ESTIMATING THE PRICE ELASTICITY OF ELECTRICITY: EVIDENCE FROM MUNICIPAL ELECTRIC AGGREGATION

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Research Question

We are interested in estimating the price elasticity of electricity. Our results will be useful for:

- Energy companies
  - Help them make better decisions regarding how much to charge consumers for electricity
- Policy makers
  - Help them anticipate the effects of a carbon tax, as this would lead to a higher demand for electricity. This in turn, would increase prices of electricity.

What is MEA?

- Municipal Electric Aggregation (MEA) allows counties to purchase electricity on behalf of their residents and small businesses

- MEA makes electricity relatively cheaper since residents have more bargaining power collectively

- Counties throughout Illinois voted on whether or not to implement MEA

Data

- Monthly electricity usage for almost every county in Illinois, from 2007 to 2014 – from ComEd

- Treatment group: towns that implemented MEA

- Control group: towns that did not implement MEA

- Also have town-level characteristics such as average income, population, age, etc. – from American Community Survey, as reported in 2010

Regression

- Regress electricity usage on MEA

- $U_{ct} = \beta_0 + \beta_1 MEA_{ct} + \alpha_{cm} + \alpha_y + \epsilon_{ct}$

  U electricity usage (in logs) c city   *t* time   *m* month   *y* year

- Include town-by-month and year fixed effects to account for trends in usage across months for each city as well as trends across years

- Cluster by town to account for similarities in usage within towns across time

Results

□ Test coefficient on MEA to determine if cities that implemented MEA have higher electricity usage than those that did not

□ Towns with MEA use 10.29% more electricity than those without MEA

    □ Significant at the 5% level

log_usage	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Post_MEA	0.102955	0.0168238	6.12		0.069932	.1359785

Next Steps

- We have determined there is a change in the quantity of electricity used

- Furthermore, since MEA makes electricity less expensive, there is a change in the price of electricity as well

- From this, we can estimate the price elasticity of electricity:

$$\frac{\%\Delta Q}{\%\Delta P}$$

- We will also estimate the price elasticity of electricity at the individual level