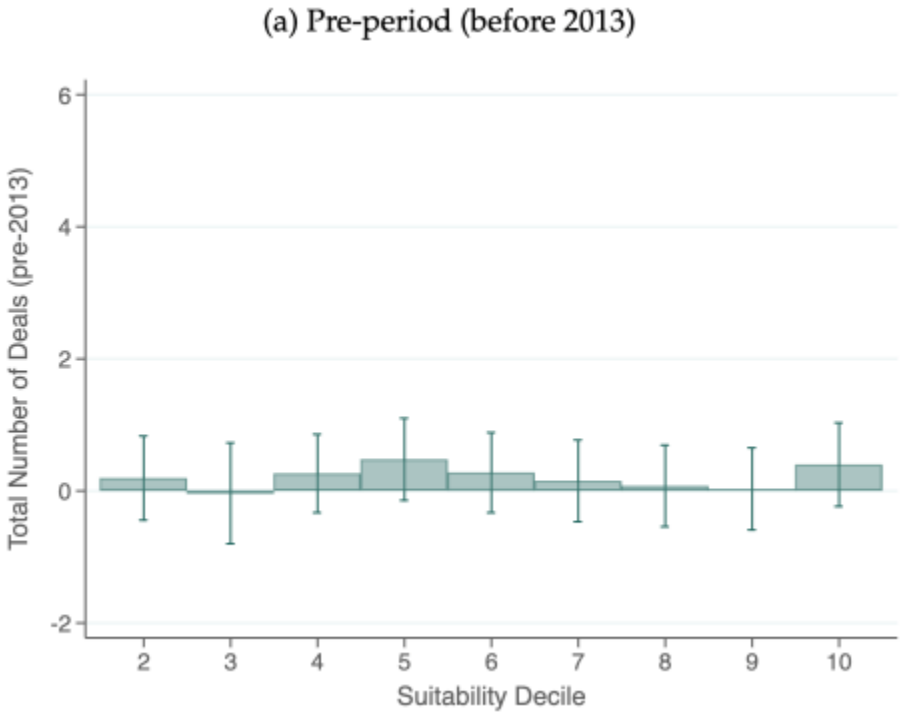
Appropriateness and entrepreneurship

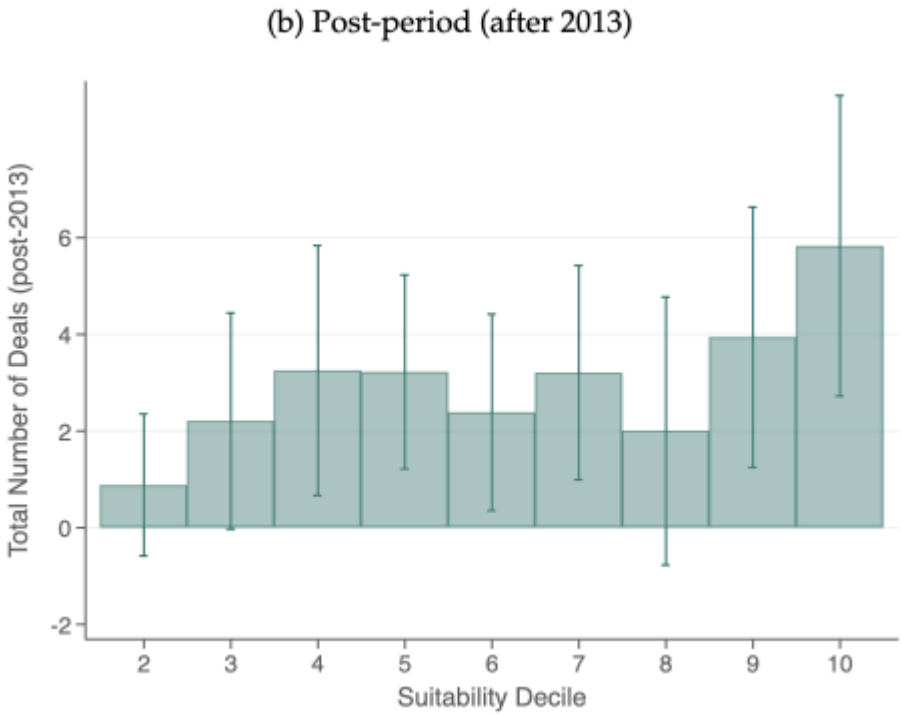
	Dependent Variable: Number of Deals (Normalized)			
	(1) Full Sample	(2) Full Sample	(3) Bottom Quartile Suitability	(4) Top Three Quartiles Suitability
China-Led Sector × Post × China Suitability	8.238***	7.827**		
	(2.902)	(3.023)		
China-Led Sector × Post × EM			0.149	4.976***
			(1.697)	(0.961)
Sector × Country Fixed Effects	Yes	Yes	Yes	Yes
Country × Year Fixed Effects	Yes	Yes	Yes	Yes
Sector × Year Fixed Effects	Yes	Yes	Yes	Yes
Sector × Year × EM Fixed Effects	No	Yes	No	No
Number of Obs	552300	552300	124440	475200
Mean of Dep. Var	3.588	3.588	3.033	3.726
SD of Dep. Var	44.979	44.979	38.363	47.572

