

Interaction Between The Legislative And Regulatory Process: The Case Of State Level Electricity Restructuring

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Abstract

For several years beginning in the early '90s, states attempted to bring competition and the resulting lower cost to the provision of electric power within the states through restructuring. This paper attempts to model the behavior of legislatures in reaction to the decisions of regulators as well as their own institutional incentives using a panel dataset of the 48 states across the 8 years in which restructuring was occurring

Keywords

Electricity, Regulation, Electricity Restructuring, Competition, Electricity Deregulation, Legislatures, Regulators

Introduction

The electric power industry in the United States underwent significant structural change in the 1990s because of one hundred years of relatively high cost state and federal regulation. Did restructuring in the form of the deregulation of wholesale generation markets result in a decline in cost per kilowatt-hour (kWh) to customers? We do not know, but present a framework for investigating the problem.

Related to the cost to firms is the role of regulators within states in creating and determining the conditions that led to restructuring. Through the regulatory period evidence exists that state regulators acted on behalf of consumers in limiting prices firms charged consumers. Regulation prevented the exercise of monopoly pricing power. But further evidence shows regulators granted significant rents to utilities in exchange for stable output and prices. With the enactment of restructuring legislation, legislatures focused attention away from maintaining stability and elected to allow for the competitive production of power with coordination to promote competition and limit disruptions.

The political process within the regulatory agency is an important consideration in determining whether states restructured. A political as well as economic decision occurs when the level of cost allowed to pass-through to customers, and the rate of return to the firm, is determined by regulators in the states. While regulators operate as agents of the legislature, their incentives differ.

Using average revenue as a proxy for price, our model simultaneously estimates restructuring as a function of a legislature's structure, expected savings from restructuring, fuel costs, and the structure and incentives of the regulating agency.

The Model

Economic theory says that legislators base their decisions on the perceived net benefit of, or demand for, a particular proposal. Our model proposes that legislative outcomes derive from perceived net benefits of legislative decision making:

$$L_{it}^* = f(Z_i, \Psi_{it}, E_i(P_L - P_{NL})) \quad (1)$$

The Z_i represent state specific exogenous legislature characteristics that do not vary by year. The Ψ_{it} represent state specific characteristics that do vary by year, and $E_i(P_L - P_{NL})$ is the expected difference in price between restructuring (L) and not restructuring (NL) for the state in a specific year.

The expected difference in electricity price is a function of the expected price differences between states that restructure and those that do not:

$$E_i(P) = g(X_i, C_{it}) \quad (2)$$

The expected price, $E_i(P)$ is a function of state specific, time invariant regulatory commission characteristics, X_i , derived from the literature on regulatory structure and decision-making, and a state specific, time varying cost per btu, C_{it} , of generation fuel sources.

Sass and Leigh (1991) develop a switching regression model that predicts a difference in motorcycle fatalities between states that passed a motorcycle helmet law, and those that did not. Their paper assumes that an endogeneity issue exists in which states that choose to have motorcycle helmet laws do so knowing the existence of a law affects fatalities. We do the same, assuming the existence of restructuring legislation affects the price per kWh of electricity after passage. Our assumption is that the existence of a law is what matters, rather than the passage. Sass and Leigh's method is useful if we assume performance under the law is important.

The econometric specification assumes endogenous legislative decisions and electricity prices are linear functions of the structure of legislatures and regulatory agencies respectively. We begin by estimating a probit decision model:

$$L_{it} = Z_{it}\xi + u_{oit} \text{ where the observed outcome } L_{it} = \begin{cases} 1 & \text{if } L_{it}^* \geq 0 \\ 0 & \text{if } L_{it}^* < 0 \end{cases} \quad (3)$$

where L_{it}^* is the net benefit of restructuring legislation in state i and year t . Z_{it} is a vector of observed state variables and u_{oit} is an error term. The expected price of electricity is modeled in reduced form as follows:

$$E(P) = (\alpha_L - \alpha_{NL})\Phi + (\beta_L - \beta_{NL})X\Phi + \alpha_{NL} + \beta_{NL}X + (\sigma_{NL\mu} - \sigma_{L\mu})\varphi \quad (4)$$

