

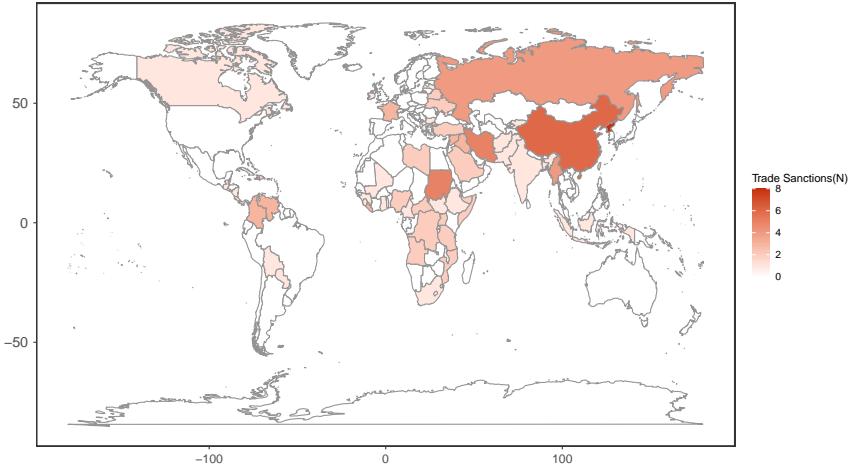
Sanction Busting or Industry Boosting? China's Strategic Response to US Sanctions

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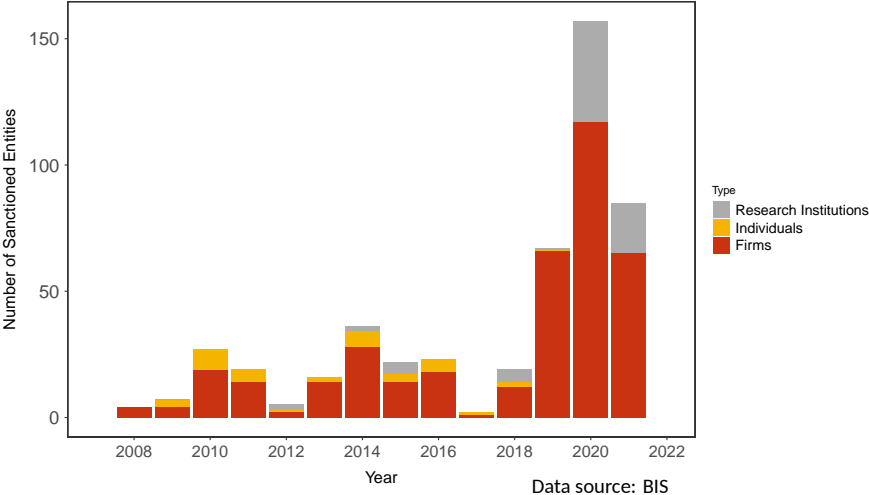
US Trade Sanctions against Other States



Data source: GSDB

China received the second-highest rounds of US trade sanctions, following North Korea.

US Sanctions Increasingly Target Chinese Firms



Research question: how does China respond to US rising sanctions on Chinese firms?

What Explains China's Response to US Sanctions?

1. Political Shielding

- SOEs or firms with political connections, hired revolving door politicians (Naughton and Tsai, 2015; Xu 2023, Li 2022).
- **Empirical prediction:** favors politically important firms.

2. Strategic competition

- Picking winners or building winners through industrial policies (Rodrik, 2004)
- Links to the literature of economic sanctions (Hufbauer et al., 1990; Drezner 2011) and the rise of China's economic statecraft (Stone, 2021, Pearson et al. 2022), increasing self-reliance amid weaponized interdependence (Farell and Newman, 2019).
- **Empirical prediction:** support sanctioned firms + other firms in the industry.

US Sanctions Drive China to Double Down on Industrial Policies

- This project examines China's response to US sanctions and their signaling effects on the market.
- Empirically, I collected novel firm-level data to show that
 - **Counteracting US sanctions:**
China's increased support to sanctioned industries through (1) subsidies, (2) government contracts, and (3) expedited patent applications.
 - **Signaling effects to market actors:**
China's protective measures provide assurance to market actors.
- US trade sanctions → heightened support from the Chinese Government → attract other market actors to follow suit

- Data and Empirical Strategy
- Strategic Competitions: Supporting Both Sanctioned Firms and Competitors
- Sanctioned Firms Gain Additional Leg up Through Subsidy

Challenge: Non-random Assignment of Sanctions

- **Challenge:** Identify firms that could potentially be affected by sanctions.
- **Proposed Solution:** (1) find sanctioned firms; (2) find sanctioned firms' major competitors in the Chinese market.

