Does Deregulation Raise Electric Rates? A Cross Sectional Analysis

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Introduction

The theory behind deregulation is that competition would be salutary and would create greater efficiencies and reduce costs. A number of economists and a larger number of deregulation proponents have advanced this view. (See for example out of a much larger set of references, Fabrizio et al, 2004 for an academic view; Sutherland, 2003 for an academic analysis on behalf of market participants; Johnston and Kiesling, 2011 from a conservative think tank; and Constellation Energy, 2011 for the view from an industry participant). A consulting firm that promotes retail energy markets provides some succinct comments in defense of this view cited below:

> States that have opened their electricity markets to retail competition have seen a surge in consumer-driven product and service innovation compared with states where electricity remains a commodity delivered by monopoly providers. (Distributed Energy Financial Group 2011a)
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> The promise of retail electricity competition is lower energy costs, a greater variety of products and services, and the benefits of innovation. (Distributed Energy Financial Group, 2011, page 1)
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> Residential consumers are benefitting from customer choice in several areas and are poised to reap additional benefits as new technologies are adopted. Smart grid infrastructure investments—including advanced metering, communications and control devices, and usage displays—allow entrepreneurial retail energy suppliers to develop new pricing and service choices and to take advantage of emerging telecommunications markets for choices in new billing and information transactions. Consumers have access to more choices, more information, and better ways to control their energy usage and electric costs. Consumers see increased convenience and determine the best way to increase value in their lives. (Distributed Energy Financial Group, 2011, page 2)

However, a large number of reasons can be identified as to why costs have not necessarily gone down as originally expected, including but not limited to markets' raising costs of generation to marginal cost; strategic bidding (the extremes of which were developed by Enron, as outlined in Woychik,2007 and McCullough 2002); costs of

hedging generation for sales to retail customers; and "de-integration" that reduces economies of scale and increases costs (Kwoka, 2006). De-integration cost increases arise from (1) separating generation from other utility activities, (2) shifting of transmission from state to federal jurisdiction and more generous regulation at FERC; (3) increased administrative costs arising from Regional Transmission Organizations (which duplicate utility functions); (4) costs of building and administering new computer systems for both utilities and RTOs to handle system requirements caused by deregulation (direct access billing requirements, load settlement, RTO bidding requirements, etc.). Finally, costs arise from separating retail services from wires in places with full competition (such as Alberta and Texas), including even assuring a rate of return for retail services in Alberta to create room for other competitors. (Alberta Utilities Commission, 2006)

Some places without full deregulation experience some deregulation costs. For example, in California, transmission costs have been placed under FERC since the late 1990s. As a result of deregulated wholesale markets, expensive new computer systems are being developed (Schilberg, 2011) and costly hedging requirements have been imposed. (Division of Ratepayer Advocates, 2011) Elsewhere in the country, affiliates of American Electric Power (AEP) have been trying to shift new transmission to more lucrative FERC regulation even in states where electricity is not deregulated. (Marcus, 2011, AEP, 2010)

Several observers from as disparate a set of organizations as public power supporters (Showalter, 2007, Johnston, 2007) and the libertarian Cato Institute (Van Doren and Taylor, 2004) have concluded that rates have increased as a result of deregulation.

This analysis provides an update of how the experience with deregulation has affected residential rates using later (2010) data from the Energy Information Administration. (EIA, 2011) It also adds a methodological enhancement, by controlling for regional factors and kWh sales per residential customer. After controlling for these factors, residential rates are 1.3 to 1.5 cents per kWh higher in deregulated states.