The α_L and α_{NL} represent constants, β_L and β_{NL} are vectors of slope coefficients, X is a vector of exogenous variables, and the subscripts L and NL represent states that enacted restructuring legislation (L) and those that did not (NL) in the 8 years represented by the data. The Φ and φ terms are the standard normal cumulative distribution and density functions evaluated at $Z_{it}\xi$. Φ is $Pr(L = 1)$, while $1 - \Phi$ is $Pr(L = 0)$. The first two terms, $(\alpha_L - \alpha_{NL})\Phi$ and $(\beta_L - \beta_{NL})X\Phi$, represent the expected difference in price with the random assignment of restructuring; the final term, $(\sigma_{NL\mu} - \sigma_{L\mu})\varphi$, is a measure of the bias caused by non-random selection.

The expected price with restructuring legislation (P_L) and with no legislation (P_{NL}) can now be estimated.

$$P_L = \alpha_L + \beta_L X$$

$$P_{NL} = \alpha_{NL} + \beta_{NL} X$$

One would expect that the difference in price across states would have some effect on whether a state

restructured or not. Following Sass and Leigh, the structural equation is specified:

$$L_{it} = Z_{it}\xi + \delta(P_L - P_{NL}) + u_{oit} \quad (5)$$

where P_L and P_{NL} represent price in states with restructuring legislation and price in states without restructuring legislation. Combining equations (4) and (5), the final reduced form equation is:

$$L_{it} = Z_{it}\xi + \delta((\alpha_L + \beta_L X) - (\alpha_{NL} + \beta_{NL} X)) + \delta(u_{Lit} - u_{NLit}) + u_{oit} \quad (6)$$

To obtain a result, estimate (6) using probit estimation and obtain the values of Φ and φ . Substitute those results into equation (4) and estimate by ordinary least squares, incorporating φ to adjust the covariance. The predicted difference in prices obtained in (4) is used as an explanatory variable in the estimation of (5) by directly predicting expected average revenue in the law and no law regimes. Additionally we must be careful to restrict the coefficients in the estimation procedure. The δ term changes if the coefficients are not restricted so that $\frac{\tilde{\alpha}}{\alpha_L - \alpha_{NL}} = \frac{\tilde{\beta}}{\beta_L - \beta_{NL}}$ where $\tilde{\alpha} = f[\delta(\alpha_L - \alpha_{NL})]$ and $\tilde{\beta} = g[\delta(\beta_L - \beta_{NL})]$. We account for this in our estimation.

The Explanatory Variables

Contributions to the literature have focused on the economic analysis of legislature production. Crain (1979) develops a model that treats the legislature as a firm. Crain also identifies some variables of interest in our analysis and finds some support for structure as an explanation of the legislative firm's output. Tollison (1988) is a survey of the role of Public Choice in the analysis of legislation. It serves as a compendium of the rich literature that had developed through the late eighties. Most recently, Sobel and Ryan (2011) have looked at legislator tenure and the production of legislation, finding that the committee structure of Congress and the seniority system reduces output and increases the cost of legislation to special interests.

Shughart and Tollison (1985) suggest that the legislative process can be modeled in terms of supply and demand. On the demand side the percentage of customers by class was important in determining legislative events. Industrial, commercial, transportation, and other customers are grouped together in the model. Industrial customers are intense users of electricity and they represent a concentrated interest group. Commercial customers fall in the middle. While the cost of electricity is a potentially substantial portion of commercial customer's budgets, they are a large and diffuse group. We assume their interests are more closely aligned with industrial consumers. At the other extreme are residential customers whose interests are the most diffuse and electricity makes up a relatively small portion of their overall budgets.