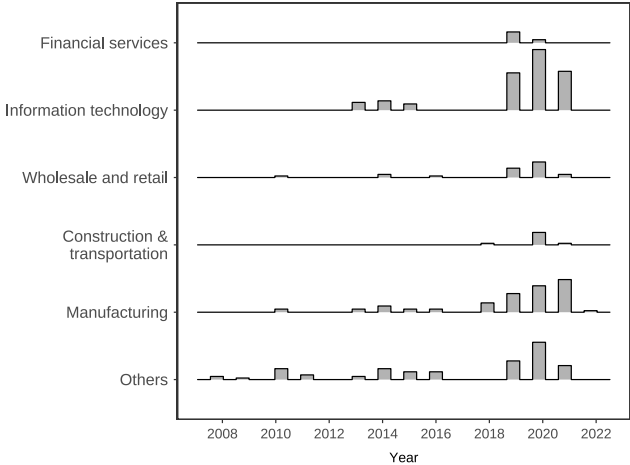
Step 1: Find Sanctioned Firms

- Sanctioned firms:
 - 270 Chinese firms sanctioned on the US Entity List until April 2022.



The screenshot shows the top navigation bar of the U.S. Department of Commerce website. It includes the department's logo, the text "U.S. Department of Commerce", a search bar with a "Search" button, and links for "Bureaus and offices" and "Contact us". Below the navigation bar are menu items: "ABOUT", "ISSUES", "NEWS", "DATA AND REPORTS", and "WORK WITH US". The main content area features a breadcrumb trail "Home > News > Press releases" and a list of links: "All news", "Press releases", "Blog", "Speeches", "Fact sheets", and "Op-eds". The primary headline is "Commerce Department Further Restricts Huawei Access to U.S. Technology and Adds Another 38 Affiliates to the Entity List".

Step 1: Who are the Sanctioned Firms?



Many sanctioned firms are large (35%) or mid-size firms (27.5%), in Beijing, Guangdong, Jiangsu, and Shanghai.

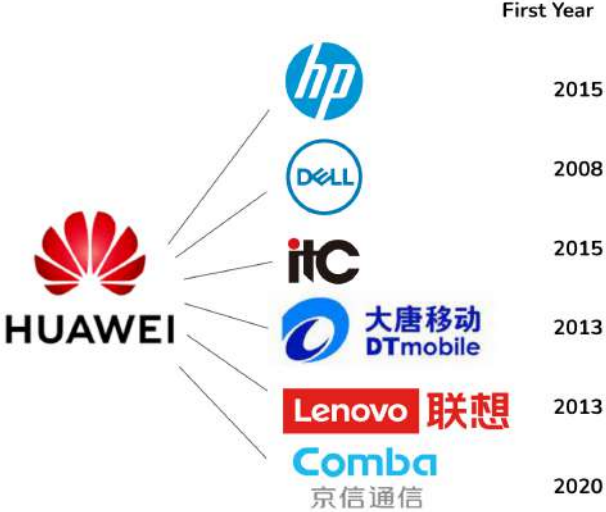
Step 2: Find Sanctioned Firms' Competitors



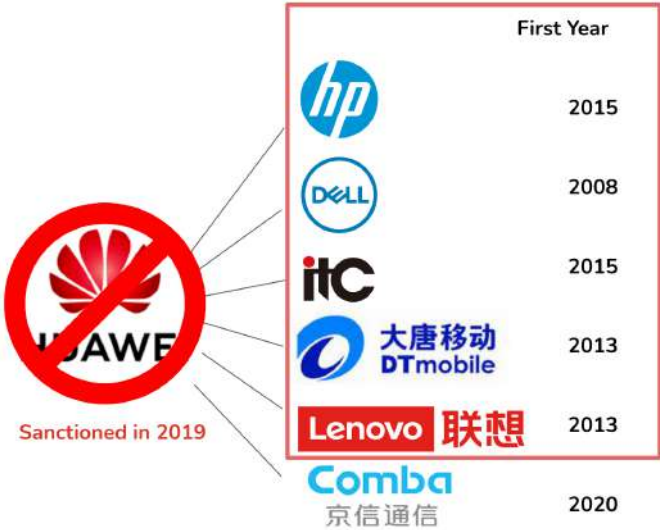
Step 2: Find Sanctioned Firms' Competitors



