

Export Restrictions and the Ripple Effect: Evidence from U.S.-China Trade Networks

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1 Summary

Following the sanctions on their Chinese customers, U.S. upstream suppliers suffered a -2.93% CAR, while Chinese upstream suppliers saw a $+3.48\%$ CAR. A staggered-DID analysis shows that these controls spurred innovation output among Chinese upstream firms and their industry peers, primarily led by state-owned enterprises, while U.S. suppliers experienced declines in innovation output.

2 Motivation

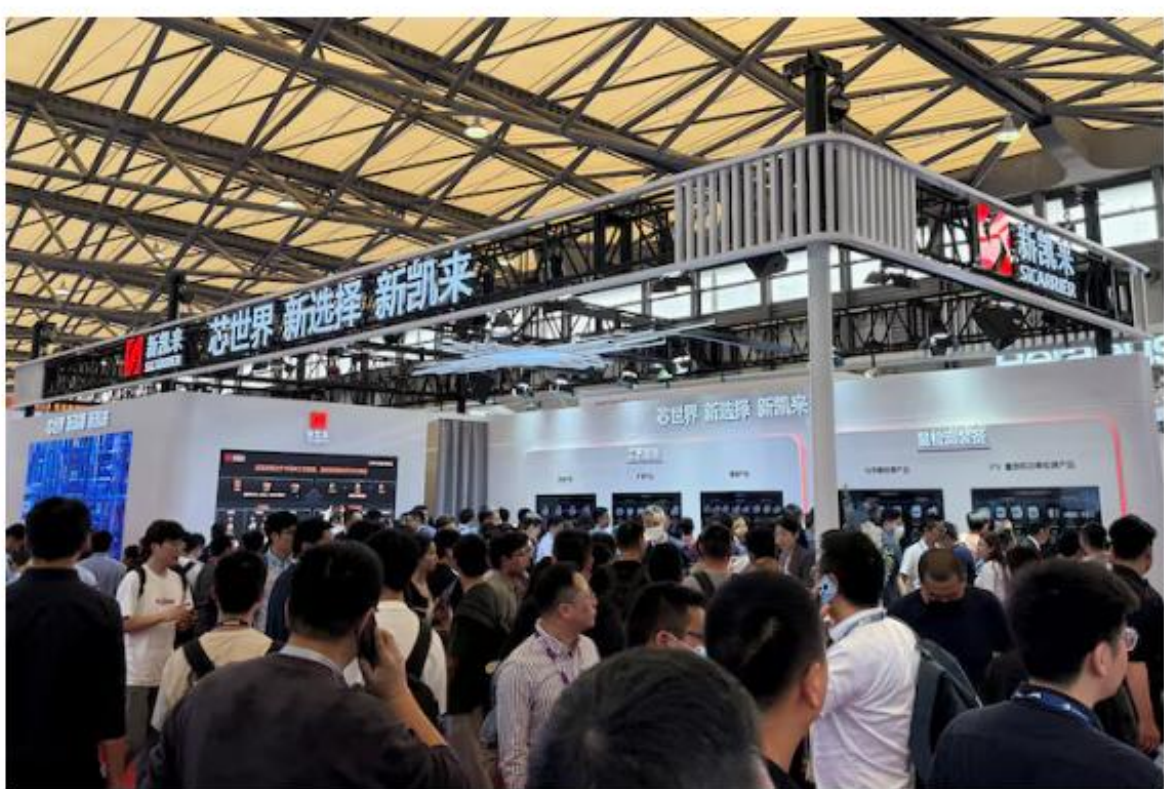
Post-sanctions, Chinese SOEs are leading innovation to replace critical intermediate imports.

Reuters World Business Markets Sustainability Legal Breakingviews Technology Investigations

