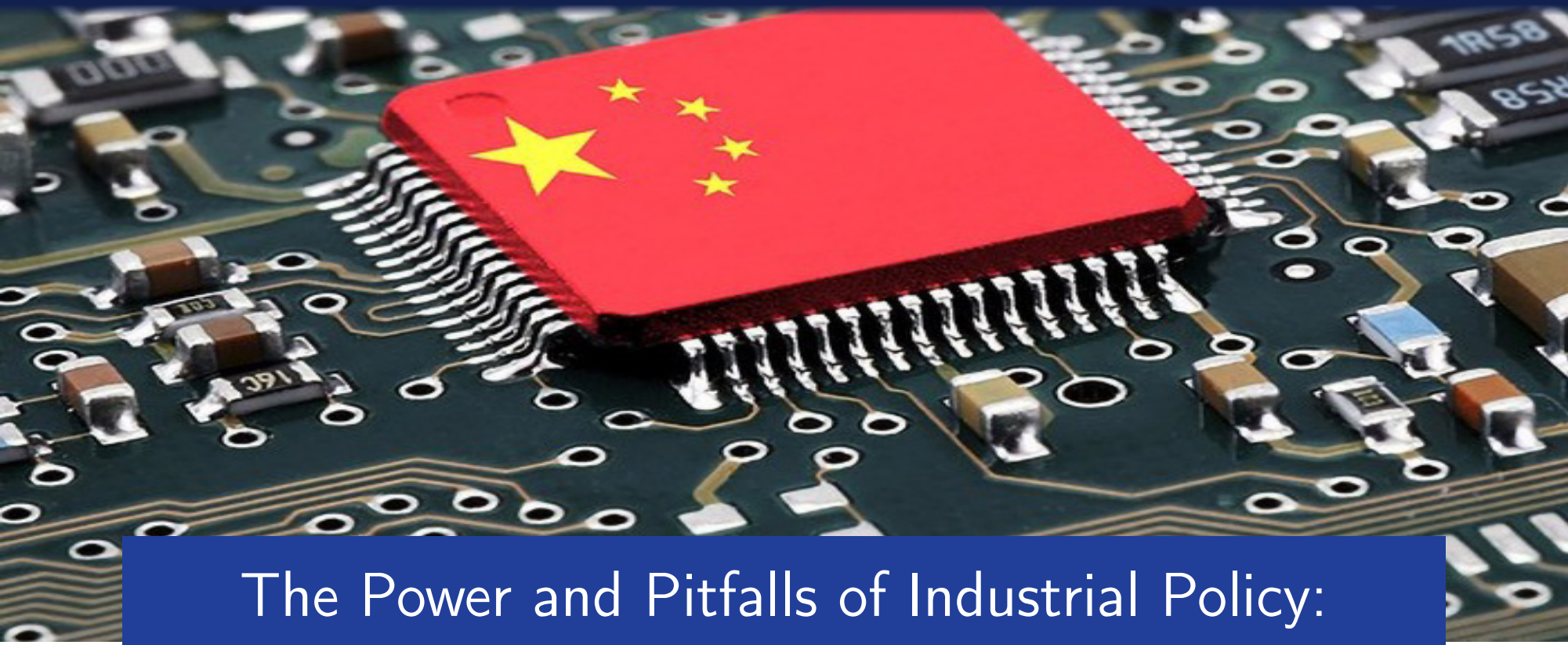

The Power and Pitfalls of Industrial Policy:

Evidence from China

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August 14, 2026

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2 The SEI Characteristics

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China's economy at a turning point

- **1980s–2000s**: Rapid industrialisation and global integration
  - World's largest manufacturer by 2010
- **Post-2000s**: Headwinds mount
  - Population aging, pollution, decoupling from the West
- **Strategy pivot**
  - Factory floor → innovation engine
  - Open markets → self-reliance
- **Core lever: the resurgence of industrial policy**
  - **The Strategic and Emerging Industries** (SEI) Initiative in the 2010s

Strategic pivot: The 2010 SEI Launch

The Strategic Emerging Industries Development Plan (SEI)

- Flagship drive across two Five-Year Plans (2010-2020)
- Central government defined 7 sectors: *Biotechnology, New energy, New materials, Electric Vehicle, Energy Conservation, Next-gen IT, and High-End Manufacturing*
- Local governments are encouraged to diversify
  - Inner Mongolia $\rightarrow$ wind power
  - Guangzhou $\rightarrow$ electric vehicle
- Classic industrial policy tools: subsidies, tax breaks, credit access, land provision

This Paper: Evaluating China's SEI Initiative

Three questions

- Does the SEI boost innovation in the targeted sectors?
- What happens to non-targeted sectors?
- Does local comparative advantage amplify the effects?

Approach

- Patents + policy documents + event study (Callaway and Sant'Anna, 2020)

Takeaway: SEI works – but not without trade-offs

- Innovation quantity doubles; quality stagnates
- Non-targeted sectors contract by 14% – evidence of crowd-out
- Effects strongest where pre-existing innovation strengths exist

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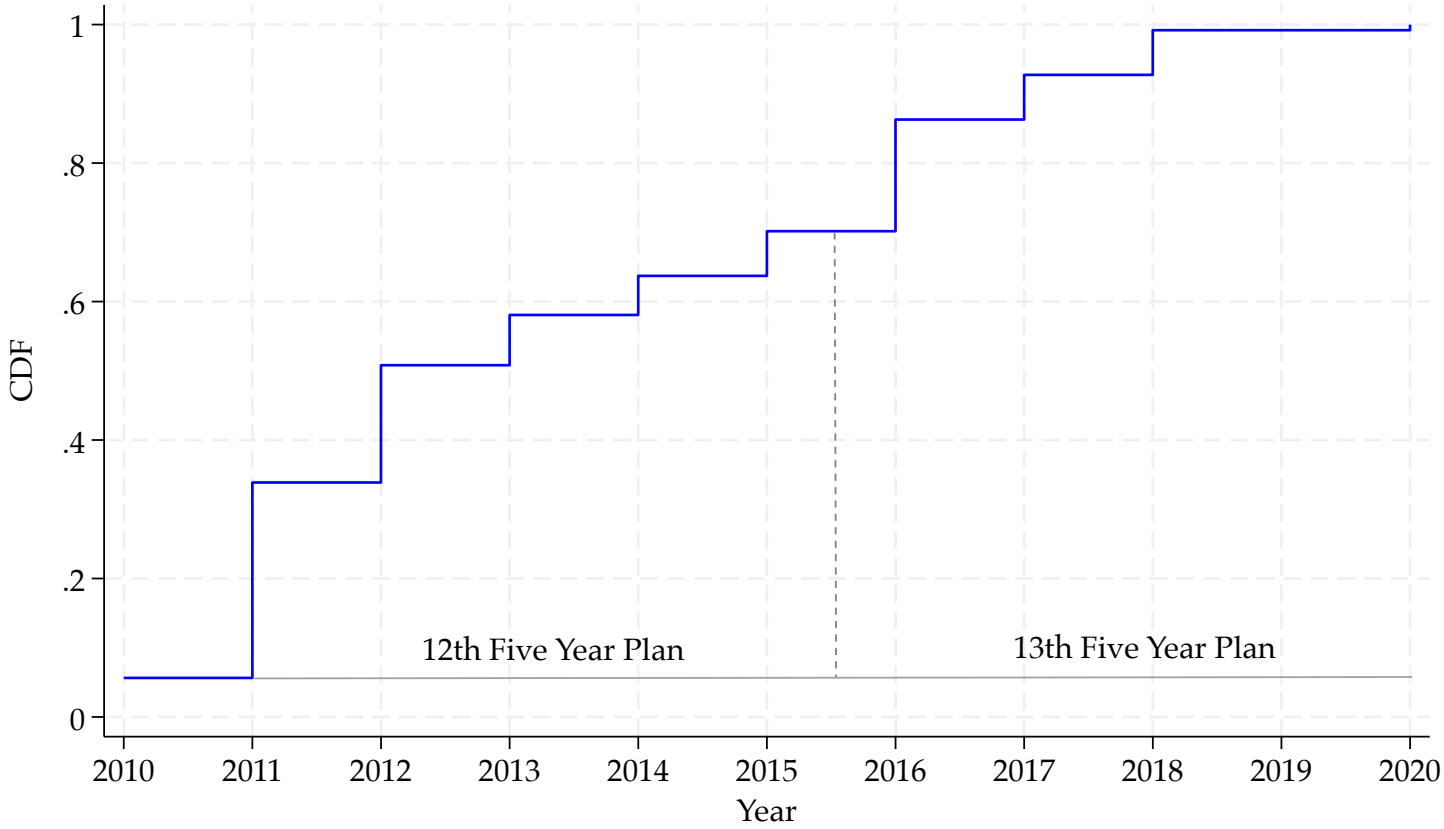
SEI rollout staggered across two Five-Year Plans