Step 2: Focus on Competitors before Sanctions



Step 2: Focus on Competitors before Sanctions



Step 2: Compare Treated and Not-yet Treated Firms



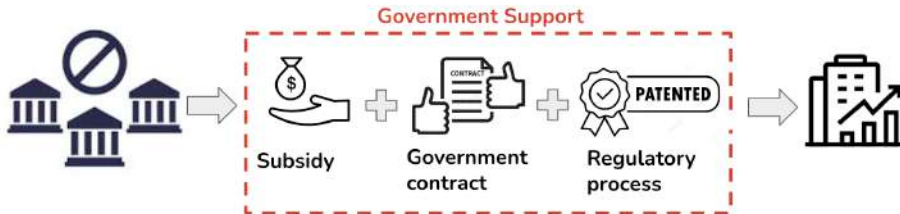
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Challenge: Non-random Assignment of Sanctions

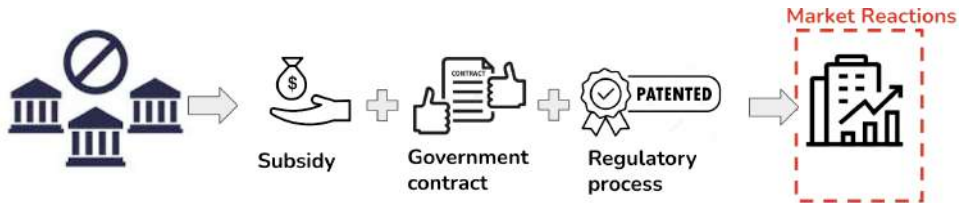
- **Challenge:** Identify firms that could potentially be affected by sanctions.
- **Proposed Solution:** (1) find sanctioned firms; (2) find sanctioned firms' major competitors in the Chinese market.
- Sanctioned firms:
 - 270 Chinese firms sanctioned on the US Entity List until April 2022.
- Competitors:
 - 4655 competitors including SOE, private firms, joint ventures, and foreign firms.
 - Based on four criteria: bid same contracts; specialized certificates; lawsuits; highly similar products.

Measuring Government Support and Market Reactions



- Government subsidy:
 - Collected over 39,700 itemized government subsidies from 2008 to 2022.
- Government contract:
 - Scraped over 660,000 government contracts from 2008 to 2023.
- Expedited regulatory process
 - Obtained over 980,000 patents (type, process time, approval status).
- Market reactions: expanding business
 - Scraped ~ 1,384,000 commercial contracts from 2008 to 2023.

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Empirical Strategy

DiD with Staggered Adoption Design (Callaway and Sant'Anna, 2021)

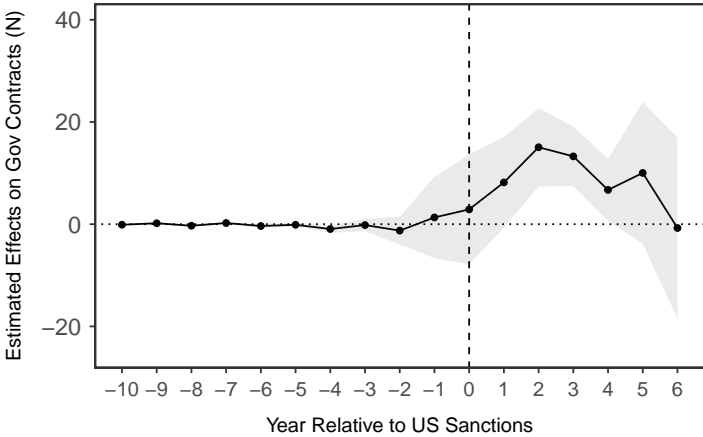
- **Identification assumption:** conditional parallel trends
 - Firms affected by US sanctions and firms not yet affected follow the same trends.
 - No never-treated firms in the data.
- **Estimate with doubly robust estimator:**
 - Combining the outcome regression and the inverse-probability weighting
- Include firm-level controls: ownership, size, industry, locations, registered capitals.
- Check for pre-trends and dynamic effects over time.