SiCarrier says its tools can help China make advanced chips

By Che Pan and Brenda Goh

March 27, 2025 6:02 PM PDT - Updated a month ago

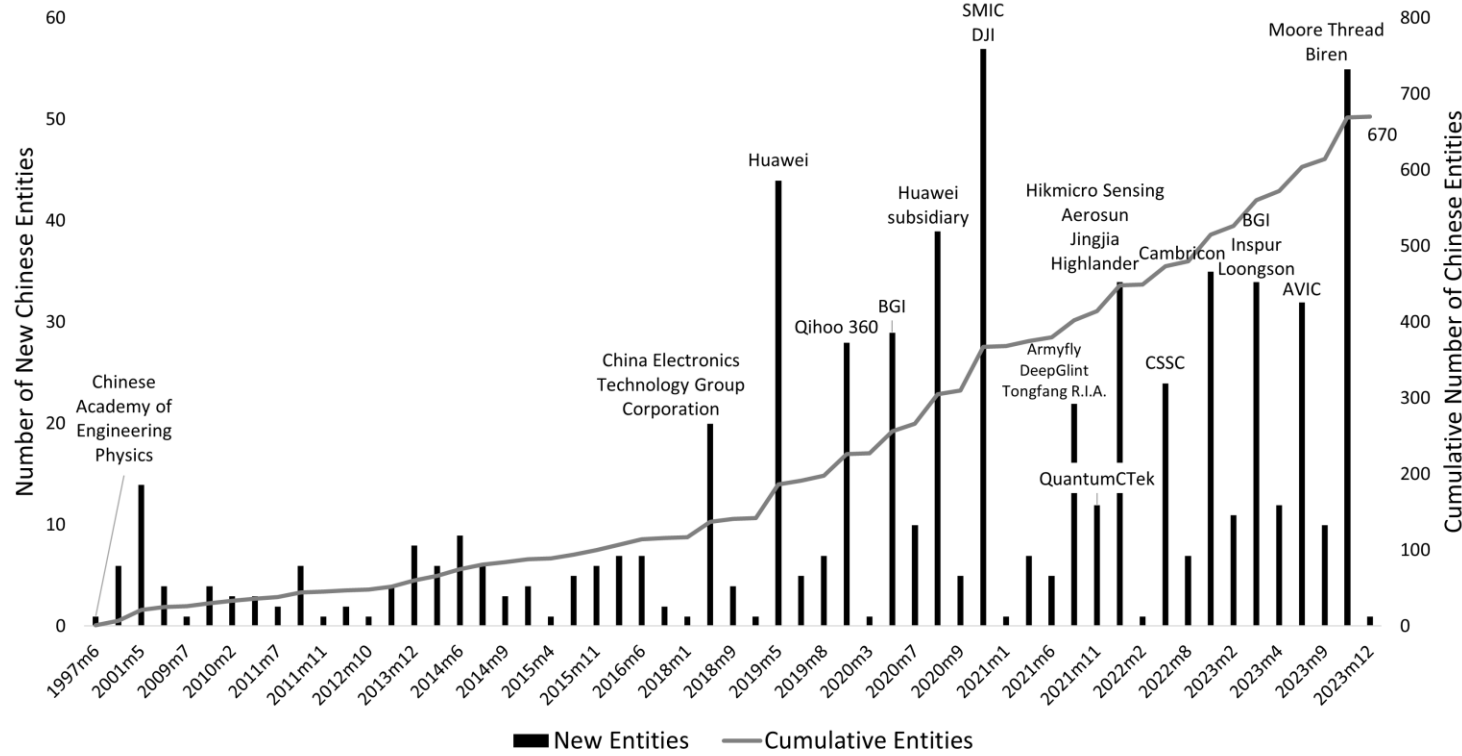


Visitors walk past the SiCarrier booth during SEMICON China, a trade fair for the semiconductor industry, in Shanghai, China March 26, 2025. REUTERS/Che Pan Purchase Licensing Rights

BEIJING, March 27 (Reuters) - China can use domestically developed tools to make advanced semiconductors, countering U.S. curbs on Beijing's access to high-end chipmaking technology, an executive at a major Chinese supplier said on Thursday.

3 Background

Chinese Firms Listed on the Entity List Over Time



6 Staggered DID Results

EL Firms: Improve Innovation Output

Callaway & Sant'Anna (2021)

Outcome	No Control		With Control	
	Wild Bootstrap	Cluster	Wild Bootstrap	Cluster
Ln(patent+1)	0.173 (0.108)	0.173** (0.086)	0.336*** (0.112)	0.336*** (0.077)
Ln(citation+1)	-0.065 (0.136)	-0.065 (0.144)	0.306* (0.166)	0.306 (0.187)
Patent/RDC	0.008 (0.008)	0.008 (0.006)	0.018* (0.010)	0.018** (0.008)

CN Suppliers: Innovation Improvement Led by SOEs

Outcome	No Control		With Control	
	Wild Bootstrap	Cluster	Wild Bootstrap	Cluster
Panel A: SOE sample				
Ln(patent+1)	0.489** (0.210)	0.489** (0.200)	0.497** (0.209)	0.497** (0.195)
Ln(citation+1)	0.269 (0.209)	0.269 (0.207)	0.328* (0.199)	0.328* (0.184)
Patent/RDC	0.027** (0.012)	0.027** (0.013)	0.028** (0.014)	0.028** (0.015)
ROA	-0.002 (0.004)	-0.002 (0.003)	0.001 (0.003)	0.001 (0.003)
Panel B: non-SOE sample				
Ln(patent+1)	0.042 (0.166)	0.042 (0.196)	0.163 (0.172)	0.163 (0.200)
Ln(citation+1)	0.089 (0.119)	0.089 (0.150)	0.114 (0.115)	0.114 (0.128)
Patent/RDC	0.007 (0.011)	0.007 (0.010)	0.026** (0.012)	0.026** (0.011)
ROA	0.009 (0.006)	0.009 (0.008)	0.011** (0.005)	0.011* (0.006)