Theories of regulation suggest coalitions of winners and losers may influence changes in regulation

(Stigler, 1971) (Posner, 1974) (Peltzman, 1976) (Becker, 1983). While industrial and commercial customers are obvious beneficiaries and are a potentially concentrated coalition, residential customers and other special interests can exert different lobbying pressure through consumer advocates. In addition utilities—most importantly the Investor Owned Utilities (IOUs) — have a significant interest in the structure of legislation.

The supply of legislation and regulation can be explained by the structure of the state legislatures and regulatory agencies. Shughart and Tollison (1985) and Crain (1979) note that for a given legislature's size, the ratio of the house to the senate will give an indication of the relative power of lobbying within the state legislature. The greater the ratio, the less likely a given law will pass within a legislature. Assuming that the cost of influencing votes increases at an increasing rate as McCormick and Tollison (1981) suggests, the cost of influence is greater the more disparate the size of the legislative houses. The cost of a vote in the larger house is greater than the savings from losing the vote in the smaller house, making influencing both houses jointly more costly. Shughart and Tollison also notes that the legislature's size can affect the chances that legislation will pass. The larger the legislature, the less likely legislation will pass because it is more difficult for legislators to come to a consensus. On the other hand, the value of a legislator's vote is less in large legislatures. This makes monitoring legislators relatively easy for interest groups and lessens the cost of votes through competition among legislators. The length of the legislative session is another indicator of the probability that legislation will be enacted. The longer the legislative session, the more likely legislation will be passed. There is simply more time to pass legislation.

Sass and Leigh note intransigence in the law. A lagged binary variable accommodates this effect. When a law exists, it is more likely that the law will stay in effect in the next year since no action is necessary to have the law in the next period. Conversely, when a law does not exist there is a tendency for the status quo to be maintained. All legislation is costly to enact in some way. A +1 variable signifies the existence of a law in the previous period; a -1 is assigned to the periods in which there was no law in the previous period. The lag effect is necessary in order to identify the α and β terms in the estimation. Using a simple dummy variable to identify restructuring versus non restructuring states makes the model impossible to estimate. There becomes no way to differentiate between restructuring and non-restructuring states. Of note, a movement to suspend restructuring in several states began in 2003. Because we use the lagged indicator for restructuring, the relevant restructuring period is 2002, before any state suspended restructuring activities.

Regulatory commissions in the regulated environment are responsible for the rate of return allowed for

utilities, especially IOUs. For this reason the structure and rules governing the regulatory commissions within the states should have an effect on the price of electricity within the states. In the model it is the structure of the regulatory commissions along with average fuel prices that determine average revenue per kWh of electricity.

Expect several factors within the commissions to affect regulatory decisions. The staggering of commissioner's terms is one instance. Salant (1995) argues that the staggering of term of office of regulatory commissioners and term of employment of the management of IOUs can have an effect on the allowed rate of return to IOUs. Commissioners in the last part of their terms have no incentive to allow IOUs to collect on investments in infrastructure because they will not be present to reap the benefits from increases in system reliability that come with those investments. Likewise, the management within the IOUs does not have an incentive to invest in infrastructure in the last part of their terms because they will not collect on the benefits. Salant's analysis finds that the staggering of terms between the managers of firms and regulators will lead to optimal investments in new capacity, given finite horizons. His conclusions suggest that commissions with staggered terms for commissioners will tend to allow for higher returns to investments by IOUs. The staggering of terms of commissioners is used because manager data is difficult to obtain. Because the terms of commissioners are staggered, it is more likely that the terms will be staggered relative to managers of IOUs. Higher returns to IOUs translate into higher rates for customers.

Many commissions have restrictions on employment after commission members leave office to thwart commissioners favoring IOUs in rate cases and other regulatory hearings. Salant suggests the contrary—the opportunity for post-commission employment in the private sector could be socially beneficial, leading to more optimal regulatory outcomes. Commissioners with a potential stake in the health of IOUs are more likely to allow for higher rates of return than commissioners who are indifferent.