DR estimator

Treatment history plot

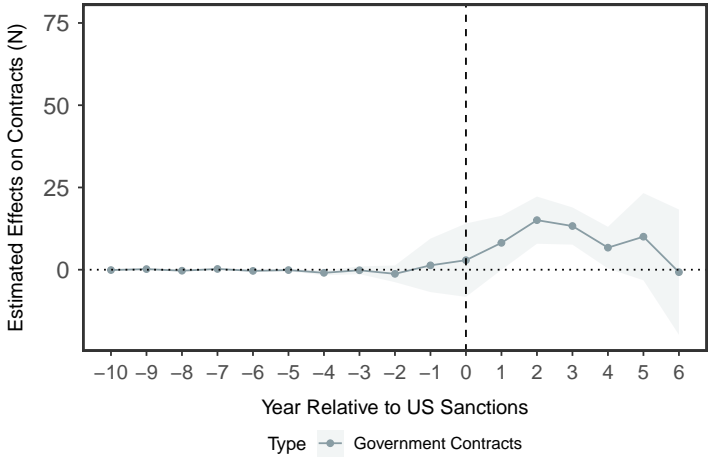
- Data and Empirical Strategy
- **Strategic Competitions: Supporting Both Sanctioned Firms and Competitors**
- Sanctioned Firms Gain Additional Leg up Through Subsidy

Sanctioned Firms and Competitors Received More Government Contracts



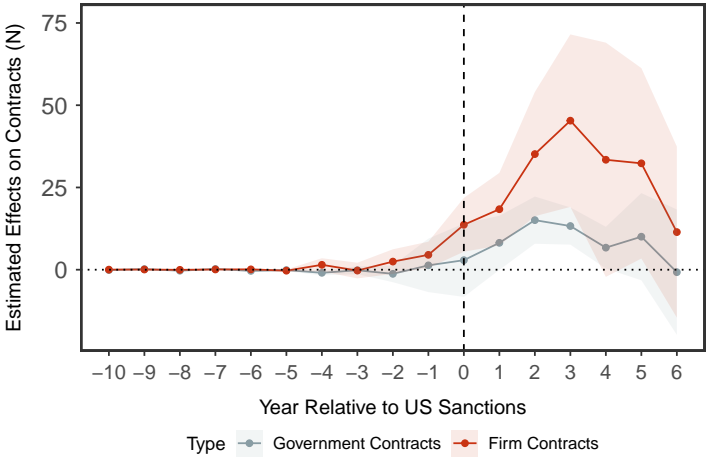
Takeaway: Within the next 2 years of US sanctions, the Chinese Government provides ~ 14.2 more contracts to both sanctioned firms and their competitors .

Also Gained More Commercial Contracts



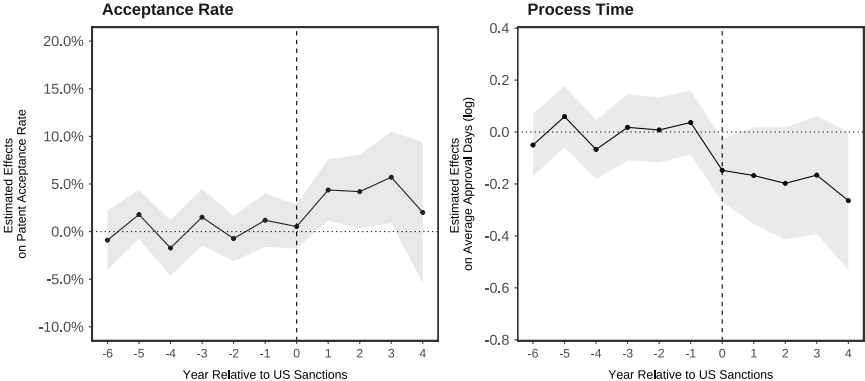
Takeaway: The Chinese government's support sends a strong signal to the market and encourages other firms to sign new contracts with sanctioned firms and their competitors.

Also Gained More Commercial Contracts



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Higher Patent Approval Rate with Faster Process

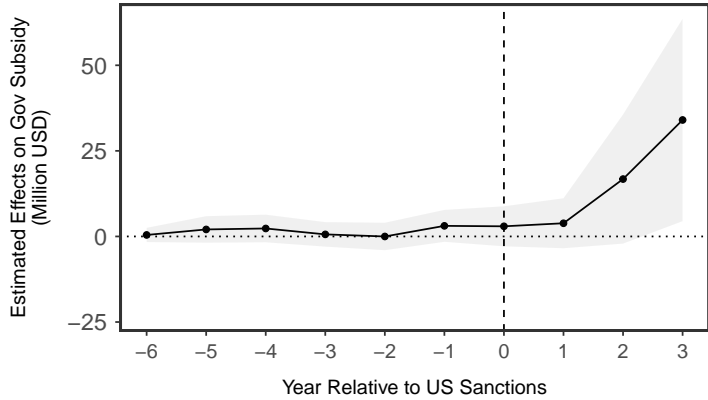


Takeaway: Sanction firms and their competitors' patent applications have better approval rates and are fast-tracked (application time reduced by ~ 20% on average).