CN Competitors: Innovation Improvement Led by SOEs

Outcome	No Control		With Control	
	Wild Bootstrap	Cluster	Wild Bootstrap	Cluster
Panel A: SOE sample				
Ln(patent+1)	0.138 (0.109)	0.138 (0.111)	0.268** (0.130)	0.268*** (0.090)
Ln(citation+1)	-0.094 (0.105)	-0.094 (0.130)	0.002 (0.139)	0.002 (0.176)
Patent/RDC	0.005 (0.005)	0.005 (0.006)	0.010 (0.007)	0.010** (0.004)
ROA	0.008** (0.003)	0.008* (0.004)	0.010** (0.005)	0.010** (0.004)
Panel B: non-SOE sample				
Ln(patent+1)	0.041 (0.056)	0.041 (0.053)	0.138** (0.064)	0.138** (0.059)
Ln(citation+1)	-0.006 (0.004)	-0.006** (0.003)	0.002 (0.004)	0.002 (0.004)
Patent/RDC	-0.006 (0.004)	-0.006** (0.003)	0.001 (0.004)	0.001 (0.003)
ROA	0.002 (0.003)	0.002 (0.002)	0.004 (0.003)	0.004* (0.002)

US Suppliers: Innovation and Financial Performance Decrease

Outcome	No Control		With Control	
	Wild Bootstrap	Cluster	Wild Bootstrap	Cluster
Patent_Count	-0.460*** (0.098)	-0.460*** (0.089)	-0.539** (0.224)	-0.539** (0.240)
Patent_Value	-0.423*** (0.118)	-0.423*** (0.105)	0.225 (0.493)	0.225 (0.551)
Patent_Cite	-0.682*** (0.119)	-0.682*** (0.128)	-2.270 (1.733)	-2.270 (1.914)
ROA	-0.018 (0.013)	-0.018** (0.009)	-0.024 (0.016)	-0.024* (0.014)

7 Discussion

While the sanctions target specific firms, their impact extends beyond the directly affected entities, influencing entire industries and creating ripple effects along supply chains.

4 Data Construction and Source

EL Firms

- (Chinese Sanctioned Firms)
- Download historical BIS Entity List versions.
- Match English names & addresses with Tianyancha, WIND & BvD to retrieve Chinese company names and ISINs.
- Total: 670 Chinese entities; 46 are A-share listed companies.

Upstream

Peer

Upstream

CN Suppliers

- (Chinese Suppliers to the EL Firms)
- Use CSMAR top-5 supplier & top-5 customer data.
- Identify 126 listed firms within ± 5 -year event window.

CN Competitors

- (Chinese Peers to the EL Firms)
- Use customs data to identify Entity List firms' imports from the US \rightarrow classify these as restricted goods
- Identify all firms importing those restricted goods from the US \rightarrow label them as competitors
- Identify 413 listed firms.

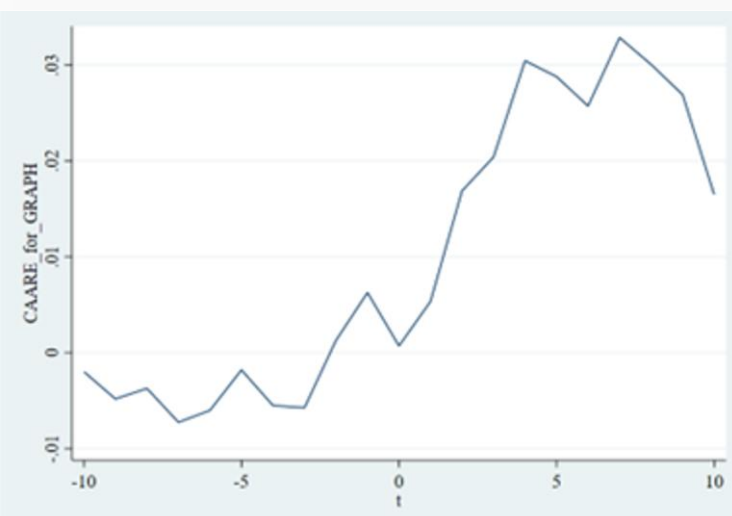
US Suppliers

- (US Suppliers to the EL Firms)
- Use FactSet Supply Chain Relationship dataset.
- Identify 160 listed firms within -5 -year event window.

Key Measurement

Ln(patent+1)	The logarithm number of inventions applied.
Ln(citation+1)	The logarithm number of citations received till 2024 (Han et al., 2024).
Patent/RDC	The patent number divided by R&D capital (Hirshleifer et al., 2012)
Patent_Value	Measuring patent market value using stock market data (Kogan et al., 2017)

5 Market Reaction



(a) FF3 Return of Chinese Suppliers



(b) FF3 Return of US Suppliers

CARs (-10 to $+10$; Est. -120 to -20):

- Boehmer et al. (1991) and Kolari & Pynnönen (2010).
- Chinese suppliers: $+3.48\%$. U.S. suppliers: -2.93% .

Announcement dates are manually collected from news reports.