- Adoption spikes in 2011 and 2016, right after each National Five Year Plan

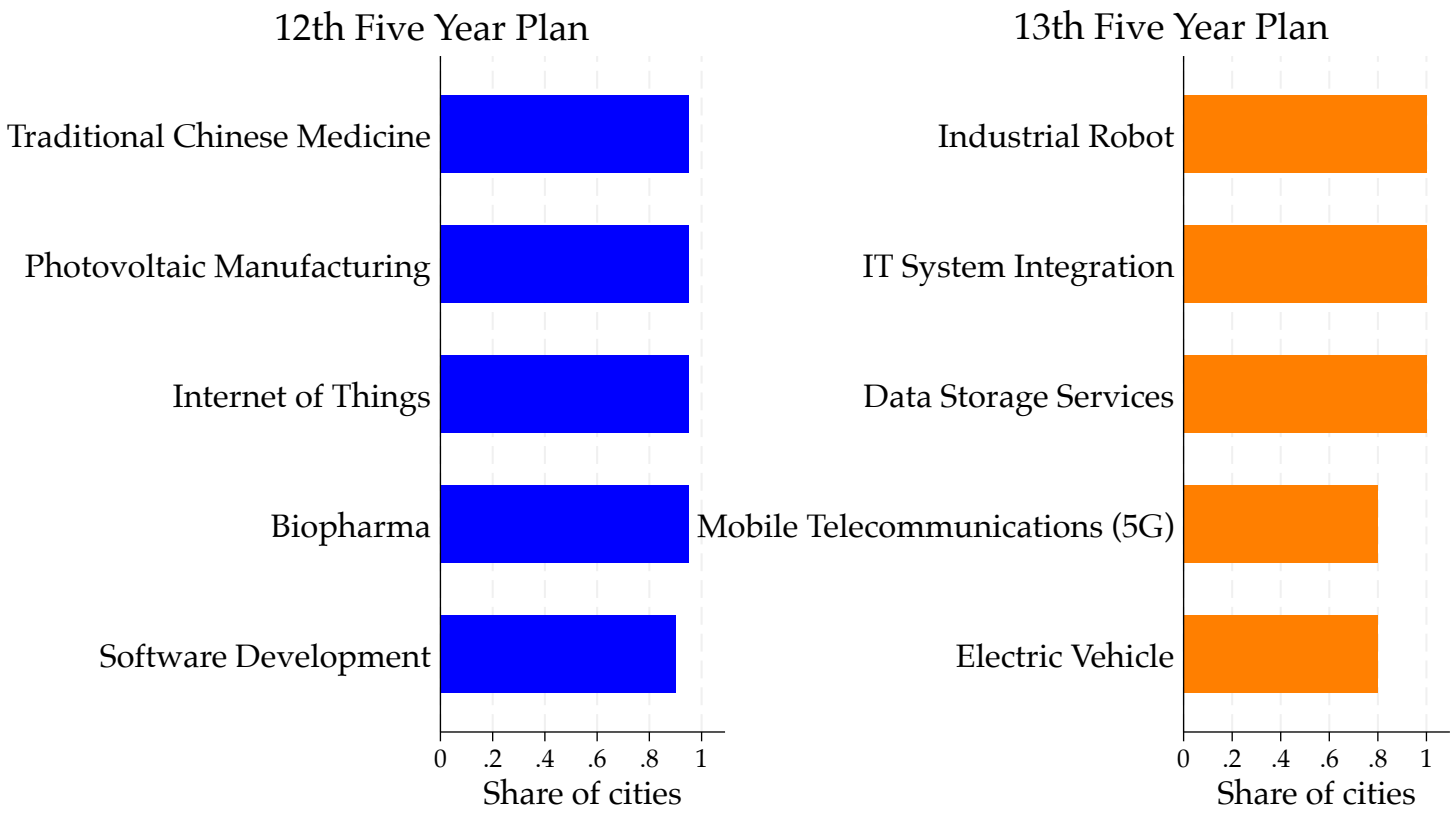
Fig. 1: Staggered SEI Rollout Across 123 Chinese Cities