One SD higher "suitability" leads to a **near tripling** of deal counts in China-led sectors

With additional assumptions…the rise of China increased EM entrepreneurship by **26-42%**

Effect by suitability decile: pre vs. post period

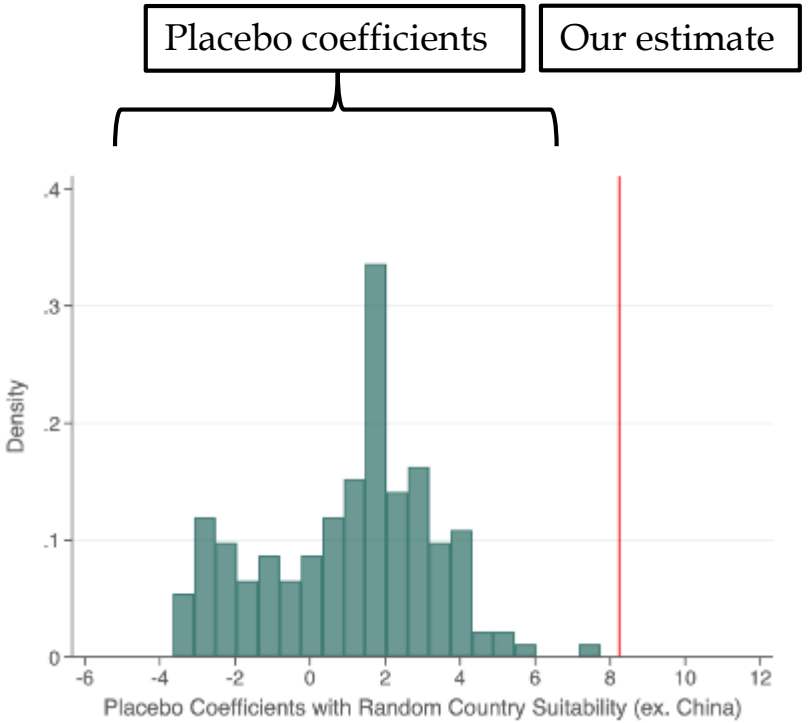




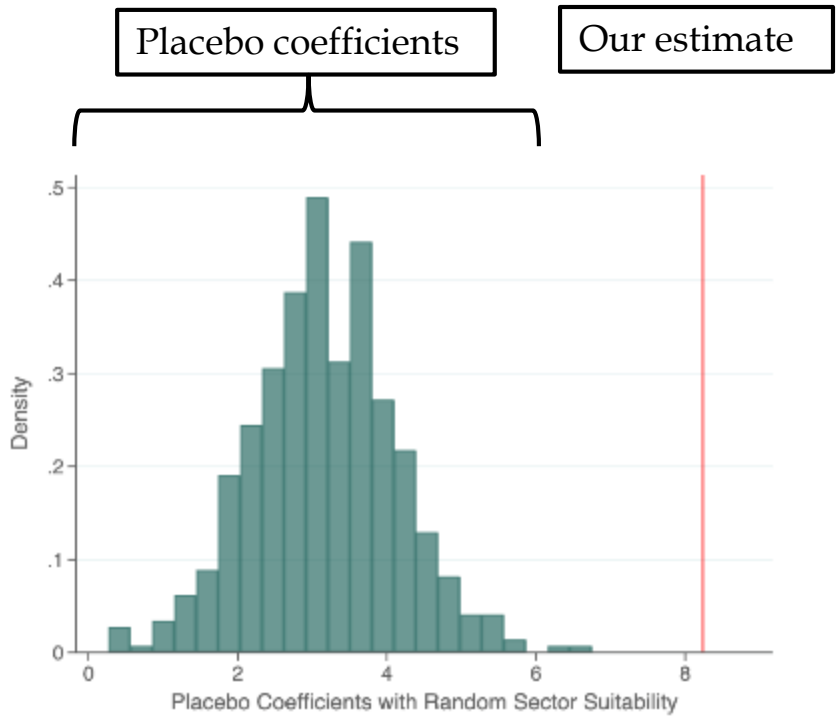
No difference during pre-period…positive relationship between suitability decile and venture activity after 2013

Yearly event stu

Falsification tests



Are the results truly driven by suitability of *China*?



Are the results truly driven by differences in suitability *across sectors within countries*?

