Economics of Energy and the Environment Econ 3391.01 Prof. Richard Sweeney

Term Paper Assignment

Assignment: Pose an energy or environmental policy question and answer it using real world data. You can choose any topic and the setting can be anywhere (not just in the US).

Due: 11:59 p.m. on May 8th. Late papers will not be accepted.

Length: 6 to 8 pages, single spaced, not including references, tables and figures.

Groups: You must work in groups of 4. **Groups must be submitted to me by February 12.** Changes to groups will not be allowed after that point. Anyone who does not have a group will be assigned one.

Summary of key dates:

2/12 (5 pm) - Groups due

2/19 - First group blog post due

Preliminary question due: At a high level, what question are you interested in?

What **data** would you ideally use to answer your question?

2/27 – Second group blog post due

What is your refined (ie narrower) research question? What is your empirical strategy?

- 3/19 Paper topic due (2 page writeup)
- 3/29 Blog post update on project, in class presentation.
- 5/1 + 5/3 Final class presentations
- 5/8 Paper due

Essential elements of an A paper:

- A clear research question (with a question mark at the end).
- Sound motivation:
 - Is the question motivated by economic theory, a business problem, proposed or existing policy?
- Existing literature:
 - Every paper is expected to have reviewed the existing academic literature on the subject. This should be concisely summarized in the paper. A good place to start is Google Scholar.
 - You should read and summarize these papers for yourselves. However in your writeup, papers should be tersely described in a few sentences: What was the research question? What was the method? What did they find.
 - If the paper studies essentially the same research question as your group, that could warrant a paragraph discussion of the differences and similarities.
- Data:
 - Describe the data you are using. What's an observation in your data?
 - The available data will be imperfect, compared to the experimental ideal discussed in class. You should discuss the pros and cons of your chosen data.
 - Before jumping into more sophisticated techniques, be sure to summarize the data and relate these summary statistics to the research question.
- Empirical strategy:

- What variation are you using?
 - Is there a natural experiment or discontinuity?
 - Was a policy or change implemented in some places but not others?
- I highly encourage you to use difference-in-differences for this project.
 - Exceptions will be considered on a case-by-case basis. Please ask me.
- It is worth spending a lot of time trying to come up with "good" sources of variation / natural experiments, as this will make the rest of your paper much easier to write.
- Results:
 - What did you find? Relate your conclusions to the research question.
 - What additional data would you like? What would the next steps in this project be if you continued? What additional questions does this pose?

What's a good question?

Some of the best papers in previous years asked:

- Did policy to expand the transmission grid promote wind energy in Texas?
- Did electricity restructuring in Pennsylvania reduce electricity prices?
- Does use policy to reduce domestic coal consumption increase coal exports?
- Do wind farms reduce home values?
- Do electricity prices effect the adoption of electric vehicles?
- Does public transportation reduce gasoline demand?

Some examples of other questions you might consider if you're stuck:

- How much do natural gas pipelines benefit consumers? Do they reduce prices or increase exports?
- Are solar panels and electric vehicles complements?
- Does competition appear to lower prices in deregulated markets? What about renewable energy?
- How would electricity prices or emissions change if we reduced nuclear energy? (or the converse)
- Does bike infrastructure reduce driving?
- Why are some states becoming more energy efficient (using less energy per capita)?
- In general it is also easy to motivate questions on the health impacts of energy markets, ie
 - Does fracking cause hospitalizations?
 - Does natural gas use increase the incidence of asthma?

Where to find data?

I have listed several resources on the <u>"resources"</u> section of my website. However, for most groups, I highly recommend you start with data from <u>SNL Energy.</u>

SNL has extensive data on electricity, coal and natural gas markets, including, but not limited to:

- Location, type and production of every power plant in the US
- Emissions from these plants
- Rate cases from regulated utilities
- Prices and consumption levels
- GIS data on energy infrastructure locations.

It also has data general economic indicators and demographics, as well as a good archive of industry relevant news articles. I can provide additional demographic information by US Census tract if you ask.

I will discuss SNL Energy Data in class on 2/15.

- If you have issues with SNL or need additional help, please contact the economics librarian Sarah Barbrow (<u>barbrows@bc.edu</u>)