National priorities set the tone

- Local governments align with nationally designated priority sectors

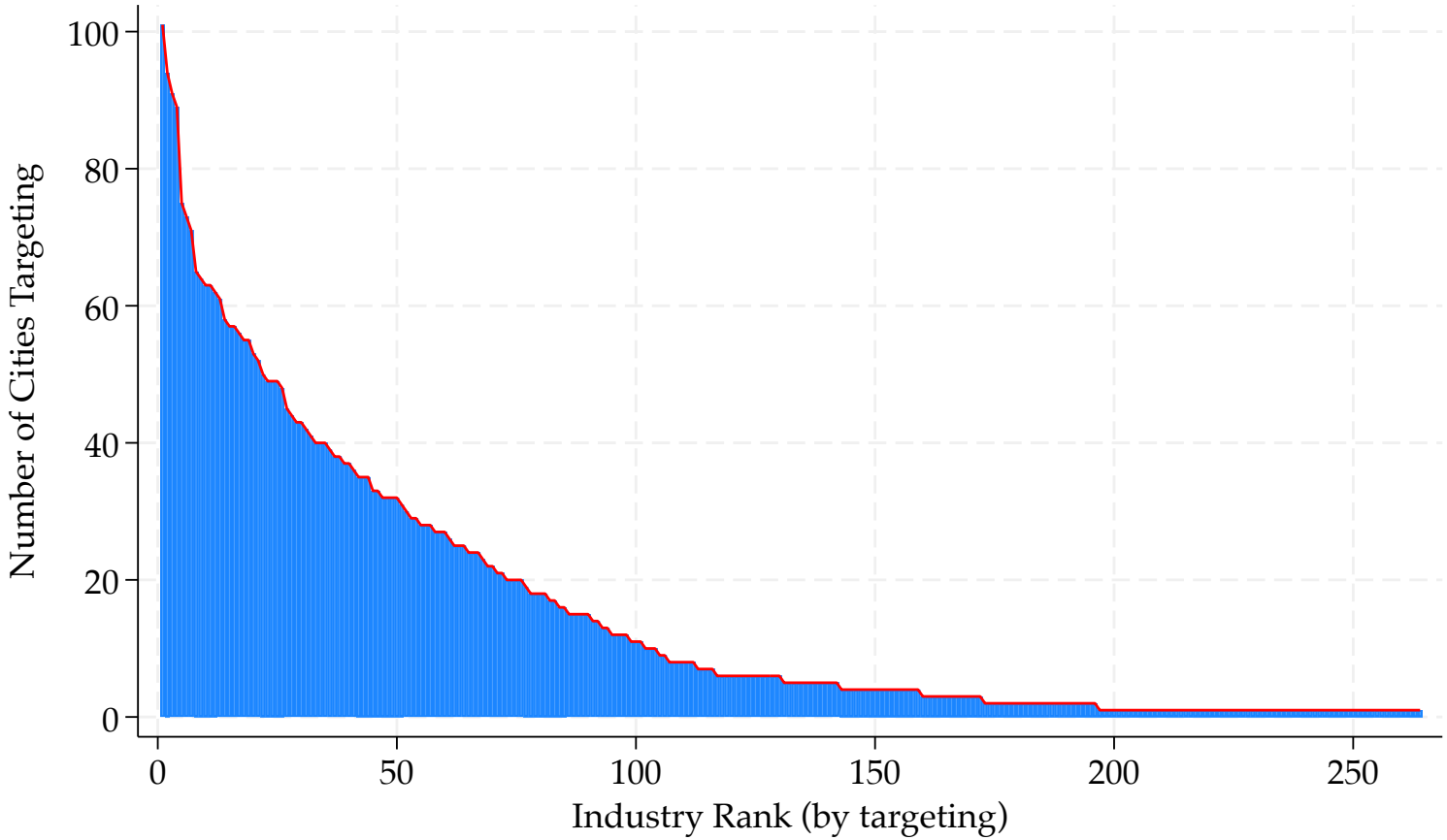
Fig. 2: Top SEI-Targeted Sectors



Local adaptation encouraged, but concentration persists

- Top 10% of industries absorb 40% of all local targeting

Fig. 3: Top SEI-Targeted Sectors



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SEI data: from policy texts to city-industry treatments

Novel dataset linking city-level SEI policy texts to disaggregated sectoral targets

- **Source**: PKU Law Database – 1,456 municipal SEI documents (2009–2024)
- **Treatment definition**: first year a city issues formal SEI plans with specified target sectors and at least one concrete policy instrument
- **Harmonisation**: raw sectors mapped to 4-digit national industrial classification
- **Scope**: 4,086 city-industry treatments, 123 cities, 264 targeted 4-digit sectors (2010–2018)

Patent data as a proxy for innovation

- **Source**: IncoPat (built on CNIPA data)
  - IPC codes harmonized to 4-digit national industry classification – links to SEI treatment data
- **Raw data**: 4.64 million invention patent records (applicant type, city, industry, year, citations, lifespan, and more)
- **Innovation quantity**: number of granted invention patent applications
- **Innovation quality**: citations (Hall et al., 2005), lifespan, overseas filings (Boeing and Mueller, 2016)
- **Industry-University-Research collaboration**: firm–firm, firm–university, firm–government partnerships

Event Study Design

Baseline: Staggered DiD (Callaway and Sant'Anna, 2020)

- Treated vs. control, before vs. after
- City-industry and year fixed effects

Propensity Score Model (PSM)

- Mitigates selection bias due to non-random treatment
- Covariates: GDP per capita, fiscal and science expenditures, imports and exports, sourced from City Statistical Yearbook and customs data