Utility patent

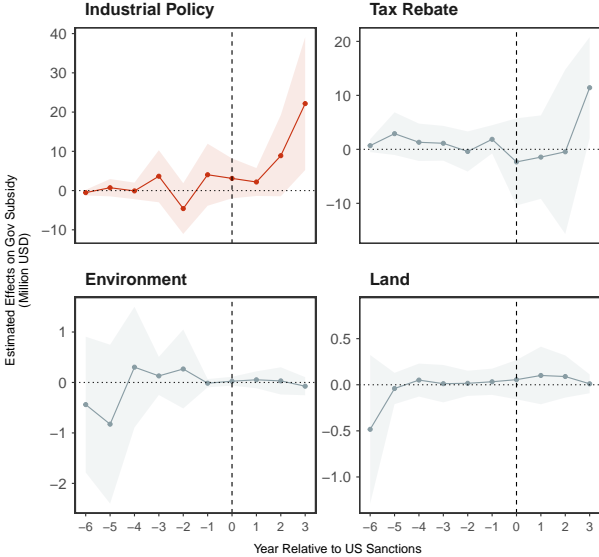
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Sanction Firms Received More Subsidies

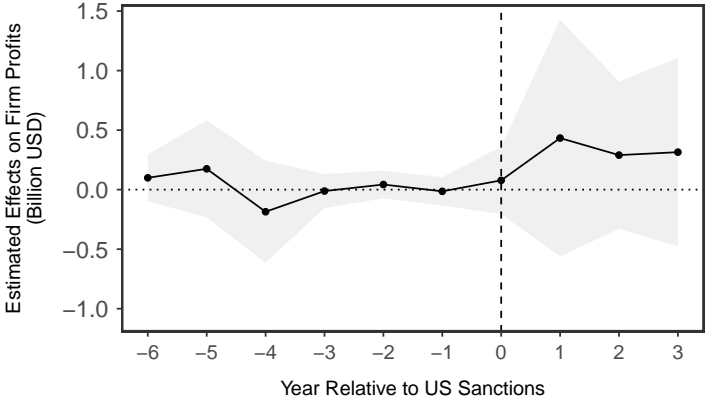


Takeaway: Among listed firms, the Chinese Government has provided ~ 14.4M USD to each sanctioned firm, in the next 3 years following US sanctions.

Primarily Channeled through Industrial Policies



Sanctioned Firms Aren't Experiencing Profit Losses



Takeaway: By far, US sanctions have imposed limited economic costs on sanctioned firms' annual profits.

Summary

- Counteracting US sanctions
 - More **government contracts** (~ 14.2) and expedited **patent** applications (time reduced by 20%).
 - Additionally, sanctioned firms received 14.4M USD more **subsidies** through industrial policy programs.
- Signaling effects to market actors
 - China's protective measures provide assurance to market actors
 - Market actors have followed suit and signed more commercial contracts.
- Implications
 - The impact of geopolitics on domestic industrial policymaking.
 - The target state's countermeasures limit sanction effectiveness.