Addressing potential corruption of the regulator/IOU relationship, Salant notes that the media, public interests groups, and lobbyists heavily monitor the regulatory process, thereby decreasing the potential for corruption. The larger the commission, the less opportunity there is for corruption and the lower the expected electricity rates. Also the larger the commission, the less likely a consensus on the level of rates and the more likely commissions will agree on low rates.

The length of the term of office has the effect of reinforcing the tenure of the commissioners. With longer commission terms, the more likely commissioners are to act in their own interests, at the expense of the public. Longer terms also increase the likelihood of corruption. Assume the longer the

term, the higher the price.

Whether or not the commission members are elected may have an effect on their performance in office. Besley and Coate (2003) suggest elected regulators are more pro-consumer than appointed regulators. It points out that political parties are more likely to choose regulators that are pro-stakeholder in the regulatory preferences, as opposed to pro-consumer. Pro-stakeholder candidates are more likely to use resources in a way favorable to the gubernatorial candidate than pro-consumer candidates. By being pro-consumer, expect elected candidates to be less likely to allow for rate increases than pro-stakeholder candidates. Besley and Coate implies that a pro-consumer regulator will be less effective when firms can affect the future employment of regulators in the regulated industries in states with fewer constraints on post-commission employment. Mixon (2001) finds that states with appointed regulators tend to have larger commissions than states with elected regulators. This is consistent with elected commissions having incentives more closely aligned with consumer preferences as opposed to appointed commissions whose preferences are more closely aligned with those of the party in power.

The qualifications of commissioners can affect the regulatory outcome. Expect commissioners with a professional background to be better informed or qualified to determine what rates utilities should be allowed to pass on. On the other hand, professionals may be less likely to be pro-consumer, even if elected, given their qualifications—the hubris of office.

Minority party representation on a commission is expected to counter tendencies towards regulatory capture. Savitski (2001) looked specifically at the initiation of regulation, noting that Republican state administrations were less likely to initiate state regulation of utilities. Expect Republican appointed commissions to favor IOUs. Appointment of Democratic regulators would thwart pro-industry regulation. A Democratically controlled commission would lean toward more pro-consumer regulation. This tendency could be countered by a Republican on a regulatory commission.

Data

Using data culled from the Energy Information Agency (EIA), the Federal Energy Regulatory Commission (FERC), the National Association of Regulatory Utility Commissioners (NARUC), and Council of State Governments (CSG)—a dataset was assembled with information about legislatures, regulatory commissions, state-level aggregate variables, and cost per Btu for the 50 states and the District of Columbia for 8 years beginning in 1996 and ending in 2003. The District of Columbia was later removed from the set because of data irregularities. Nebraska was removed because its unicameral

legislature and a state government monopoly in the industry made it an inconvenient outlier. New Hampshire was removed because its legislative structure made it an extreme outlier. Idaho was removed because of a lack of cost data and to make the estimation results less unstable. Table 1 is a summary of the variables used in the estimation, including the omitted states and the District of Columbia.

Table 1: Summary Statistics

Variable	Mean	Standard Deviation	Min	Max
Legislation Enacted?	0.34	–	0.00	1.00
Session Length	58.49	52.70	0.00	210.00
House to Senate Ratio	2.92	2.15	1.00	16.67
Legislature Size	147.64	59.65	49.00	424.00
% Industrial Customers	0.01	0.00	0.00	0.03
% Commercial Customers	0.12	0.02	0.08	0.19
% Residential Customers	0.87	0.02	0.80	0.91
Number of Utilities	25.32	38.49	0.00	184.00
Avg Revenue per kWh All Sectors	7.00	2.13	3.90	14.47
Avg Revenue per kWh Industrial	5.11	1.83	2.74	12.20
Avg Revenue per kWh Commercial	7.33	2.05	4.17	15.02
Avg Revenue per kWh Residential	8.48	2.31	4.95	16.73
Number of Commissioners	3.92	1.22	3.00	7.00
Term of Office	5.42	0.94	4.00	8.00
Elected?	0.24	–	0.00	1.00
Minority Party Represented?	0.48	–	0.00	1.00
No Post-Employment Restrictions?	0.32	–	0.00	1.00
Qualifications Required?	0.58	–	0.00	1.00
Staggered Terms?	0.94	–	0.00	1.00
Strongly Democrat	0.13	–	0.00	1.00
Strongly Republican	0.20	–	0.00	1.00
Weakly Democrat	0.14	–	0.00	1.00
Weakly Republican	0.24	–	0.00	1.00
Politically Neutral	0.28	–	0.00	1.00
Cost per Btu	0.11	0.11	0.00	0.70