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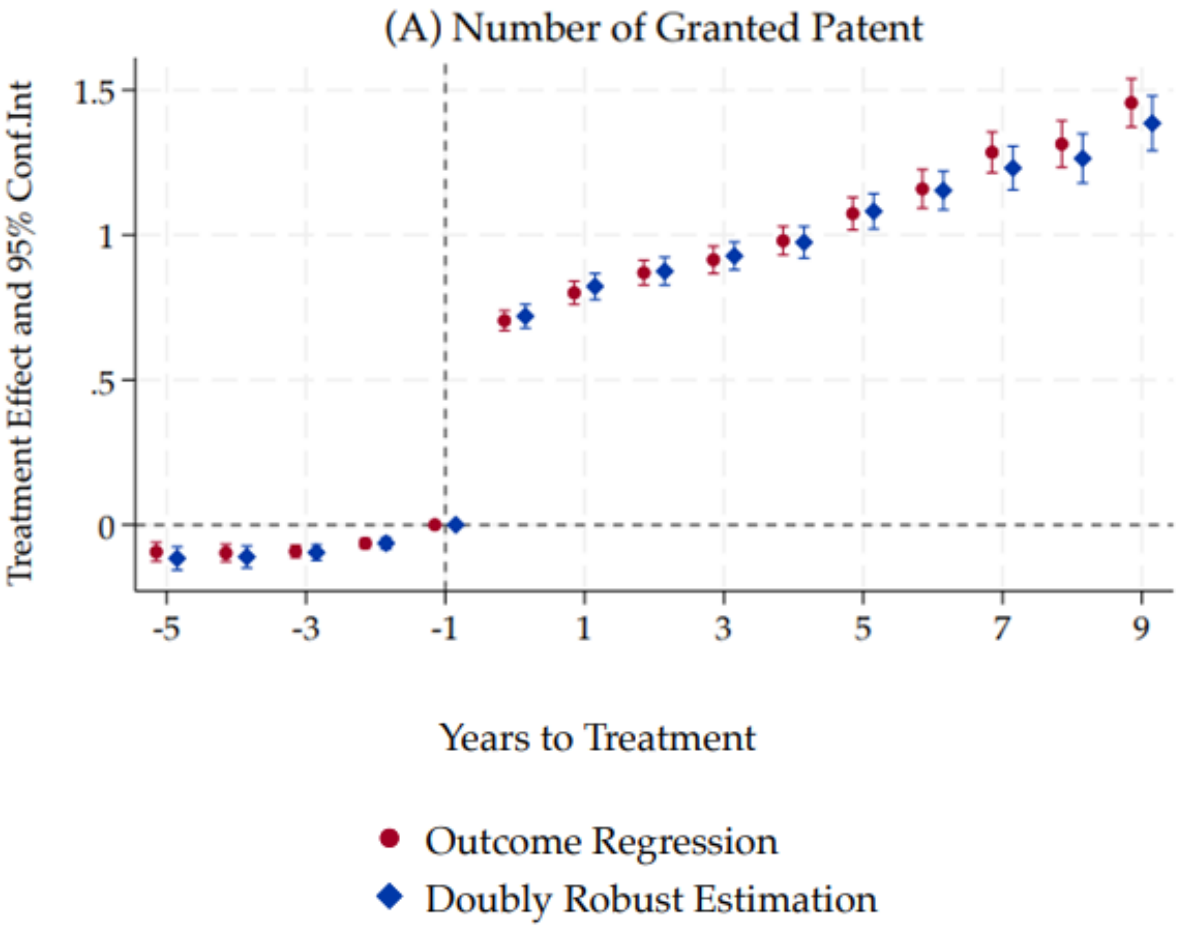
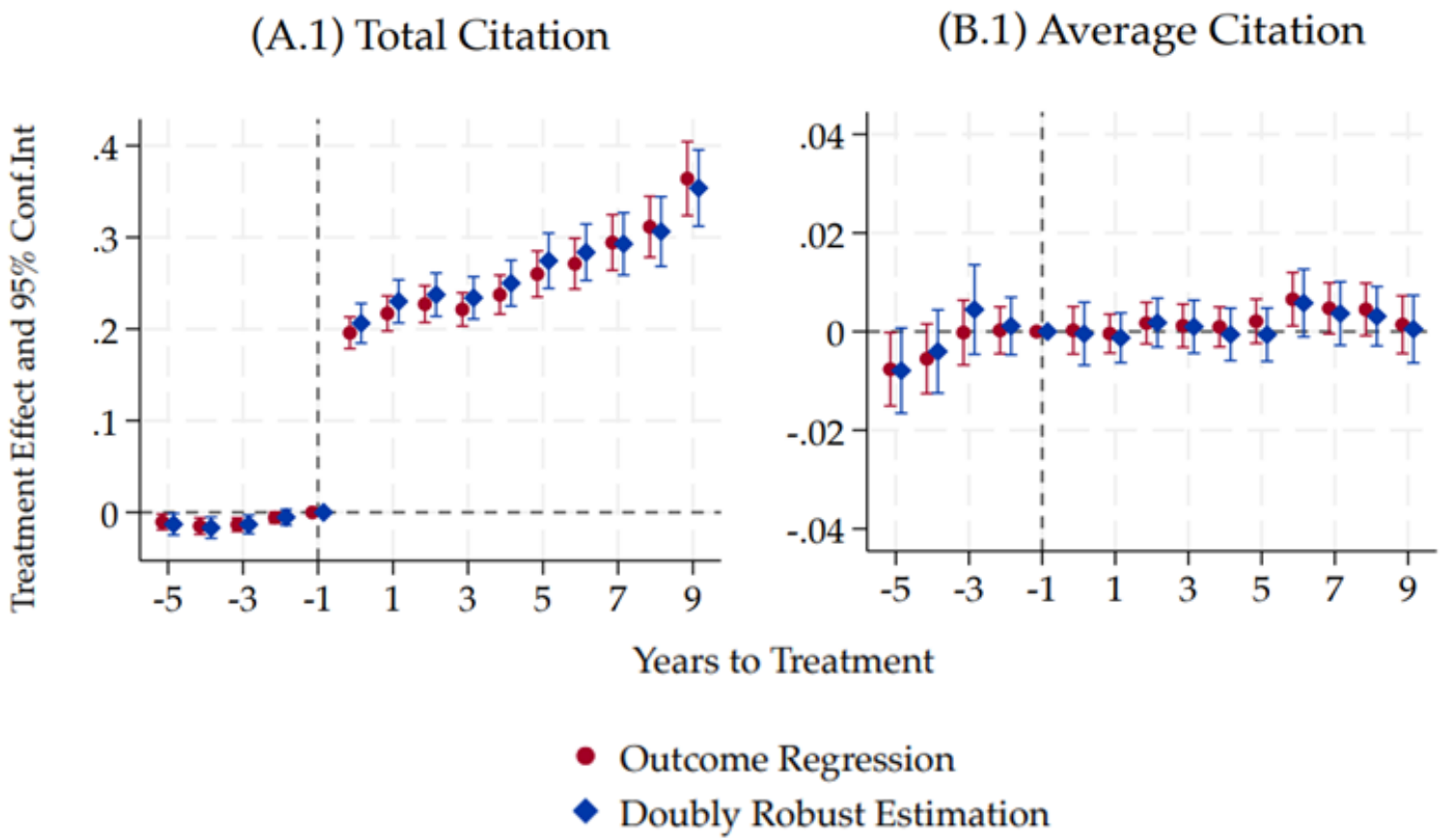
SEI had strong impacts on innovation quantity

Fig. 4: Event study estimates of SEI on innovation quantity – patent number



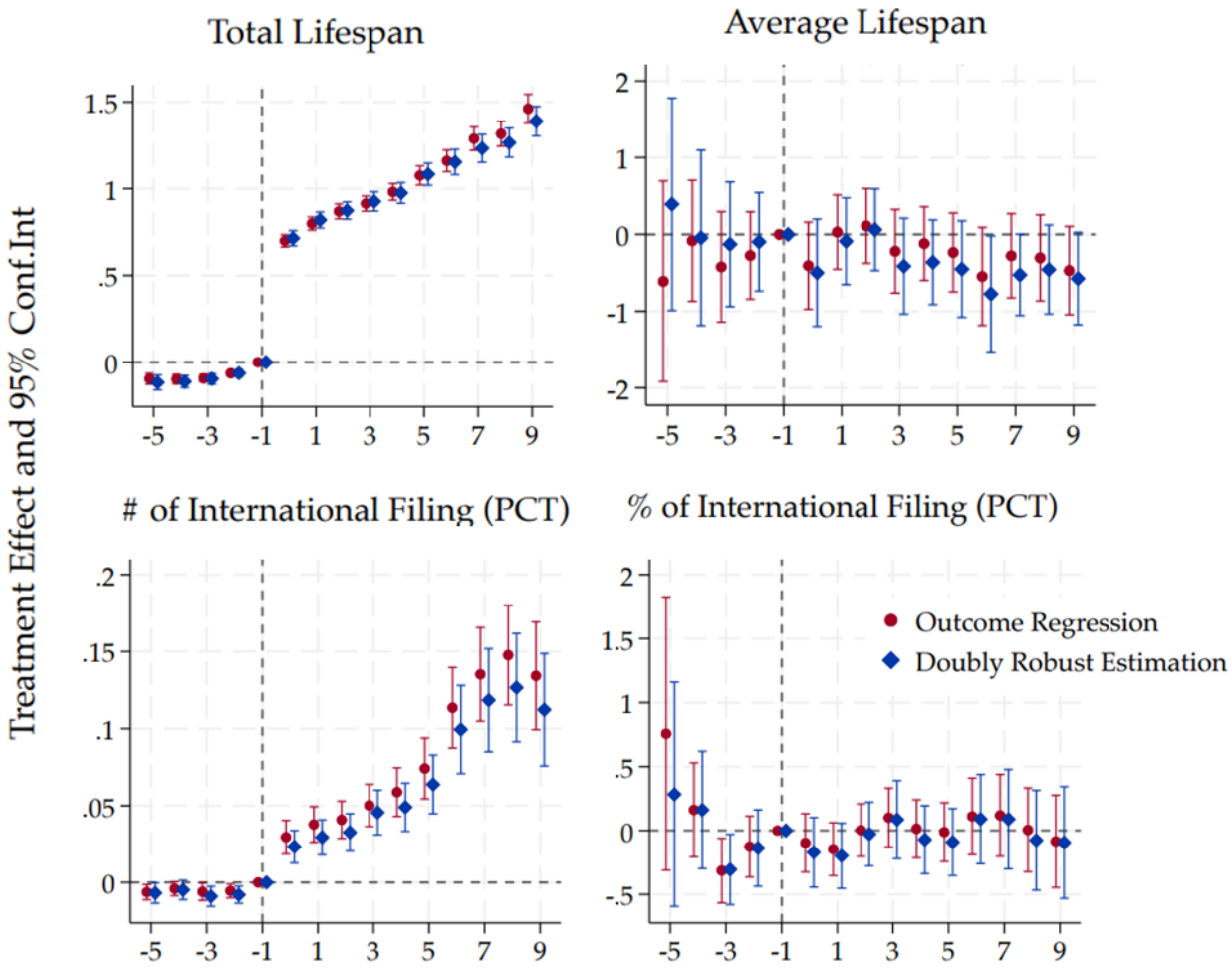
SEI boosts total citations, but not average citations

