Local Pollution Drives Global Pollution: Emissions Feedback via Residential Electricity Usage

Some comments, questions, suggestions

This paper:

- Highlights an important issue (the indirect effects of outdoor air pollution on electricity demand) which has been overlooked so far and illustrates the complexity of measuring externalities
- Quantifies the impact of air pollution on residential electricity demand using a novel and comprehensive dataset and identifies the main channels (more time spent at home and increased use of AC)
- Policy implications: co-benefits of reducing PM 2.5 levels
- Well-documented, robust, and convincing results
- Very nice paper to read
- Very didactic: the paper describes the methodology that has been followed on a step-by-step basis; discusses each of the possible limitations of the empirical exercise

One main “conceptual” question:

- There is evidence that air pollution makes households spend more time at home and increases use of AC, so residential electricity demand increases

- But how to infer global impact in terms of GHG emissions?

- What is the counterfactual? What if households had decided to go out instead of staying at home?

  Would likely increase usage of cars and public transportation $\rightarrow$ more traffic congestion $\rightarrow$ increase GHG emissions from vehicles

  How does the change in GHG emissions from higher vehicle usage compare to the change in GHG emissions from increased household electricity demand?

Complex measurement of externalities - Which policy recommendations?

- The use of AC increases electricity demand (and GHG emissions) but allows households to better protect themselves against outdoor air pollution

- Should AC be subsidised to increase take-up and help poorer households get better protected against air pollution? Problematic since higher use of AC increases electricity usage.

- Targeting outdoor air pollution? How? Carbon tax on fuels used by vehicles and/or electricity consumption? Usually seen as regressive policies.

- Existing policy in Singapore: vouchers to help households in public housing pay for electricity (and water) bills. May indirectly encourage the use of AC. Is this good or bad?

Question of environmental justice seems quite promising

- Rich vs. poor households in Singapore: rich households can better protect themselves against air pollution by using AC $\rightarrow$ reinforces inequality in terms of health risk faced by rich and poor households

- Relates to literature on households' perception about risk and climate-change related issues in relation to their wealth. The ability of richer households/countries to cope with adverse impacts due to climate change (air pollution, increased temperature) makes them feel less concerned about climate-change issues (Lo, 2016).

- Inequality across countries in Asia: high focus on outdoor air pollution but indoor air pollution is causing a high number of deaths in rural areas of a number of countries due to HH combustion of fuels (coal, wood or kerosene) using open fires or basic stoves. In Singapore households remain indoor to avoid outdoor air pollution while in poorer rural areas in Asia indoor air pollution involves higher risk than outdoor air pollution.