In the estimation, average revenue across all sectors was used as the dependent variable. Average revenue is used because there is a substantial amount of price discrimination in electricity pricing, choosing any particular price or even average price could introduce bias. Total revenue and production are reported in the EIA data. It is expedient to use average revenue and it is standard practice in the field.

Fuel cost is measured in dollars per Btu. Across the states they range from 0 in Idaho to \$0.70 per Btu, almost 7 times the mean. The year 2003 was a problem because cost per Btu was not reported in the EIA data after 2002. Several states had missing data for other years. The mean value prior to 2003 of non-missing years was imputed into the missing values for each state. Idaho was initially assigned 0 for every year on the assumption that most of its power needs were met by hydroelectric production, but Idaho was later excluded.

The legislative data in the analysis is for 2003. It is assumed that the structure of legislatures does not

change significantly from 1996 to 2003. Legislative sessions averaged 59 days with a maximum of 210. Some states alternated legislative session length year to year, having longer and shorter session in odd and even years. Some states had no statutory session length. The effect for states without statutory session length for a given year is captured in a dummy for no session length. The House to Senate ratio ranges from 1 to about 17. The 1 is for Nebraska, which has a unicameral legislature. The 17 corresponds to New Hampshire, which has an extremely large House of Representatives relative to the Senate. When measuring the effects of House to Senate ratio on legislative outcomes, it is important to control for the absolute size of the legislature. The legislature's size is the sum of the House and the Senate in each state. The largest legislature is New Hampshire's with 424 legislators. The smallest is Nebraska's with 49.

The regulatory variables are from the year 1996 as published in the NARUC yearbook. Most of the regulatory variables are recorded as a binary variable representing whether states had elected regulators, whether the position required professional qualifications, if the minority party is represented, if there are any post-employment constraints on regulators, the number of commissioners, the length of the regulatory term of office, and whether there are staggered terms for commissioners.

Results

Table 2 shows the estimates of the probit regressions of legislative outcome as a function of state legislative variables with (column *a*) and without (column *b*) the expected difference in price ($AR_{law} - AR_{no\ law}$). The regressions are estimated using restricted coefficients method explained above. Regression (1) represents the estimated model ignoring all potential mitigating factors aside from state legislature structure. We find no significant result from legislature structure other than the effect of legislature size. The larger the legislature, the more likely legislation will be passed, contradicting Shughart and Tollison's result to some extent. But it could suggest that lobbying activity and consensus in favor of restructuring offsets the difficulty in getting legislation through the legislature. The most promising result finds the percentage of industrial and commercial customers together has a negative effect on the legislative outcome suggesting they, as a class, benefit from the incumbent regulation. Most importantly, the addition of expected difference in price has no clear effect on the most basic estimate of restructuring legislation.

Regression (2) in Table 2 is the same estimate as regression (1) with the added effect of restructuring in adjacent states and an interaction term for adjacent state restructuring and fuel cost (*Adj Rest and Cost/Btu*) to control for regional differences in restructuring. The proportion of industrial and commercial customers is still significant, although the effect of legislature size is no longer significant. The effect of

adjacent states restructuring is significant at the 5% level and positive as one would expect.

