Markets for Power in the United States: An Interim Assessment

Introduction

- Mentions FERC 888, 889, 2000
- The glow that faded from higher MC prices vs AC prices.
- "Fragments of Evidence"?
  - Econ on big on making sure we describe causal effects, not just correlations.
  - We required control, or quasi-control groups for counterfactuals.

Counterfactual

- What would have happened in the absence of a treatment.
- Example:
  - Randomized Control Trial (RCT)
  - Quasi-experimental controls
- Hard to do with 50 states
  - Need stats that are very similar, one that chose deregulation and one that did not.
  - Those don't exist.
  - Or, a very good model (perfect) of why states chose to do what they do.

Standard Market Design

NOPR in 2002 but withdrawn in 2005. Many good ideas.

Check the reasons for the withdrawl in item 5.

https://www.ferc.gov/CalendarFiles/20050719123006-RM01-12-000.pdf

Discussion of ISO-NE and NYISO

- This is a nice discussion of how the parts work together.

Retail Prices

Specification

$$P_{itj} = \beta_0 + \beta_1 RFC_{it} + \beta_2 HYDRO_{it} + \beta_3 NUCLEAR_{it} + \quad (1)$$

$$\beta_4 RYield_t + \beta_5 SIZE_{it} + \beta_6 PURPA_{itg} + \beta_7 EWG_{it} +$$

$$\beta_8 RETAIL_{it} + \mu_i + \nu_t + \varepsilon_{it}$$

where:

i indexes states
t indexes years
j is either the residential price (r) or the industrial price (i)
μ_i is a state specific error
ν_t is a time specific error
ε_{it} is an iid random error

Figure 1:

Variables

and the variables are defined as:

P:	average retail residential or industrial price.
RFC:	average real fossil fuel price per kWh of total electricity supplied in each state over time.
RYield:	Real yield on electric utility debt over time.
HYDRO:	share of total electricity supplied coming from hydroelectric generation in each state over time.
NUCLEAR:	share of total electricity generation coming from nuclear plants in each state over time.
PURPA:	share of total electricity generation coming from PURPA qualifying facilities (QF) in each state beginning with 1985.
EWG:	share of electricity generated by unregulated generators in each state beginning in 1998.
RETAIL:	a dummy variable indicating whether or not a state had introduced retail competition in a particular year — beginning in 1998.

Figure 2:

Residential

Table 7. Residential Price Equations 1970-2003
(standard errors in parenthesis)

Variable	GLS	Fixed-effects	Fixed-effects plus time trend
RFC	0.51 (0.019)	0.51 (0.019)	0.48 (0.019)
HYDRO	-0.20 (0.077)	-0.16 (0.095)	-0.36 (0.099)
NUCLEAR	0.39 (0.054)	0.38 (0.056)	0.45 (0.056)
YIELD	0.042 (0.002)	0.043 (0.002)	0.047 (0.002)
SIZE	-0.13 (0.0044)	-0.13 (0.0048)	-0.11 (0.0063)
PURPA	0.43 (0.078)	0.42 (0.079)	0.61 (0.084)
EWG	-0.24 (0.058)	-0.23 (0.058)	-0.23 (0.057)
RETAIL	-0.24 (0.042)	-0.25 (0.042)	-0.21 (0.042)
R^2 (corrected)	0.74	0.61	0.62

Source: See text and appendix.

Figure 3:

Residential

Table 8. Residential Price Equations 1981-2003
(standard errors in parenthesis)

Variable	GLS	Fixed-effects	Fixed-effects plus time trend
RFC	0.24 (0.031)	0.19 (0.032)	0.048 (0.029)
HYDRO	-0.064 (0.11)	0.125 (0.153)	-0.36 (0.137)
NUCLEAR	0.21 (0.071)	0.136 (0.073)	0.082 (0.056)
YIELD	0.06 (0.0046)	0.056 (0.0047)	0.027 (0.004)
SIZE	-0.18 (0.0077)	-0.21 (0.0088)	-0.1 (0.0089)
PURPA	0.22 (0.09)	0.122 (0.092)	0.288 (0.082)
EWG	-0.19 (0.054)	-0.16 (0.054)	-0.16 (0.048)
RETAIL	-0.24 (0.039)	-0.25 (0.038)	-0.126 (0.034)
R^2(corrected)	0.66	0.73	0.79

Source: See text and appendix.

Industrial

Table 9. Industrial Price Equations 1970-2003
(standard errors in parenthesis)

Variable	GLS	Fixed-effects	Fixed-effects plus time trend
RFC	0.74	0.73	0.68
	(0.019)	(0.02)	(0.019)
HYDRO	-0.264	-0.13	-0.535
	(0.078)	(0.10)	(0.10)
NUCLEAR	0.20	0.22	0.42
	(0.071)	(0.055)	(0.056)
YIELD	0.034	0.034	0.043
	(0.0054)	(0.002)	(0.002)
SIZE	-0.4	-0.4	-0.3
	(0.034)	(0.035)	(0.03)
PURPA	0.41	0.38	0.69
	(0.08)	(0.081)	(0.083)
EWG	-0.26	-0.24	-0.22
	(0.059)	(0.059)	(0.057)
RETAIL	-0.16	-0.17	-0.12
	(0.043)	(0.043)	(0.042)
R^2 (corrected)	0.62	0.60	0.64

Industrial

Table 10. Industrial Price Equations 1981-2003
(standard errors in parenthesis)

Variable	GLS	Fixed-effects	Fixed-effects plus time trend
RFC	0.53	0.48	0.23
	(0.03)	(0.031)	(0.026)
HYDRO	-0.40	-0.29	-0.62
	(0.10)	(0.15)	(0.12)
NUCLEAR	0.11	0.056	0.029
	(0.071)	(0.075)	(0.057)
YIELD	0.078	0.079	0.029
	(0.0045)	(0.004)	(0.004)
SIZE	-0.4	-0.4	-0.3
	(0.04)	(0.04)	(0.03)
PURPA	0.24	0.10	0.18
	(0.09)	(0.09)	(0.072)
EWG	-0.24	-0.23	-0.15
	(0.054)	(0.055)	(0.042)
RETAIL	-0.18	-0.20	-0.043
	(0.039)	(0.039)	(0.03)
R^2 (corrected)	0.61	0.68	0.82