

Discussion of  
“Going Green with Inadequately Supervised Playgrounds for  
Local Governments”  
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2022 Spring Workshop on Economic Fluctuations and Growth  
May 8, 2022

## Brief Summary

- ▶ a very interesting empirical paper based on *micro evidence* aiming for rich *macro implications*
- ▶ background: rising interests in evaluating the impacts of “regulations for environmental protections”
- ▶ examines the impacts of the “Action Plan” (《大气污染防治行动计划》(2013年9月10日引发实施)) on the prefecture-level economic outcomes
  - key findings: those prefectures facing tighter regulatory restrictions as measured by the requirement of  $SO_2$  abatement
    - slower growths in industrial firms' revenue, local GDP and local tax revenue
    - greater growths in local LGFV debts and “other payable” type of local debts
    - little changes in land financing or land allocation

# General Comments

- \* a well executed paper with a wide range of interesting results
- \* Mostly suggestions and rough thoughts
  - overall assessment of the cost-benefit analysis for the regulation
  - pricing implications on the LGFV bonds
  - LGFV debts and the local GDP
  - regulatory compliance issue
  - additional details

## Recap

- ▶ Though so far completely empirical, a rough sketch of a model featuring local government's *dynamic* optimization cleans up a bit:

$$\max_{d_i} U(c_1^i) + \beta U(c_2^i)$$

$$\text{s.t.} \quad c_1^i = y_1^i - \xi_i \cdot AP + d_i \quad (1)$$

$$c_2^i = y_2^i + (\xi_i \cdot AP)(1 + r_{AP}^i) - d_i(1 + r_d^i) \quad (2)$$

- prefecture  $i$ 's current and future consumption  $c_t^i$  for  $t = 1, 2$
  - cost 1:  $AP$  regulatory requirement on air pollution (emission, abatement requirement) since 2013
  - cost 2:  $\xi_i$  prefecture heterogeneity in regulatory tightness
  - endogenous reactions of local governments  $d_i$ : issuance of local debt
- ▶ Empirical estimations: semi-elasticity of  $\log d_i$  with respect to  $\xi_i \cdot AP$

# 1. overall assessment of the cost-benefit analysis

- ▶ this paper: highlighting the intra-period “substitution effects”  $d_i$  vs.  $\xi_i \cdot AP$ 
  - side note:  $d_i$  can be better captured by the LGFV bond issuance, given financial constraints of local governments
  - i.e.  $d_i \uparrow$  compensates enlarged cost of the pollution control
- ▶ to better understand the overall impacts of environmental regulation
  1. any *measurable* benefits from  $r_{AP}^i \geq 0$ , cost as “investment”?
- ▶ debt offsets the economic cost is good but the true question is that: is there anything good per se with regulation on emissions? (intertemporal substitution?)
- ▶ overall welfare analysis on the discounted sum of total welfare  $U(c_1^i) + \beta U(c_2^i)$  driven by debt increase vs. driven by  $r_{AP}^i$  ?
  - so far, empirical specification captures the “effects on impact” and not a dynamic setting

## 2. pricing implications on the LGFV debts

- ▶ this paper: so far focusing on the scale impacts, i.e. “growth in local debts”
- 2. if  $r_{AP}^j > 0$ , in equilibrium, debt issuance should have pricing implications on  $r_d^j$
- ▶ cost of issuing debts may cover increasing credit risk, which partly offsets the increasing LGFV debts
  - testable: bond spread changes for different regions with varied tightness of emission abatement after 2013
- ▶ interestingly, little changes in land financing? may be due to the *price effects*
  - governments cannot supply additional lands for financing (apart from being controlled by the central gov), given that cost of financing can be higher (land price incremental would be lower)

### 3. relationship: LGFV debts and local GDP

- ▶ my model sketch:  $d_i \uparrow$  helps increase  $c_i^1$
- 3. testable but hard for causal inference: is issuing LGFV debts really helps increase the local GDP by offsetting the cost of regulation?
  - worthwhile to do: unconditional correlations between LGFV debt issuance and the local GDP growth
- ▶ a more complicated endogeneity issue:
  - may doable:  $\xi_i$ , local regulatory tightness already factors in the trade-off between local GDP and regulatory tightness? or, trade-off between the implicit guarantee and regulatory tightness?
- ▶ e.g. 《大气污染防治行动计划》: 京津冀、长三角、珠三角等区域细颗粒物浓度分别下降 25%、20%、15% 左右
- ▶ doable: to differentiate the story of (1) issuing larger amount of debt to walk around the tighter environment constraints, or (2) simply because of greater government implicit guarantee?

## 4. local regulatory compliance issue

- ▶ introduced  $z_i$ , measuring the local prefecture's degree of “shirking”, i.e. the intensity of non-compliance with the regulation requirement

$$\max_{d_i, z_i} U(c_1^j) + \beta U(c_2^j)$$

$$\text{s.t.} \quad c_1^j = w_1^j - z_i \xi_i \cdot AP + d_i \quad (3)$$

$$c_2^j = w_2^j + z_i (\xi_i \cdot AP)(1 + r_{AP}^j) - d_i(1 + r_d^j) \quad (4)$$

### 4. shirking without compliance helps with maintaining the GDP?

- ▶ maybe testable: 2018 关于《大气污染防治行动计划》实施情况终期考核结果的通报
  - those prefectures with greater debt issuance more strictly complied with the regulation requirement?



## Other Details

- ▶ better to display the coefficients of other regressors and controls in regression tables
- ▶ try cleanly separating the discussions from stating the empirical specifications and interpreting the results
- ▶ post-2013: as for the LGFV debt issuance increase, alternative stories: (1) corporate bond default risk hiked since 2014; (2) regulations introduced on local governments debts: e.g. 2014 年 9 月, 国发 43 号文《国务院关于加强地方政府性债务管理的规定》
- ▶ specific stories behind the facts: macro-finance (systemic risk, shadow banking, short-run vs. long-run trade-off) vs. applied micro focus (local governments tournament, government officials promotion)
- ▶ local government official's incentives: GDP competition vs. environmental concerns

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- ▶ local government official's incentives: GDP competition vs. environmental concerns
- ▶ a really interesting paper with an important research question answered

**Best of lucks!**