CAN REDUCING CARBON EMISSIONS IMPROVE ECONOMIC PERFORMANCE? EVIDENCE FROM CHINA

(Economics-2948-1)

Summary and assessment

This paper presents an ambitious empirical analysis of China's Low-Carbon Policy (CLCP) pilots. Within a standard econometrics policy-evaluation framework the authors offer both a macro- and a micro-economic perspective.

In 2010, Chinese authorities identified five provinces and eight cities as pilot entities for their 'low-carbon policy'. Using the variation generated by this pilot, the authors set-up a series of diff-in-diff estimations using the pilot provinces (and cities) as treated entities, and the remaining as controls. From the macro-economic point of view, the authors use GDP and per-capita GDP as their outcome variables, and introduce a broad range of firm-level variables as outcome variables to analyze the impact of the regulation at the micro-economic level.

The results discussed in the paper suggest that the CLCP pilots have been a resounding success. To cite the authors' summary:

> *The results show that the CLCP policy significantly promotes the economic growth of local cities. At the same time, the dynamic effect test shows that environmental regulation has a long-term promoting effect on economic growth [...] According to the analysis of microenterprises, it can be seen that although the CLCP policy can increase the production costs of enterprises, it also significantly promotes the output and income of enterprises. Instead of exiting from the market, enterprises address the increased costs in a more proactive way. On the one hand, enterprises constantly strengthen internal management and improve productivity; on the other hand, enterprises constantly input more resources to conduct innovative activities to overcome the increase in cost and to realize the improvement of enterprise income.*

Not surprisingly, they conclude that:

> *this article shows that environmental regulation and economic development can achieve a "win-win" situation and fundamentally revises the traditional concept that environmental regulation restrains economic growth.*

My personal view of the paper is more restrained, and I am suggesting a few points for the authors to consider below.

Comments

i. The paper uses some well established methodes and cites much of the standard literature. The authors also provide a significant number of 'robustness checks' and overall contribute a well-rounded paper from the technical point of view. What I am doubtful about, however, is whether the pilot they focus on lends itself to the methods being deployed and to the consequence causal interpretation of the results.

   Fundamentally, I would like to have a much deeper discussion of the CLCP, its aims, and the details of the implementation. There seems to be a very broad policy drive and a large number of initiatives taking place. Causal identification in this context is a challenge. The main question that I would like the authors to address is how the selection of the provinces and cities for the pilot took place. It is obviously not random, and this fact alone needs discussing. Anything that makes these pilot cities/provinces 'special' and which correlates to the outcome variables, potentially invalidates the identification strategy.

ii. Despite the large number of tests and the effort put into convincing the reader of the robustness of the results, I remain unconvinced, mostly because there is very little discussion of the economics mechanisms at play. Why, for example, would economic growth be boosted by stringent environmental regulation even in such a short period of time? It makes very little sense to me. Unless the authors make a convincing case for their results, my default response is that this statistical results are a figment of a poorly designed policy evaluation framework and are spurious.

iii. The authors have a tendency to proceed in a rather mechanical fashion. They seem to be aware of the key ingredients they need to add to their DiD-type paper, and they do all the 'right' things, but often without much thought. The authors interpret their pre-trends analysis in a very positive way, writing

> *As seen from the figures, the effect of year before 2010 is not significant, which indicates that the parallel trend hypothesis is satisfied, while after 2010, the policy effect gradually increased, which indicates that the policy has a long-term promoting effect on economic growth.*

   While this is technically correct, on closer examination Figures 2 and 3 seem to indicated that both gdp and per-capita gdp have been diverging for some time between treated and non treated groups, with trends starting around 2005. A discussion of this evidence is fundamental to trust the results in Table 2.

iv. In Tables 2-8 the values of the R^2 are eye-catching large, in excess of 0.97 almost everywhere. The authors should discuss this aspect of their results and reflect on their modelling strategy.

v. The micro part of the analysis is much weaker in many ways than the macro part. There is little in the way of a motivation for the selection of the outcome variables, no discussion of the goal of the analysis, and virtually no attempt to

explain the results or to investigate the mechanisms that might be driving them. I would strongly advice the authors to focus on fewer outcomes, while providing better discussions of the events, possibly testing alternative explanations that potentially give raise to the same outcomes.

vi. The paper is hard to read, and should be thoroughly proof-read. There are odd mistakes in the text that detract from the paper and should have been easy to avoid. 'Ecological economics' vs 'environmental economics', 'pollution paradise', really!? But also 'micro-enterprises' for 'firms', etc.

Overall, an interesting topic and a display of decent skills, ultimately resulting in a rather modest paper.