Discussion of:

"Strategic Capture of Monitors: Evidence from Pollution Control in China"

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ABFER 2026

Paper Summary: Setting & Design

Setting: China's 2016 outsourcing reform transferred O&M of ~1,500 national air monitoring stations from local governments → 6 third-party firms selected by the central government

Core Argument (Three-Step Logic)

- Step 1: Post-reform, local governments disproportionately award procurement contracts to the O&M firm assigned to their city
- Step 2: After signing these "related" contracts, ground-based pollution readings decline while satellite-based measures remain unchanged
- Step 3: Environmental enforcement actions decrease for firms near monitors (within 15km) but increase for more distant firms (30-45km)

Supporting Evidence

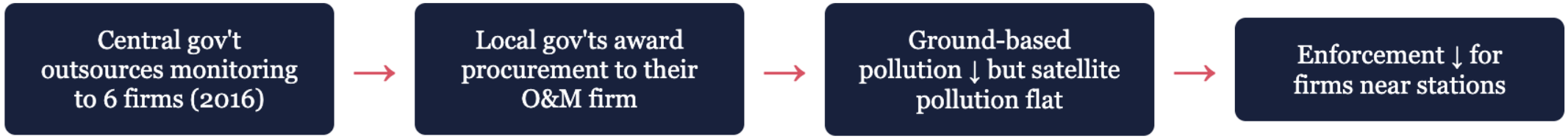
- Effects driven by promotion-eligible officials (age ≤ 57 at NPC)
- Back-of-envelope: collusion undoes 65-130% of reform's pollution improvements in affected cities

What I Like About This Paper

- **First-order question for institutional design:** How robust are third-party monitoring arrangements to strategic responses by the monitored party? Extremely policy-relevant beyond China.

- **Novel contribution vs. prior literature:** Documents *endogenous creation* of collusive ties, rather than exploiting pre-existing connections (cf. Duflo et al. 2013; Chu et al. 2021; Vannutelli 2022).

- **Compelling multi-layer evidence:** Reform → procurement → under-reporting → enforcement. Each step reinforces the story.



China's Air Pollution Monitoring: Policy Evolution

~2008-2012 **Blue Sky Day Era:** Limited monitors; API-based system; cities self-report "Blue Sky Days"
→ *Ghanem & Zhang (2014, JEEM): Documents manipulation via bunching at Blue Sky cutoff threshold.*
Problem: Direct data manipulation by local authorities; minimal oversight

2013 -2015 **Technology-Aided Monitoring :** Action plan with pollution Targets; AQI System; national network of ~1,500 automated monitoring stations constructed across 367 cities
→ *Greenstone el al.(2022, AER:Insights): Real-time automated monitoring technology can discipline local officials; Direct data manipulation became hard.*
→ *Yang el al.(2024, AEJ:Policy): Technology-aided monitoring improves enforcement but induces localized pollution abatement (near stations).*
→ *Axbard & Deng (2024, AEJ:Applied): Real-time monitoring reduces pollution via informed enforcement; estimates 0.42-0.86 μg/m^3 $PM_{2.5}$ reduction.*
Problem: Stations still operated by local environmental bureaus; physical interference with station equipment

Late 2016 **Third-Party Outsourcing Reform:** O&M of national stations transferred to 6 private firms
→ *Fisman, Wang & Ye (2026, this paper): Local governments strategically capture monitors via procurement contracts; 65-130% of reform gains undone in affected cities.*
New problem: Indirect manipulation

End of 2017-2018 **Winning War on Pollution** (*Greenstone et al. 2021REEP*)

Real-world Example

人民网 people.cn 人民网

环境监测数据造假 生态环境部约谈临汾市政府负责人

2018年08月06日14:37 来源：人民网 分享到：

人民网北京8月6日电 据生态环境部官网消息，今日，针对环境空气自动监测数据造假问题，生态环境部联合山西省政府对临汾市政府主要负责同志进行了约谈。

约谈指出，2018年3月底生态环境部组织检查发现，临汾市6个国控空气自动监测站部分监测数据异常，采样系统受到人为干扰，并在查实有关情况后依法移送公安部。2018年4月11日，公安部将案件移交山西省公安机关。山西省迅速组织侦破，抓获16名犯罪嫌疑人，并依法移送起诉。经调查，临汾市环保局原局长张文清授意局办公室主任张烨和监测站聘用人员张永鹏，组织指使许冬等人故意实施破坏环境空气自动监测数据行为。2017年4月至2018年3月，张永鹏组织人员通过堵塞采样头、向监测设备洒水等方式，对全市6个国控空气自动监测站实施干扰近百次，导致监测数据严重失真达53次。

2018年5月30日，晋中市榆次区人民法院以“破坏计算机信息系统罪”对涉案16人作出判决：主犯张文清被判处有期徒刑两年；主犯张烨、张永鹏分别被判处有期徒刑一年。13名从犯中，负责监测站运维工作的原河北先河科技环保股份有限公司员工崔勇勇、张安分别被判处有期徒刑8个月和6个月；其余11人分别处以拘役4至6个月，缓刑8个月至一年不等的处罚。

热点推荐

习近平眼中的“强美富”

习近平心中的人民城市

志愿服务，习近平总书记这

燕山怀中这泓水 总书记一直

特殊之年 感受习近平的“三农

精彩推荐

学习有方

City: Shanxi, Linfen
Year: 2018
O&M: One of the 6 firms, from Hebei

Blocking sampling inlets, spraying water on sensors, blowing air towards sampling ports with electric fans, and powering off and restarting monitoring equipment at night.
→ 30-50% false reduction

Consequence: 16 individuals were detained (environmental protection bureau officials and staff from third-party O&M).