Fig. 5: Event study estimates of SEI on innovation quality – patent citations



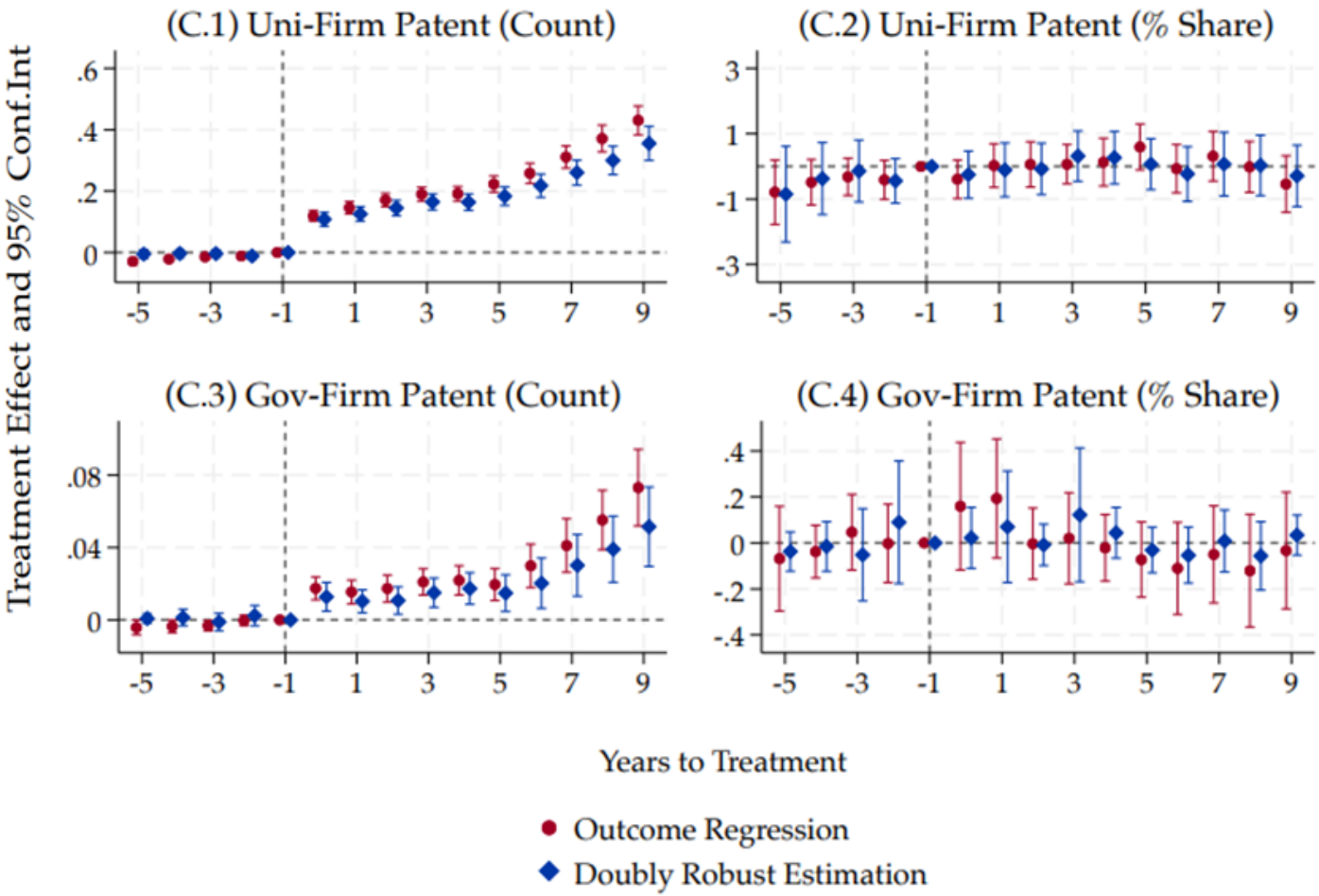
Patent lifespan and overseas filings rise – but also driven by scale

Fig. 6: Event study estimates: patent lifespan and overseas filings



A similar story for industry-university-research partnerships

Fig. 7: Event study estimates: firm, university and governments patent collaboration