Table 2: Results from the Regression of Legislative Outcome on State Parameters

	Predicted Sign	(1)		(2)	
		a	b	a	b
Session Length	+	0.003 (1.08)	0.003 (1.20)	0.002 (0.77)	0.002 (0.85)
No Session Length	+	-0.105 (0.33)	-0.035 (0.11)	-0.182 (0.53)	-0.135 (0.38)
House to Senate Size Ratio	-	0.213 (1.13)	0.168 (0.86)	0.321 (1.66)	0.285 (1.43)
Legislature Size	?	0.008 (2.42)*	0.008 (2.51)*	0.006 (1.75)	0.006 (1.85)
% of Industrial and Commercial Customers	?	-23.678 (3.57)**	-23.605 (3.57)**	-20.847 (3.22)**	-20.687 (3.19)**
Number of Utilities in 1995	?	-0.005 (1.32)	-0.005 (1.36)	-0.006 (1.41)	-0.006 (1.40)
$AR_{law} - AR_{no\ law}$	-		34.630 (0.74)		-29.753 (0.71)
Adjacent Restructured	+			1.044 (2.53)*	0.980 (2.31)*
Adj Rest and Cost/Btu	+			0.108 (0.88)	0.078 (0.61)
Constant		3.406 (3.95)**	3.038 (3.08)**	2.569 (2.93)**	2.163 (2.07)*
N		384	384	384	384

* $p < 0.05$; ** $p < 0.01$

If legislative outcomes for restructuring are dependent on the structure of legislatures as in the Sass and Leigh econometric framework, there is little direct evidence found with respect to electricity restructuring. There is significant evidence that the proportion of industrial and commercial customers together has an effect on the passage of restructuring, but this could also be interpreted as the proportion of residential customers having a positive effect on the passage of restructuring legislation. This would be in spite of the relatively diffuse effects restructuring would have on individual residential customers, or an acknowledgment of the effect of consumer advocates in the states that have proportionally more residential customers.

Table 3 presents regression (3) and regression (4), the Sass and Leigh specification controlling for the ideological composition of the legislature. The ideological composition is assumed to be strongly associated with the party in control of the state house, senate, and governorship. To be “Strongly Democrat” is to have the house, senate, and governorship controlled by Democrats; likewise “Strongly Republican” is for republican control. Another way for a state to be classified as strongly party affiliated is for the house and senate to be controlled by the same party, while the governorship is controlled by an independent. States are classified as weakly party affiliated when the governor’s party is in control of one half of the legislature, but not the other. Finally the state is considered neutral if the governor’s party is of a different party than both the house and the senate, or there is a tie in control of one of the two bodies.

Table 3: Results from the Regression of Legislative Outcome on State Parameters Continued

	Predicted	(3)		(4)	
	Sign	a	b	a	b
Session Length	+	0.003 (0.91)	0.003 (1.13)	0.002 (0.59)	0.002 (0.73)
No Session Length	+	-0.099 (0.30)	0.023 (0.07)	-0.175 (0.48)	-0.078 (0.21)
House to Senate Size Ratio	-	0.267 (1.37)	0.197 (0.98)	0.376 (1.87)	0.317 (1.54)
Legislature Size	?	0.007 (2.12)*	0.008 (2.27)*	0.005 (1.52)	0.006 (1.68)
% of Industrial and Commercial Customers	?	-23.485 (3.48)**	-23.488 (3.49)**	-21.067 (3.16)**	-21.036 (3.17)**
Number of Utilities in 1995	?	-0.005 (1.24)	-0.005 (1.29)	-0.005 (1.29)	-0.005 (1.26)
Strongly Democratic	?	0.345 (0.97)	0.377 (1.05)	0.370 (0.96)	0.358 (0.92)
Strongly Republican	?	0.306 (1.00)	0.369 (1.18)	0.303 (0.92)	0.347 (1.04)
Weakly Democratic	?	-0.300 (0.71)	-0.358 (0.86)	-0.212 (0.47)	-0.314 (0.68)
Weakly Republican	?	0.197 (0.65)	0.188 (0.62)	0.299 (0.91)	0.270 (0.82)
$AR_{law} - AR_{no\ law}$	-		2,540.267 (1.13)		-12.579 (1.03)
Adjacent Restructured	+			1.076 (2.51)*	0.964 (2.18)*
Adj Rest and Cost/Btu	+			0.123 (0.95)	0.074 (0.54)
Constant		3.254 (3.68)**	2.651 (2.61)**	2.441 (2.69)**	1.831 (1.71)
N		384	384	384	384

