The Value of Cleaner Waterways: Evidence from the Black-and-Smelly Water Program in China

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Summary

- Research question
  - The economic impact of water cleaning programs
    - Housing market and business entry
- Importance
  - Severe water pollution problem, esp. in developing countries
    - Threat to sustainable & inclusive growth
  - Environmental programs
  - No consensus on the cost-effectiveness

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Summary (cont.)

- This paper: the Black-and-Smelly Water (BSW) program as a natural experiment
  - A major urban environmental program in China targeting heavily polluted waterways
  - DID: Treatment (control) group–areas near (far from) BSW sites
  - A rich set of datasets
    - Apartment transaction records of six major cities from multiple major real estate agencies
    - Point of Interest (POI) from Gaode Map

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Summary (cont.)

- House price response
  - Before: Treated properties are subject to a 3.7% discount
  - After: Treated properties experienced a 2.3% market value appreciation
  - Benefit-cost ratio: 12
  - Entirely driven by densely populated or expensive areas
- Supply of new apartments
  - # new apartment complexes unchanged; % high-end units goes up
- Service business entry
  - Increase in recreation centers, restaurants, etc. along the BSW riverbank

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Scope of the policy

Before and after the program, Futian River, Shenzhen

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Scope of the policy (cont.)

- As per “the Guide”, the program only involves direct treatments on polluted water
  - E.g., controlling source discharges and intercepting pollutants, etc.
  - KPI: physicochemical index on water quality
- In practice, may “attract” other government expenditure
  - Independently affect house prices
- Testable based on POI (non-business public facilities)
  - Parks, length of pavements, etc.

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Scope of the policy (cont.)

- Not necessarily a violation of exclusion restriction
  - Part of the policy bundle
- But relevant to cost-benefit analysis
  - Overestimate the benefit-cost ratio
- External validity
  - E.g., the US Clean Water Act: restriction of pollutant discharge
    - Much weaker increase in house price
  - Interactive effect of the direct vs indirect investments

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Externality along the stream

- Current focus: waterways exactly identified as BSW sites
- Downstream areas may also enjoy the benefit
  - Otherwise, may underestimate the program benefit
- Upstream areas: placebo(?)
  - Depending on the pollution treatment method

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Distributional effect

"…owners of apartments close to BSW sites, who were generally less affluent before the program, acquire most of the property value appreciation…"

- Response entirely driven by high-house-price areas
- Renters in the treated areas

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Distributional effect (cont.)

- Source of the distributional effect (response heterogeneity)

Before and after the program, Xiaotaihou River, Beijing

  - Higher treatment intensity vs. larger response per dollar of investment
  - POI data on non-business public facilities may help

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Sorting

- House price not based on repeated sales
- Sorting in the new-apartment market
- May apply to pre-owned apartments as well
  - Can be explicitly tested
- Additional (robustness) tests
  - More flexible controls for characteristics (e.g., time-area-varying)

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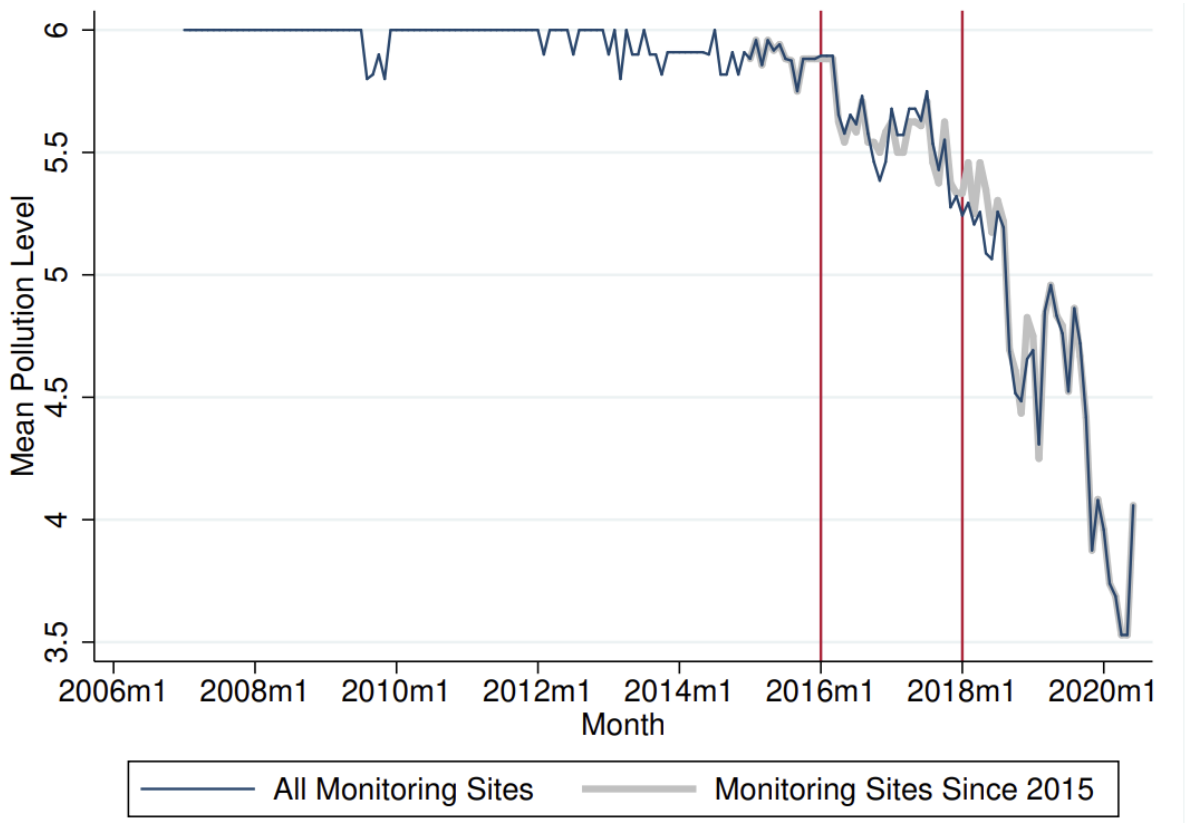
First stage

- Truncated data: bounded above



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Concluding Remarks

- Important paper answering an urgent question
- Well-executed and well-written
  - Enjoyed reading this paper and learned a lot!
- Looking forward to seeing the published version on a top journal

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