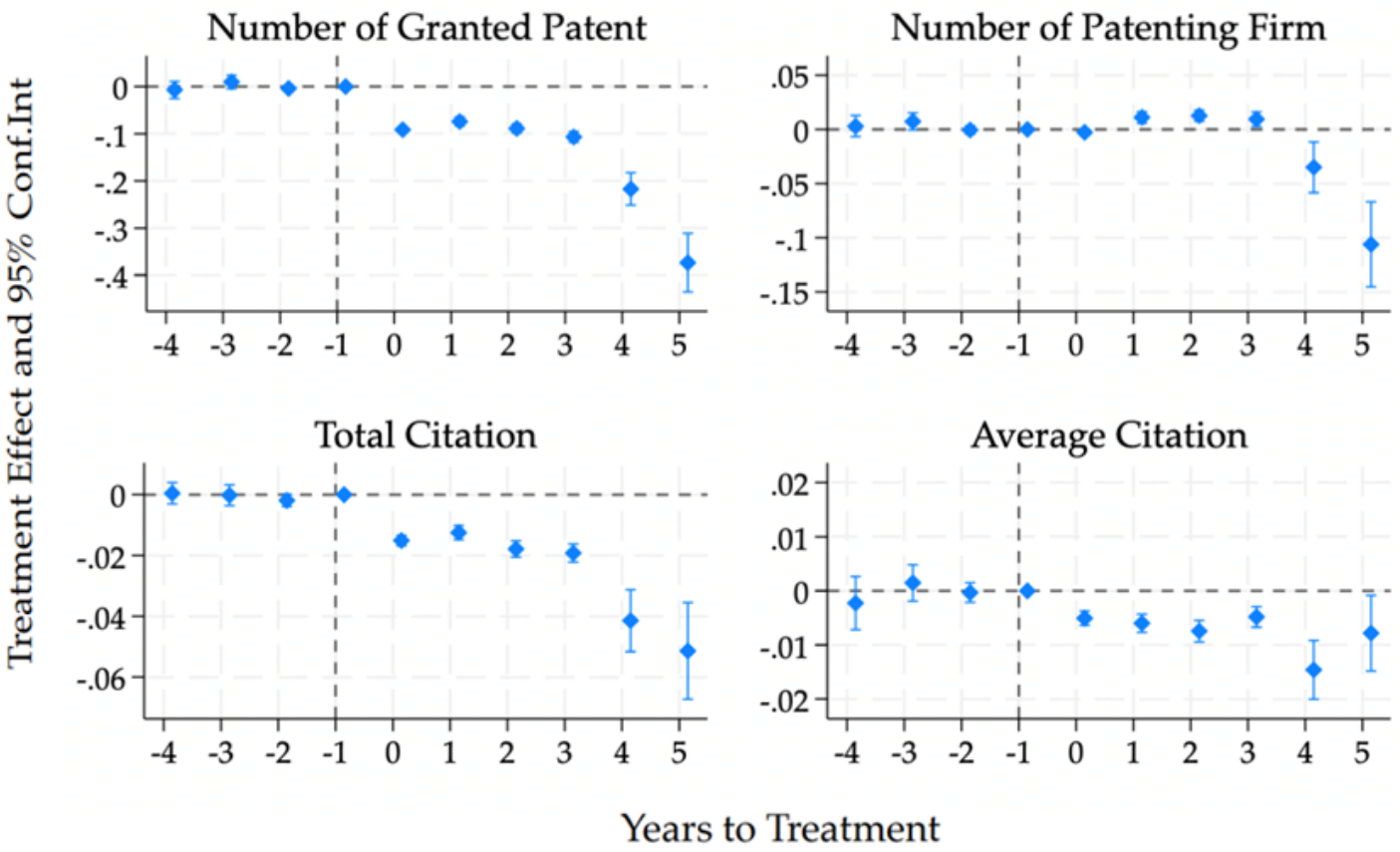


Innovation crowding-out in non-targeted industries

- Sample restricted to **never-treated sectors**
- Compare two groups:
  - 'Treated': never-treated sectors in SEI-adopting cities
  - 'Control': never-treated sectors in non-adopting cities
- Estimates whether SEI disadvantages non-priority sectors in SEI-adopting cities
  - Key findings: Untargeted sectors shrink, but the decline does not offset targeted sector growth

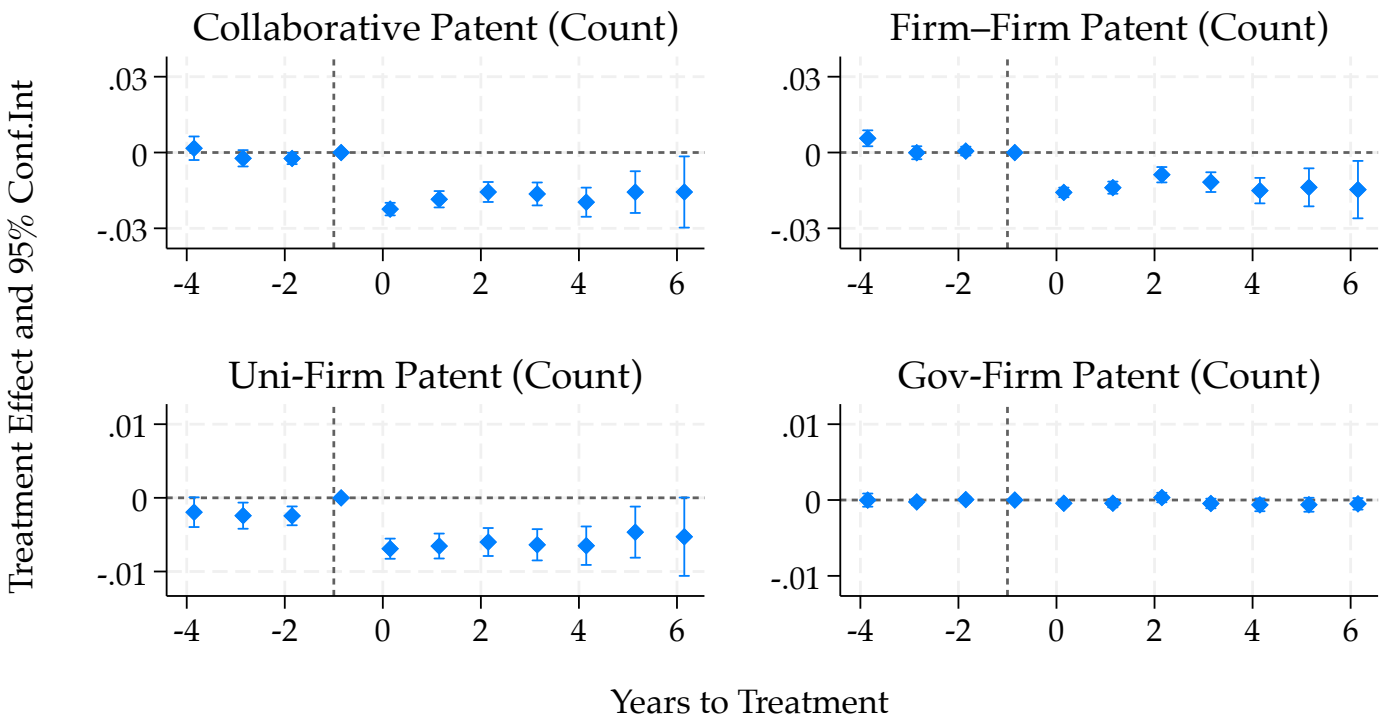
Innovation crowding-out in non-targeted industries: selected patent quantity and quality indicators

Fig. 8: Event study estimates: SEI's impact on never-treated sectors



Innovation crowding-out in non-targeted industries: patent collaboration

Fig. 9: Event study estimates: SEI's impact on never-treated sectors



Moving beyond the average policy effects

Are industrial policies equally effective everywhere?

- Previously we saw: cities converged on targeted sectors
- Hypothesis: policy success may depend on pre-existing city strengths
  - **RCA**: Measures **revealed comparative advantage** in innovation before SEI rollout (Balassa, 1965)

$$\text{RCA}_{city,industry} = \left(\frac{X_{city,industry}}{X_{city}}\right) / \left(\frac{X_{country,industry}}{X_{country}}\right)$$