* $p < 0.05$; ** $p < 0.01$

With respect to Table 3, regression (3) and (4) do not markedly differ from regressions (1) and (2). Legislature size has a similar effect as does the percentage of industrial and commercial customers. The coefficient on the difference in average revenue is extraordinarily large. Repeated attempts to get a handle on the cause resulted in ad hoc measures, such as removing Idaho from the data, and adding or removing insignificant variables, such as neutral party control. Leaving in neutral party control solves the problem, but collinearity of the party control variables is pushed. It was not unique to regression (3), as it occurred in a specification of regression (2), making its inclusion a lesson in the potential pitfalls of using differences in similarly defined and estimated variables as controls in models. It is also a lesson in the importance of including spatial effects when explaining trends in the passage of legislation across the states.

The results of the regression of average revenue across all sectors on the cost per Btu and the regulatory variables for the law and no-law states is summarized in Table 4. The φ term compensates for the bias introduced by the correlation of the error terms in the law and no-law cases with the iid error term. To not take this step would cause the difference in average revenue between the law and no-law cases to be biased.

Table 4: Estimated Coefficients of Variables in Average Revenue Regressions

	Sign	(1)	(2)	(3)	(4)
Φ		0.000 (0.67)	-0.000 (1.43)	0.000 (0.13)	-0.001 (1.08)
Staggered Terms for Commissioners	+	-0.188 (3.10)**	-0.176 (3.06)**	-0.198 (3.26)**	-0.174 (3.00)**
Number of Commissioners	+	0.018 (1.62)	0.022 (2.18)*	0.017 (1.40)	0.024 (2.27)*
Length of Commissioners' Terms	+	0.047 (3.20)**	0.044 (3.11)**	0.050 (3.36)**	0.043 (2.99)**
Requires Qualifications	-	-0.033 (1.31)	-0.010 (0.31)	-0.037 (1.49)	-0.018 (0.59)
Minority Party Represented	-	-0.095 (3.23)**	-0.099 (3.36)**	-0.097 (3.28)**	-0.098 (3.33)**
Post-Employment Constraints	+	-0.059 (1.73)	-0.066 (2.13)*	-0.051 (1.51)	-0.063 (2.02)*
Elected Commissioners	-	-0.207 (5.50)**	-0.198 (5.26)**	-0.209 (5.55)**	-0.199 (5.29)**
$\ln(\text{cost/Btu})$	+	0.024 (2.05)*	0.021 (2.02)*	0.020 (1.80)	0.020 (1.89)
φ		-0.049 (0.37)	-0.096 (0.83)	-0.016 (0.13)	-0.075 (0.67)
Constant		2.010 (18.28)**	1.973 (20.09)**	1.967 (18.55)**	1.955 (19.90)**
N		384	384	384	384

* $p < 0.05$; ** $p < 0.01$

The differences in results (1) through (4) in Table 4 is a result of which specification is used to estimate models (1) through (4) in Table 2 and Table 3. There appears to be no significant difference between the specifications. The coefficients on everything but the φ term are used to calculate the expected difference in average revenue in the law and no-law regimes for models (1) through (4) in Tables 2 and 3.