Emulating Chinese businesses

	Text similarity to existing Chinese companies in the sector	
	(1) Mean Similarity	(2) 90th Percentile Similarity
China-Led Sector × Post × China Suitability	0.010**	0.014***
	(0.005)	(0.005)
Sector × Country Fixed Effects	Yes	Yes
Country × Year Fixed Effects	Yes	Yes
Sector × Year Fixed Effects	Yes	Yes
Number of Obs	42536	42536
Mean of Dep. Var	0.506	0.614
SD of Dep. Var	0.094	0.099

Notes: The unit of observation is a country-sector-year. The dependent variable is defined at the top of each column. Standard errors are clustered by country and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Funding sources

	(Normalized) Number of Deals from		
	(1) Investors from US	(2) Investors from China	(3) Investors from Own Country
China-Led Sector × Post × China Suitability	1.087	0.880	4.455***
	(1.295)	(0.565)	(1.604)
Sector × Country Fixed Effects	Yes	Yes	Yes
Country × Year Fixed Effects	Yes	Yes	Yes
Sector × Year Fixed Effects	Yes	Yes	Yes
Number of Obs	552300	552300	552300
Mean of Dep. Var	0.803	0.079	1.716
SD of Dep. Var	19.497	4.150	26.571

Notes: The unit of observation is a country-sector-year. The dependent variable is defined at the top of each column. Standard errors are clustered by country and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

A bit of everyone, but especially **local investors**

Is it the politics, stupid?

	Dependent Variable: Number of Deals (Normalized)					
	(1) Top Quantile UN Vote Similarity	(2) Bottom Quantiles UN Vote Similarity	(3) Top Quantile Polity Score Similarity	(4) Bottom Quantiles Polity Score Similarity	(5) Govt Prioritized Sectors	(6) Not Prioritized Sectors
China-Led × Post × China Suitability	11.734**	7.459**	9.949*	7.732***	2.600	9.751***
	(5.743)	(3.120)	(5.542)	(2.774)	(2.600)	(3.616)
Sector × Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs	139127	411332	118613	380824	174300	378000
Mean of Dep. Var	4.514	3.289	3.350	3.130	4.628	3.108
SD of Dep. Var	54.283	41.465	46.049	40.832	51.643	41.540

Notes: The unit of observation is a country-sector-year. Each regression is estimated on a different sample, noted at the top of each column. In columns 1-4, some countries are excluded from each specification, and in columns 5-6, some sectors are excluded from each specification. Standard errors are clustered by country and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Effects for both China's "friends" and China's "enemies"

Are the results driven by failed companies?

	Outcome is (normalized) number of deals for companies that end up		
	(1) Failure	(2) Acquired / IPO	(3) Neither (yet)
China-Led Sector × Post × China Suitability	0.525	1.204**	6.510***
	(0.791)	(0.557)	(2.241)
Sector × Country Fixed Effects	Yes	Yes	Yes
Country × Year Fixed Effects	Yes	Yes	Yes
Sector × Year Fixed Effects	Yes	Yes	Yes
Number of Obs	552300	552300	552300
Mean of Dep. Var	0.507	0.496	2.584
SD of Dep. Var	16.311	13.803	38.142

Notes: The unit of observation is a country-sector-year. The dependent variable is defined at the top of each column. Standard errors are clustered by country and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Positive effects on city-level entrepreneurship

Dependent variable is the normalized number of	All Companies	Companies in China-Led Sectors	Companies in Non-China-Led Sectors	All Companies	Patents	
	(1)	(2)	(3)	(4)	(5)	(6)
Regression sample:	EM	EM	EM	Full	EM	Full
Share of China-Led × Post	0.734***	0.615***	0.119***	0.084**	0.321***	0.072
	(0.164)	(0.142)	(0.030)	(0.039)	(0.098)	(0.052)
Share of China-Led × Post × EM				0.650***		0.249**
				(0.167)		(0.110)
Number of Obs	1150	1150	1150	5139	1150	5139
Mean of Dep. Var	0.153	0.132	0.021	0.048	0.077	0.026
SD of Dep. Var	0.243	0.214	0.044	0.135	0.205	0.107
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year × EM FE	-	-	-	Yes	-	Yes

Notes: The unit of observation is a city-year. EM countries are defined as countries not included in the OECD as of 1980. *Share of China-Led* denotes the share of VC-backed companies in the city that are in one of the China-led sectors during the pre-analysis period. Cities with at least 20 companies founded during the pre-analysis period were included in the analysis. In column 2, the outcome is constructed using only companies that are classified into at least one China-led sector. In column 3, the outcome is constructed using only companies that are classified into no predicted China-led sectors. Standard errors are clustered by city and year×country, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Dynamics Full

Conclusion

Does the rise of a more "appropriate" innovation hub facilitate technology diffusion, business formation, and development in emerging markets?

Focus on high-impact entrepreneurship and the dramatic rise of China

Had a large impact on developing countries

- Growth in entrepreneurship
- Driven by country-sector pairs most "similar" to China
- Broad impacts on entrepreneurial ecosystem and innovation

Importance of an alternative model for developing countries

- China isn't the end of the story! Model could apply to other changes in the geography of innovation

Broader questions

What will be the broader implications across developing world?

- Consequences of Chinese entrepreneurial success and its diffusion for "soft power"

What of dramatic shifts in Chinese VC policy in 2020s:

- Government money pouring into venture funds
- Increasing focus on "politically correct" investment strategies

How can the lessons from this paper inform more "pro-development" global innovation policy?