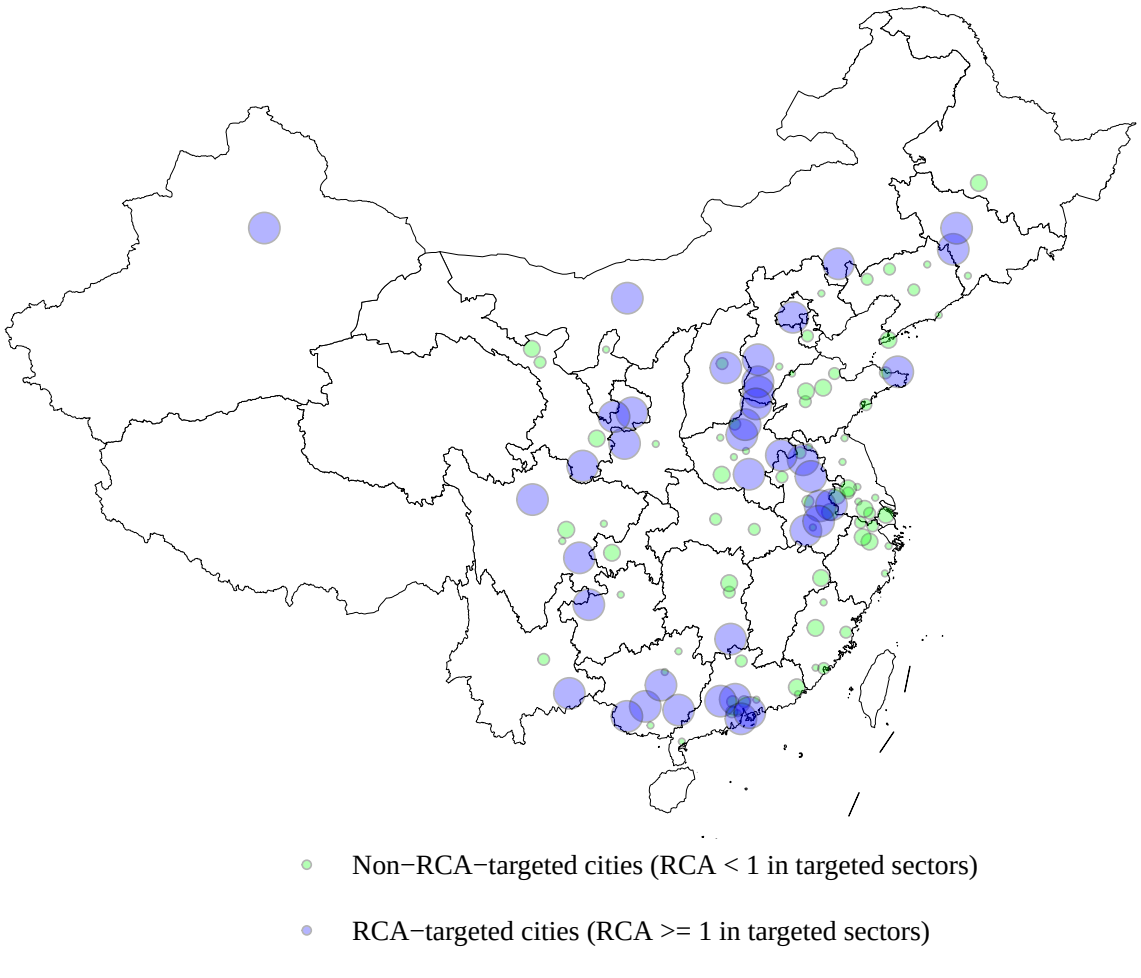
, where X is applied invention patent

$\text{RCA} \geq 1 \rightarrow$ comparative advantage

$\text{RCA} < 1 \rightarrow$ no comparative advantage

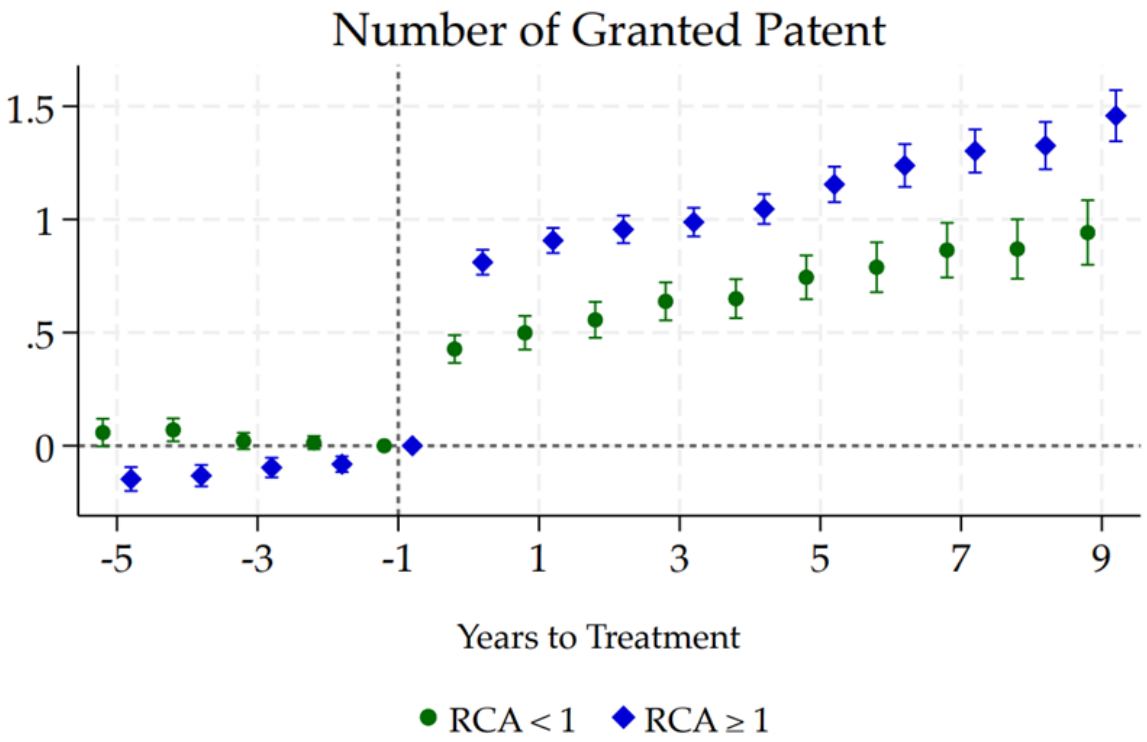
Few cities targeted sectors with pre-exisiting comparative advantage