Former Director Zhang Wenqing was sentenced to two years in prison, while multiple defendants were convicted of the crime of sabotaging computer information systems.

The involved third-party O&M company had its qualification revoked, was imposed fines, and was listed on the industry blacklist.

Six O&M Firms

国家环境空气质量监测网运维机构名单

日期：2017-03-09 00:00

【字体: 大 中 小】

1.河北先河环保科技股份有限公司
2.安徽蓝盾光电子股份有限公司
3.厦门隆力德环境科技开发有限公司
4.青岛吉美来科技有限公司
5.河南鑫属实业有限公司
6.武汉宇虹环保产业发展有限公司

1. What's really been done? What can the data tell us?

❑Only discussed, not tested empirically

- Spraying water surrounding the stations (fog canon truck), relocate point sources away, shut down small and polluting business nearby, traffic diversion, planting more trees near by, etc. (Literature and government documents verified)

→both ground-monitors and satellite reading should see reduction, though very locally

- Shutting down monitors, stuffing cottons, spraying water to sensor, equipment tampering, direct manipulation on reported data, etc.

→No real pollution reduction efforts, only ground-monitors can show reduction

→Should be what this paper infer

1. What's really been done? What can the data tell us?

✓Suggestion:

❖Use other data sources to test directly: missing data, unusual drops during night, sudden drops, malfunction reports, etc.

→Are these data patterns more severe when pollution surges, or less obvious when other inspectors are in town?

❖How much "reduction" is enough?

→Any bunching around a threshold satisfying the "Very Good" or "Good" standard, or annual reduction amount meets centrally assigned target, or the more the better?

2. Validity of Satellite Data as a "Truth" Benchmark

❑Is 10km resolution too large to serve as a benchmark?

- Key Concern: Pollution Relocation
- If polluting activities are relocated from within 3km of stations to the 3-5, 5-10km ring:
- Ground monitors would show lower readings (real reduction at station)
- Satellite at 10km resolution would show no change (pollution averaged across larger area)
- This pattern is observationally equivalent to data manipulation.

❑Measurement Errors in satellite data

- Key Concern: Attenuation Bias
- Satellite data may fail to detect real changes, thus show no effect

2. Validity of Satellite Data as a "Truth" Benchmark

✓Suggestion

- Use AOD data in a finer resolution as benchmark for robustness check
- Spatial pattern will imply the real collusion mechanism as well
- Appendix Figure A1 helps, could be further expanded to other distance ranges and bring to the main text.

3. Value of Procurement Contracts

❑How serious should we treat the “related” procurement contracts as collusion? What are local gov’s alternative options?

- Most procurement contracts are meant for operation and management of other locally constructed monitors (province/city/county-level stations)
  - It seems natural for local government to sign contracts with the same O&M firm that is assigned for their central stations, for reasons other than deliberate collusion? (Easier to contact and manage, and maybe cheaper)
  - Which firms initially work for them to help manage the local stations?

❑How much do the procurement contract between those 6 O&M firms and the central government value?

- The “related” contracts are not expensive, how much risk are the O&M firm willing to take to collude (earn a local contract) vs. being caught and punished (lose the central contract and more)

4. Enforcements Result

❑What does enforcement result imply?

- If nearby large firms gets less enforcement, while further away small firms get more, why wouldn’t the satellite data capture pollution increase within 15km and pollution reduction far away?
- If the colluded O&M firm turns a blind eye on local tampering behaviors, why would local officials increase enforcement on far away firms? Does this mean there are other political incentives on real pollution reduction efforts?
- Show that firm count within 15km doesn't decline post-procurement (ruling out exit)

5. Overall message and tune

❑Did the Third-Party Reform Make Things Worse?

- Before the outsourcing reform, stations already had automated data uploading under central government regulation.
  - Central government also have rules for punishing data manipulation, equipment tampering, etc. (Similar cases as Linfen have also been caught and reported many times before 2016.)
- Central government has other inspection plans, like the month-long central inspection, random inspection by local and upper level governments.
  - Existing literatures show less direct data manipulation (i.e., higher pollution reading after automation), local but real pollution reduction and enforcement efforts, general city-wide pollution reduction.
- Does the third-party reform only make local governments easier to manipulate? (they know the exact target to “bribe”)

→Quite pessimistic message comparing to existing literature

→Real situation may not be that bad

5. Overall Message and Tune

A More Nuanced Interpretation:

- The reform **raised the cost of manipulation**: from free (local bureau just tamper readings) → costly (must award real procurement contracts worth real money). This is still beneficial even if imperfect.
- What does the back-of-envelope: 65-130% offset mean? Benefit vs. Cost to local government, and to the society?
  - only in cities with related procurement

Other comments and suggestions

- Non-EPB procurement: Do local governments also increase procurement with O&M firms through non-environmental bureaus? If so, it suggests broader relationship-building.
- Exploit variation in contract size — do larger contracts predict bigger pollution drops? A "dose-response" relationship would strengthen causality.
- Beyond PMs, other pollutants that the ground monitors captures may not be affected by other policy incentives and show real collusive actions local governments take.
- Second-round contracts (2019-2021): Even with COVID confounds, it would be informative to know whether the central gov't adjusted procedures in response to first-round capture
- Provide anecdotal evidence on O&M firms **caught or penalized** for collusion as supporting evidence

Very important, policy-relevant paper

- Important and broadly relevant phenomenon.
- Creative use of procurement data to identify collusion
- Compelling promotion-incentive heterogeneity
- Concrete empirical analysis
- Clean first-stage (reform → related procurement)

- The second-stage interpretation (procurement → manipulation) needs strengthening.
- I look forward to seeing the future version and the real impact this paper would make to better monitoring policy design in the near future.