With respect to the regulatory determination of average revenue in electricity across states, cost per Btu of energy is the most obvious candidate for determining average revenue, except for specifications (3) and (4) which were of similar magnitude, but statistically insignificant. It suggests that adjacent restructuring helps in explaining some of the restructuring in the states. In addition; term length, minority party representation, and election of commissioners are of the expected sign and statistically significant in all specifications. The coefficient for the staggering of terms for commissioners is the wrong sign and statistically significant in all specifications. This is likely due to Mississippi and South Carolina driving this result. The same problem occurs with the variable for post-employment restrictions, but it is only statistically significant in specifications (2) and (4). The number of commissioners is also significant in specifications (2) and (4), but with the correct sign. Both results suggest controlling for adjacent restructuring helps explain some of the variation in restructuring that confounds our controlling for post-employment constraints and number of commissioners. The qualification requirement is the only variable that is insignificant in all specifications.

The b columns in Tables 2 and 3 are the specifications including the effect of the expected difference in

average revenue in the states passing restructuring legislation and average revenue in the states that did not pass restructuring legislation ($AR_{law} - AR_{no\ law}$). Specifications (2) and (4) include a control for whether an adjacent state restructured. Although the difference is statistically insignificant in all specifications, (2) and (4) are at least of the expected sign, suggesting (1) and (3) are misspecified by the omission of the effect of restructuring in adjacent states. The negative coefficient on the difference in average revenue in all specifications indicates that the greater the difference in expected price between the law and no-law cases, the more likely the legislation is going to be adopted. The assumption of legislators is to expect the no-law price to be greater than the price with the law, and hence their difference to converge or be negative.

Table 5: Estimated Mean Difference in Average Revenue from Restructuring

	(1)	(2)	(3)	(4)
$AR_{law} - AR_{no\ law}$	0.010 (0.000)**	-0.013 (0.000)**	0.000 (0.000)**	-0.047 (0.001)**
N	384	384	384	384

Table 5 is the mean difference in average revenue from restructuring. Based on the hypothesis that there is a significant difference in average revenue between the states that passed restructuring legislation and those that did not, there is between 13 and 47 cent difference in average revenue per megawatt-hour (MWh, 1 MWh=1000 kWh) between states that did not restructure versus those that did. The sign on specifications (2) and (4) is consistent with the assumption that the no-law price exceeds price with the passage of legislation.

Conclusion

The model presented makes an argument for the simultaneous determination of legislative outcomes using electricity markets. Because neither legislators nor regulators work in a vacuum expect that legislators react to the regulators' decisions, as elicited in their effect on price, in the legislature's decision to pass restructuring, especially given the exogenous determination of input costs and regulatory structure by state.

The legislatures' structure has few strong results. Session length is significant when we do not account for restructuring in an adjacent state, but statistically insignificant otherwise. The result is consistent with the theory of the effect of session length on the adoption of laws, at least if we are not controlling for adjacent state restructuring. The big result from the legislative side is the concentration of industrial and commercial customers and restructuring in adjacent states. Unfortunately the other legislative

variables show little evidence that legislature structure has an effect on the passage of restructuring.

Ideology also has little effect on the passage of restructuring legislation. In all cases, there is minimal evidence that ideology drives legislative outcome. Unfortunately it cannot be shown that legislators are reacting to expected prices as their signal. But it is likely that legislators do observe some other aspects of the regulatory process and react accordingly.

The results for the effect of commissions on the price of electricity in the states are more promising. All specifications suggest that commission structure has an effect on price. Most importantly, specifications (2) and (4) imply that including a control for restructuring in an adjacent state explains some variation to the extent the number of commissioners and post-employment constraints have the expected sign. Unfortunately political ideology confounds cost as an explanation of price in specifications (3) and (4).

Finally, while we report mean difference in average revenue for all specifications, we are most confident in the estimates that include a control for adjacent state restructuring, the estimated difference being between 13 and 47 cents per MWh.

While it cannot be determined that legislators are reacting to expected differences in price when determining their votes on restructuring legislation, there is evidence that either the size of legislatures or adjacent state restructuring and market structure in the form of industrial and commercial customer concentrations had an effect on restructuring legislation in the states.

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