Discussion of
“Going Green with Inadequately Supervised Playgrounds for
Local Governments”
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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:

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

  s.t.

  \[
  c_1^i = y_1^i - \xi_i \cdot AP + d_i \\
  c_2^i = y_2^i + (\xi_i \cdot AP)(1 + r_{AP}^i) - d_i(1 + r_d^i)
  \]

- 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 $r_{AP}^i > 0$, in equilibrium, debt issuance should have pricing implications on $r_d^i$

- 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

\[
\begin{align*}
\max_{d_i, z_i} & \ U(c_1^i) + \beta U(c_2^i) \\
\text{s.t.} & \quad c_1^i = w_1^i - z_i \xi_i \cdot AP + d_i \\
& \quad c_2^i = w_2^i + z_i(\xi_i \cdot AP)(1 + r_{AP}^i) - d_i(1 + r_d^i)
\end{align*}
\]

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?
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)

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a really interesting paper with an important research question answered
Best of lucks!