Fig. 10: Treated cities and their RCA before SEI rollout



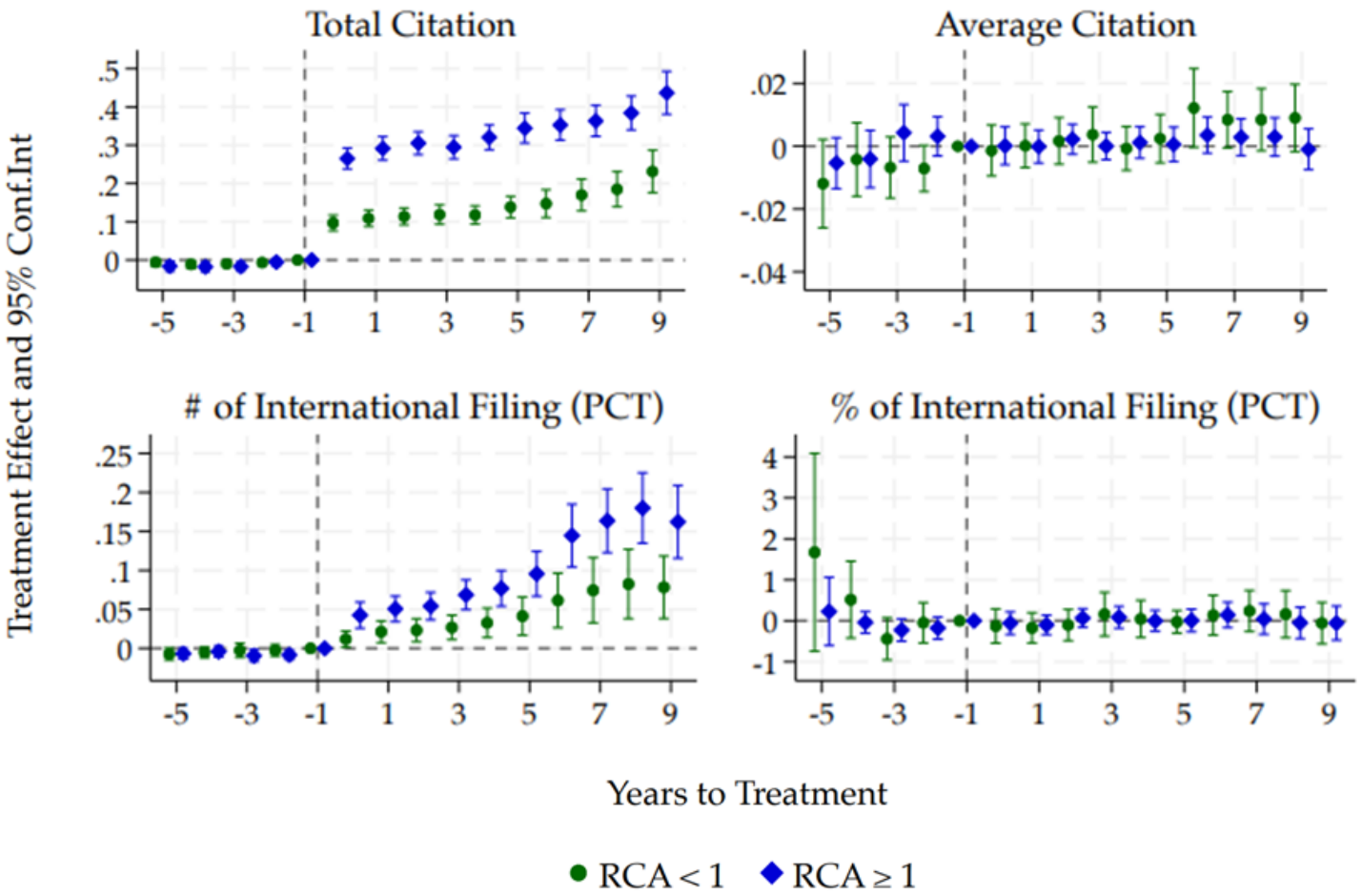
Comparative advantages are associated with higher innovation quantity

Fig. 11: Event study estimates by RCA levels: impact on innovation quantity



However, scale effects explain most of the quality gains

Fig. 12: Impact of SEI on patent grant count



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Industrial policy isn't unique to China

IP is rising globally across many overlapping SEI sectors:

- Biden's Chips Act (US, 2022)
  Korean New Deal (South Korea, 2020) → "Semiconductor and 5G"
- Society 5.0 (Japan, 2016)
  Digital Pakistan (2018) → "High-end manufacturing"
- Industry 4.0 (Germany)
  European Green Deal (EU, 2020) → "EV & New energy"

Lessons from the SEI experience

- Innovation quantity surged; quality did not follow
- SEI works, but at the expense of non-targeted sectors
- Comparative advantage helps, but only on the quantity margin

Thanks!

Appendix: Robustness Checks

- Placebo tests
- PPML for zero values
- Exclude discontinued policy sectors (small share)
- Balanced panel (remove zero values)
- Green sector controls

Appendix: Robustness Checks – Placebo Test
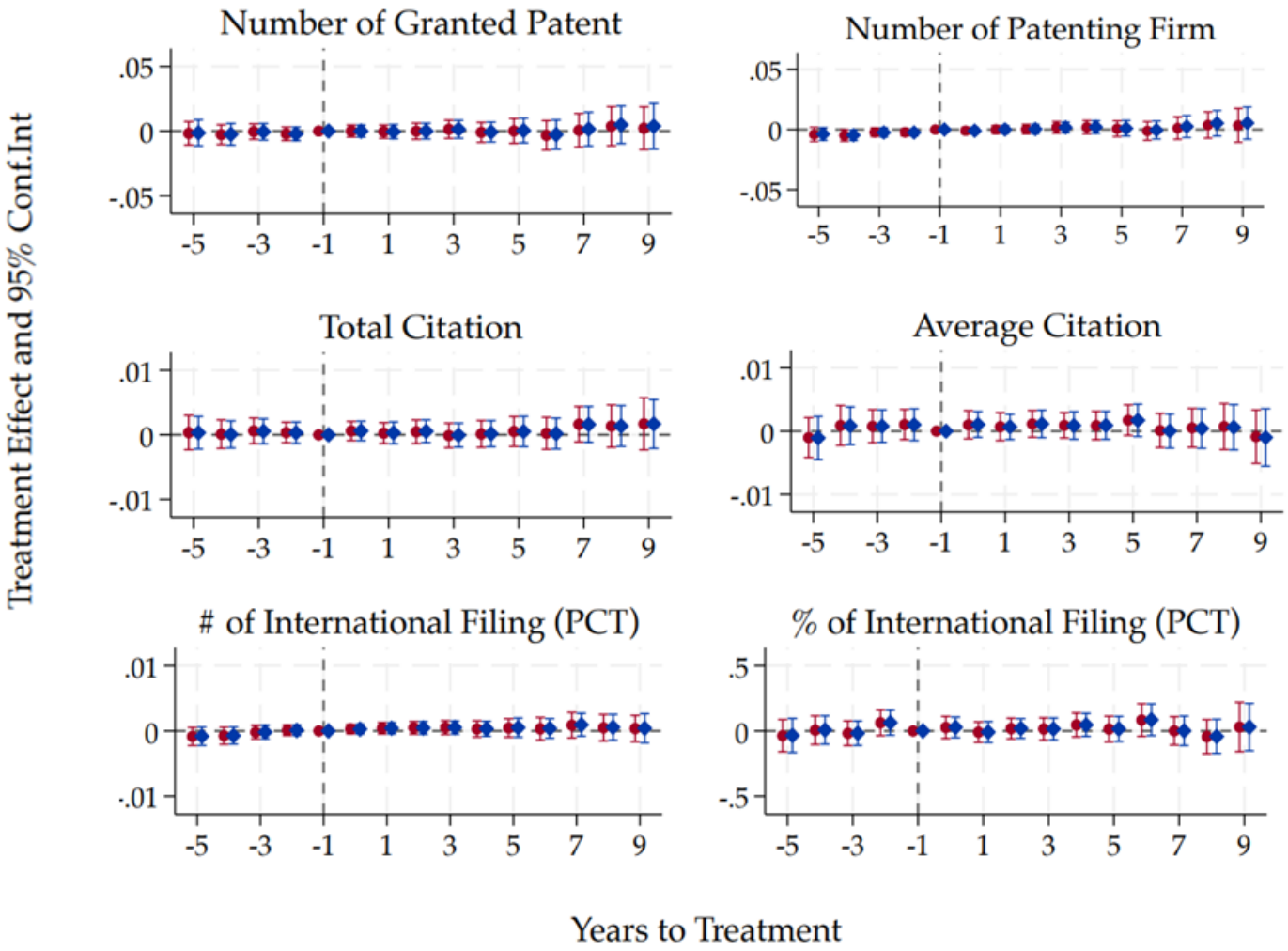
Fig. 13: Impact of SEI on selected variables – placebo test