Appendix

Background

China's state-fund

Made-in-China 2025

Sanction reasons

Research Design

Treatment history

Propensity score

Contracts, subsidy and patent

Heterogenous effects by industry

Different types of contracts

Only include competitors

SOE vs Private

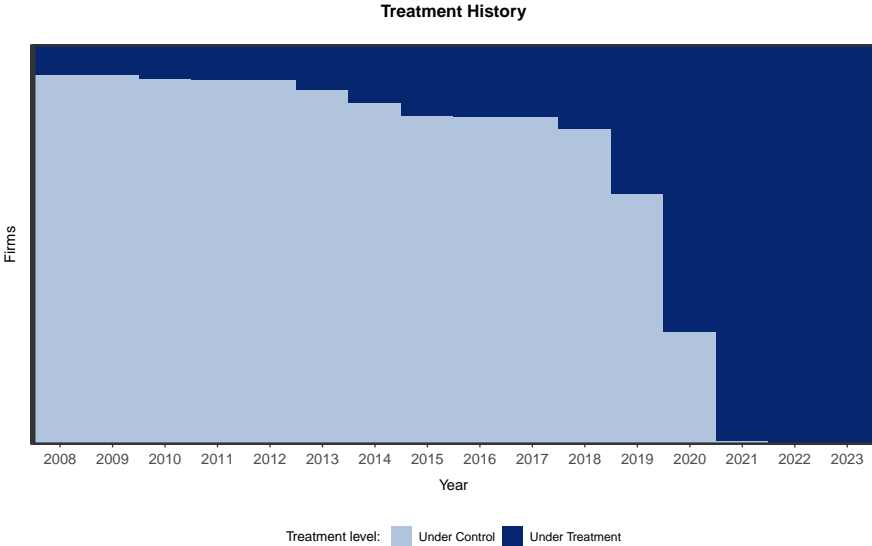
Utility patent

Patent applications

Market response

New Market Entrants

Treatment History Plot



Doubly Robust Estimator

Doubly robust estimator

$$\widehat{ATT}_{dr}^{ny}(g, t) = \mathbb{E}_n \left[\left(\widehat{W}_g^{\text{treat}} - \widehat{W}_g^{\text{comp},ny} \right) \left(Y_t - Y_{g-1} - \widehat{m}_{g,t}^{ny} \left(X; \widehat{\beta}_{g,t}^{ny} \right) \right) \right]$$

where

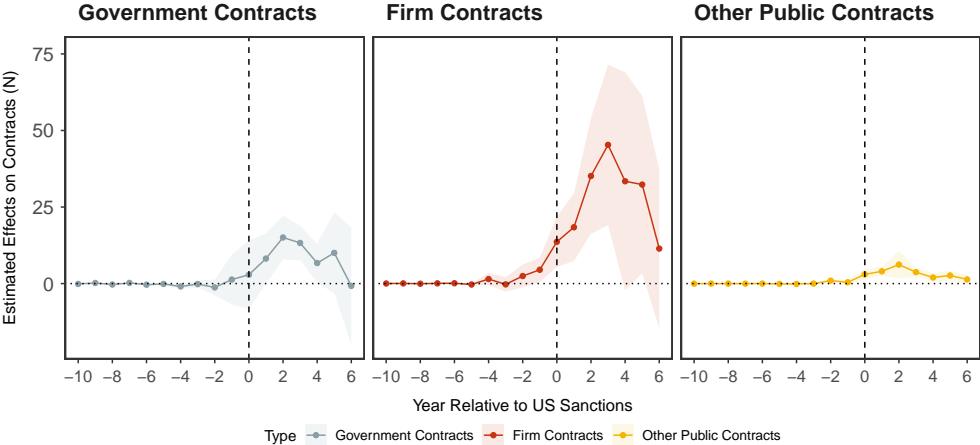
$$\widehat{W}_g^{\text{treat}} = \frac{G_g}{\mathbb{E}_n [G_g]}, \quad \widehat{W}_g^{\text{comp},ny} = \frac{\frac{\widehat{p}_{g,t}(X; \widehat{\pi}_{g,t})(1-D_t)(1-G_g)}{1-\widehat{p}_{g,t}(X; \widehat{\pi}_{g,t})}}{\mathbb{E}_n \left[\frac{\widehat{p}_{g,t}(X; \widehat{\pi}_{g,t})(1-D_t)(1-G_g)}{1-\widehat{p}_{g,t}(X; \widehat{\pi}_{g,t})} \right]}$$

- Y is the total number of contracts firms received in year t
- D represents the treatment status
- G is the group indicator (the year a firm was sanctioned)

