Report on AER-2019-0681 "Pigou Creates Losers: On the Implausibility of Achieving Pareto Improvements from Efficiency-Enhancing Policies"

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This paper addresses the question under which conditions the efficiency gains from Pigouvian taxes can be redistributed in a way that a Pareto improvement is achieved. Take a gasoline tax as an example. Its introduction will reduce gasoline consumption and all individuals would gain from the fact that less carbon is emitted. Those households that consume a lot of gasoline would lose because the additional costs for them likely outweigh the benefits from less carbon emission. Those who consume very little a lot of gasoline are likely to benefit. By construction of the Pigouvian tax, the aggregated compensating variation would be positive: monetized utility gains + tax revenue gains add up to a positive number.

Can we turn this potential Pareto improvement into an actual Pareto improvement by making beneficiaries compensate the losers? A naive approach would be to have a transfer that depends on gasoline consumption. But this would of course undo the positive incentive effects of the Pigouvian carbon tax. The author considers an alternative way which is to make the transfer contingent on exogenous, observable variables X. In the case, where one could perfectly predict gasoline consumption by X, one could obtain an actual Pareto improvement. However, the smaller the predictive power of X, the less able is the policy maker to target losers. Based on these thoughts, the author derives an empirical test for whether a Pareto improvement is possible (Condition 1 on page 9). This condition shows that the Pareto improvement is only possible if the gasoline consumption can be sufficiently well predicted by X.

The author then tests this condition for the case of (i) gasoline, (ii) electricity consumption, (iii) natural gas, (iv) tobacco and (v) alcohol. The author makes use of CEX data. The conclusion is that the predictive power is not high enough and therefore it is not possible to create a Pareto improvement. The heterogeneity in consumption cannot be sufficiently well explained and therefore compensating transfers will be imperfectly targeted such that a sizable fraction of households will be losers of the whole policy reform (Pigouvian tax + transfer compensation scheme).

Overall assessment: I enjoyed reading this paper. It makes a nice point: the bulk of heterogeneity in consumption of goods like gasoline, electricity, natural gas, tobacco and alcohol cannot be predicted. A bulk is hence unobserved preference heterogeneity that cannot be targeted. This is intuitive. Yet of course the answer is not a priori clear and is an empirical question. The contribution of this paper is to formalize this idea and then empirically test it for the U.S. for the arguably most important examples when it comes to negative externalities.

Comments

1. **What is X?** What I find surprising is that the author did not provide a more thorough discussion about what X could actually be. While it is clear in Section 4.3 which variables are used, I was missing a more thorough discussion about this issue. While I find the chosen variables plausible, I would have liked to see e.g. a discussion that this selection was limited by the set of variables that are available in the CEX.

   I like the machine learnings approach a lot, which confirms that the author chose a very reasonable set of variables (out of those available in the CEX). Machine learning barely leads to an improvement.

   But couldn't it be that the CEX just does not have the information that we need? If so, maybe this information could easily be obtained for the government? I do not really think that this is the case, but think it is important to add at least a short discussion on this issue. At the end this paper is saying the we cannot predict well the consumption of different goods that cause negative externalities. But of course this depends a lot on what X is...

2. **Conceptual questions: why not targeting on previous consumption?** Related to the previous point: why not just using *past* gasoline consumption? This should be strongly correlated but is nevertheless exogenous. Of course I understand that this would only work for a transition period since for some cohorts this past information will not be available since they did not consume before the introduction of the tax.

3. **Write up.** I think that the paper could be shortened substantially. It has a clear and interesting message. But for example, I find the introduction quite long for example. Do we really need the discussion about the concept of Pareto improvements on page 5/6? While I find this discussion interesting, I think it's a bit too much for an economics outlet since the concept of Pareto improvements is really something economists know about.

4. **Section 2:** I found the way section 2 is written up not ideal as some things to me a while to understand. For example, I was quite confused by the concept of the consumption gap $\bar{\Delta}$. It would be great to directly explain that it would be zero if the initial tax were zero and we

were considering a small tax increase. Even though I understand well the concept of the dead weight loss, I was confused why $\bar{\Delta}$ is not always equal to zero when I read it the first time. The discussion at the beginning of Section 2.1 is something I would have loved to read when $\bar{\Delta}$ is introduced.

Also I think pages 8-11 (here I mean everything in Section 2 before 2.2) could be more clear if they were structured differently. I would have preferred to first see a very clean description of the environment first before I see Condition 1.

5. **Mechanism Design.** This discussion seemed quite superficial to me. Certainly it was not clear for me. I agree with the author that a mechanism-design approach would always imply that some efficiency gains would be 'lost' because agents obtain informational rents. Still, at first sight I had the feeling that it would be natural to deploy a mechanism-design approach. If we can achieve a separating equilibrium, where different preference types reveal their type, then we would obtain a condition similar to *Condition 1.* The difference would be that now we have perfect targeting but targeting is costly (due to informational rents) and hence it is unclear whether the efficiency gains from the Pigouvian tax would be sufficient to cover costly targeting? I actually doubt that it would work since individuals could only reveal their preference type through consumption of the gasoline tax. And hence, we would have to condition transfers on consumption of the gasoline tax. Isn't that the reason why the mechanism-design approach is unusable here?

   Apart from this general thing, I did not understand the meaning of the sentence: "Moreover, the imposition of budget balance consistent with the setup here is typically constraining in such settings."

   Lastly, I did not get what was meant by: "For example, suppose there was simply an opt-out option where agents could avoid the tax but would not be eligible for a transfer." Why should there be an opt out option? What is the equivalent to this opt out option in an indirect mechanism?