Environmental Economics II
Economics 7103

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Research ideas assignments
Week 2

1. *How the Environmental Justice(EJ) gap changed following the 2009 introduction of the Regional Greenhouse Gas Initiative(RGGI).* (except New Jersey because it left and then again rejoined the RGGI and I aim to study this state separately).
   Disclosure: I borrowed this idea from Hernandez-Cortes and Meng (2023). They did similar work in the California market. Initially, I intend to closely replicate the empirical strategy employed by them.

- **Hypothesis:** [a] The RGGI introduction decreases carbon emission in the member states; [b] The RGGI introduction increases carbon emission in the neighboring states; [c] The RGGI introduction decreases EJ gap in the member states; [d] The RGGI introduction increases EJ gap in the neighboring states;

- **Ideal experiment:** I should compare the emissions of the plants before and after the introduction of the RGGI. I need to identify disadvantaged communities for studied states and then measure the EJ gap before and after the RGGI.

- **First steps/challenges:** My initial step involves utilizing plant-by-year-level data to assess how the implementation of the RGGI program influenced emissions of GHG, PM2.5, PM10, NOx, and SOx. I need to transform plant-level emissions into pollution concentrations at the Census block group level. This could involve employing an atmospheric dispersal model or an alternative model to generate Census block-by-year-level concentrations of GHG, PM2.5, PM10, NOx, and SOx pollutants resulting from the RGGI program. My understanding of how to use this model is very poor and I will need to learn how to use it. Lastly, I will explore whether the inception of the RGGI program in 2009 has modified the disparity in pollutant concentrations between disadvantaged communities.

2. *How has the carbon emission changed for New Jersey after leaving the RGGI in 2011?*
   Note: New Jersey re-entered the RGGI in 2020 after exiting the program in 2011. (I can also study how the carbon emission changed for New Jersey after rejoining the RGGI in 2020?)

- **Hypothesis:** adoption of a tankless water heater increases total energy expenditures for a household.

- **Ideal experiment:** This is natural experiment. I can check carbon emission levels before and after leaving the RGGI.

- **First steps/challenges:** As in the previous case, I will utilize plant-by-year-level data to assess how the implementation of the RGGI program influenced emissions of GHG, PM2.5, PM10, NOx, and SOx from 2009 to 2011, during 2011-2020, and after 2020. I will use the following data sources: Annual Emissions - Facility Level View by the RGGI, Emissions by plant and by region by EIA; Clean Air Markets API Portal by EPA.

3. How does the adoption of 100% clean energy goals impact the internal migration trends in the United States? (Do people make long-term internal migration plans based on states' clean energy policies?)

- **Hypothesis:** How do the adoption and implementation of 100% clean energy goals affect internal migration patterns in the United States?

- **Ideal experiment:** I expect that the implementation of the policies aiming to achieve these goals would improve pollution indicators, including air quality and greenhouse gas emissions, at the state and regional levels. Consequently, individuals and even businesses caring about the clean environment might consider moving to such states.

- **First steps/challenges:** Clean Energy States Alliance and NC Clean Energy have comprehensive databases of statewide adopted regulations for renewable and strategies of 100% clean energy goals. So I will be able to identify which state and when they adopted such policies. I will obtain the data on internal migration patterns from the Census Bureau. For this study, I might select those states which implemented such policies earlier like Huwaii (2015) and California (2018). The biggest challenge of this topic is that there are many more significant reasons why people make their migration decisions, but I still think that some specific groups like high-income groups or people close to retirement age might put higher weight on clean energy policies as well when making such decisions. I do not know yet how I can get information about people's opinions on this matter.