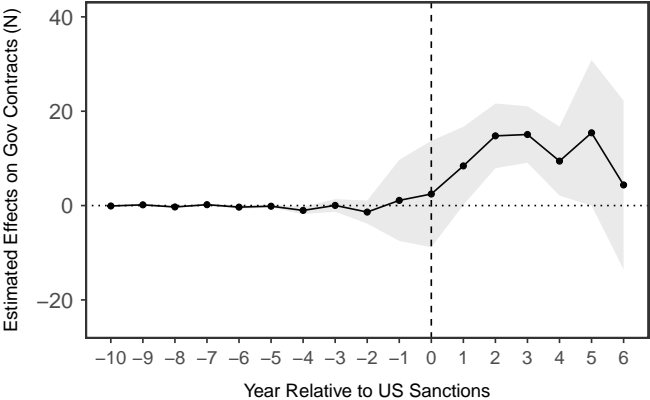
► Empirical Strategy

Appendix

Different types of contracts received

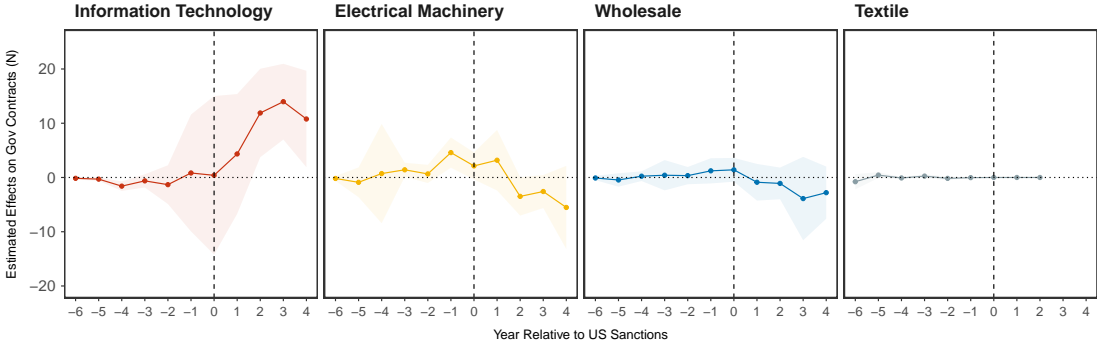


Sanction effects on government contracts (among competitors)



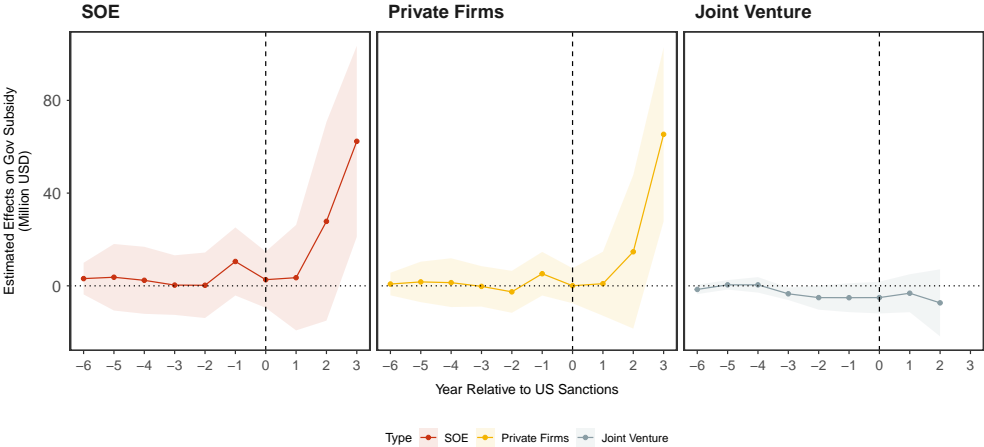
Takeaway: The main effects on government contracts are robust to exclude sanctioned firms and only include their competitors.

Information technology firms get more government contracts



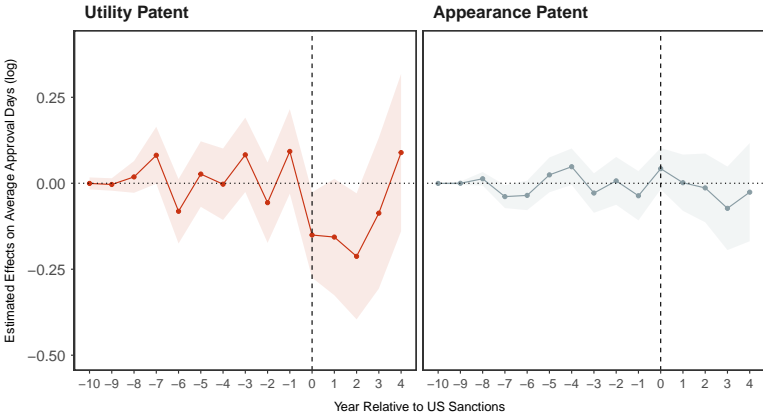
Takeaway: Firms from information technology industries get more government contracts.

Prioritize SOE and private firms through subsidy



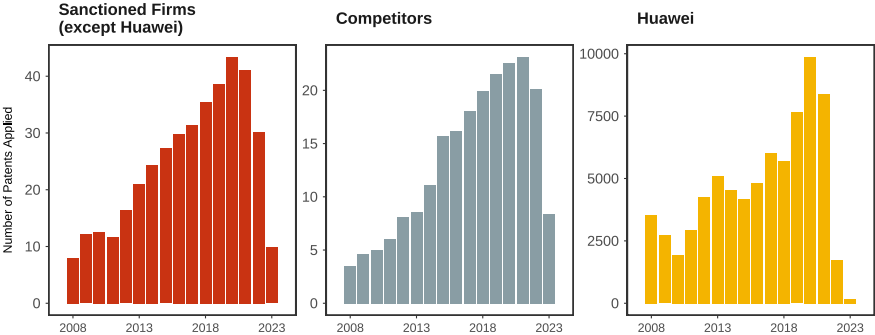
Takeaway: SOE and private firms received more Chinese government subsidies after being sanctioned by the US, but not joint-venture firms. [Appendix](#)

Expedited Patent Application Processing Time



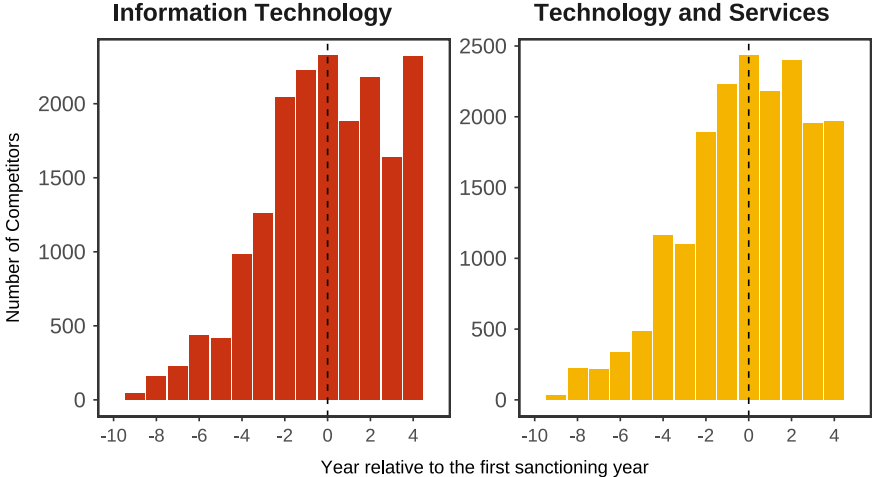
Takeaway: Sanctioned firms and their competitors' utility patent applications get quick turnaround, compared to the less innovative applications like appearance patents.

Growing patent applications over the Years

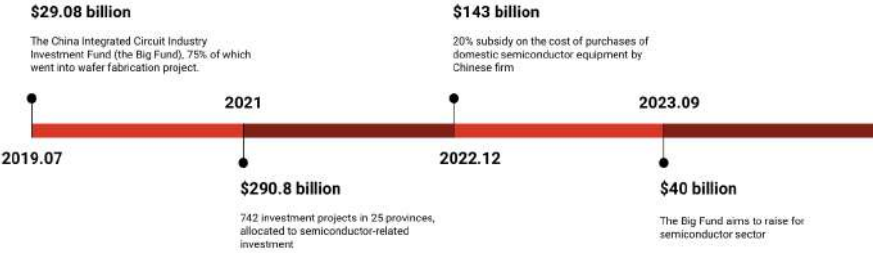


Takeaway: Both sanctioned firms and their competitors have continued to file for more patents over time, even for firms with substantial existing patent portfolios like Huawei.

More competitors enter into the industry



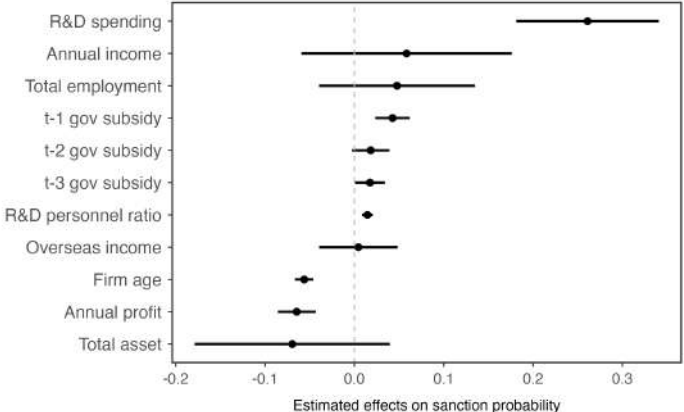
China's increasing investment in high-tech industries



As the Chinese economy grows, breaking through *the bottleneck of critical core technologies* is a pressing matter. We must adhere to a problem-oriented approach, leverage the advantages of our institutions to *mobilize and concentrate nationwide effort and resources* and work hard to catch up and achieve technological self-reliance.

- President Xi, 06.28.2022

New and high-tech firms more likely to face sanctions



R&D spending, R&D personnel ratio, last year subsidy, annual profit, and firm's age have significant effects on sanctioned probability.

China's strategic sectors

Made in China 2025: Target Sectors



Graphic©Asia Briefing Ltd.

Context: US sanctions against China

- Preventing human rights violations
- Technology competitions
- Sovereignty disputes in the South China Sea
- Illicit weaponry exports
- Iran and Korea related



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DATA AND REPORTS ▾ WORK WITH US ▾

Home » News » Press releases

Department of Commerce Announces the Addition of Huawei Technologies Co. Ltd. to the Entity List

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