Texas: A Case Study

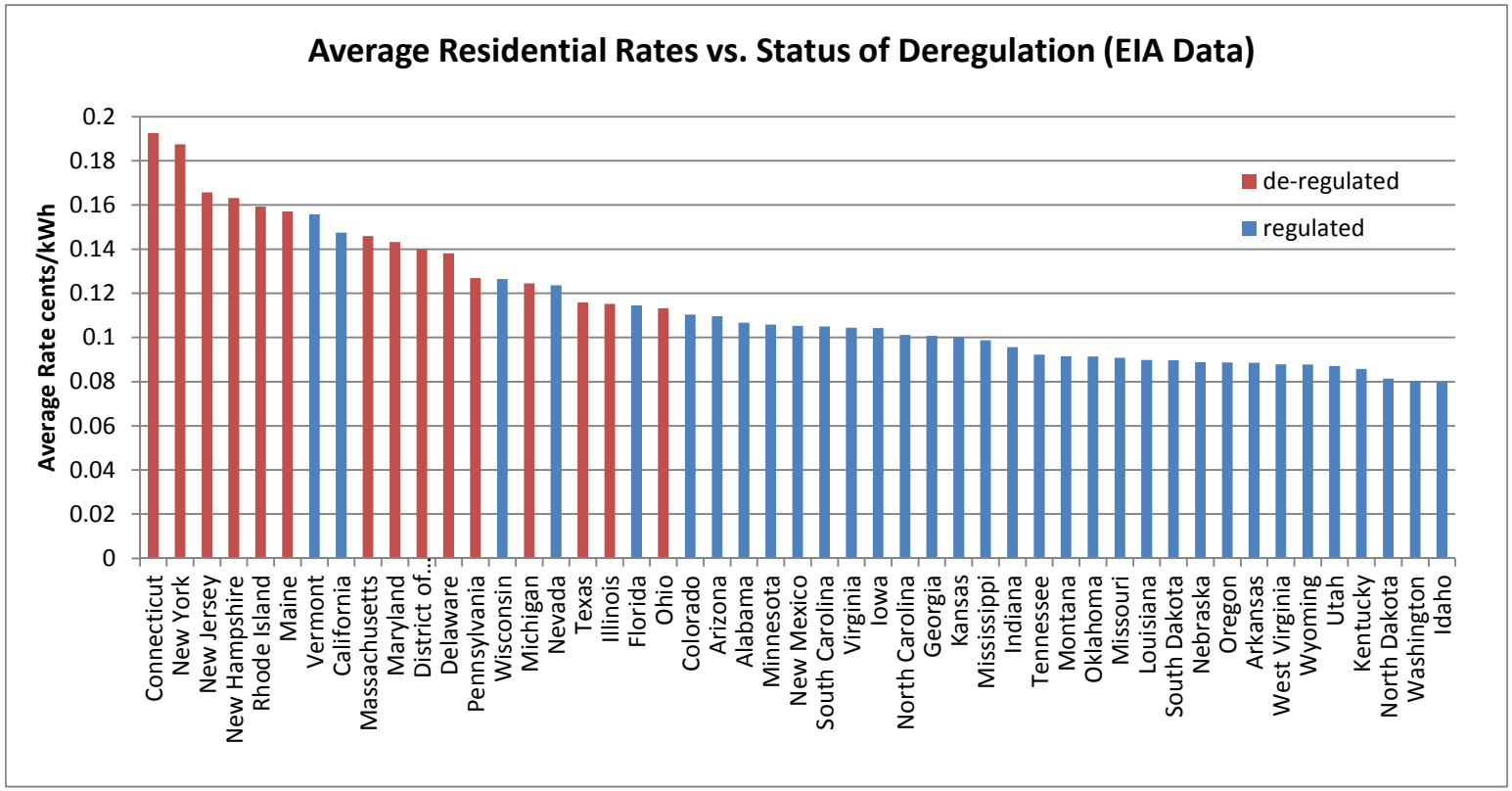
A recent MSNBC report referenced the five states with the highest and lowest residential electric bills. (Linn, 2011) The states with the lowest electric bills made sense – all in the

Mountain West with relatively low air conditioning use and low rates from old largely depreciated hydroelectric and coal generating plants using coal mined close to the powerplants that is thus relatively inexpensive (leaving aside environmental concerns). The states with the highest electric bills were Hawaii (an island which is one of the last places in the US where electricity is largely oil-fired), two eastern states, Maryland and Connecticut, both of which recently deregulated, and two southern states with high usage due to air conditioning loads and to electric utilities who compete with gas utilities to provide fuel for space heating and water heating: Alabama and Texas. Texas was the third deregulated state on the list, and its rate was higher while its use per customer was lower than Alabama.

So why did Texas end up on the list? To look at this question, we started with the raw data for 50 states plus the District of Columbia developed by the Energy Information Administration) that was the source of the MSNBC report. (EIA, 2011) Residential rates in Texas were the highest of the 13 southern states (South Atlantic except Delaware, Maryland, and District of Columbia; East South Central, and West South Central regions identified by EIA). The only one of the 13 that was close was Florida, which has limited transmission and some vestiges of oil-fired generation.

Texas has the 19th highest residential rates in the country. There are 15 deregulated jurisdictions out of the 49 in the continental U.S. (excluding remote and expensive Alaska and Hawaii); Twelve of the 18 states with higher rates also had deregulated. Only two of the 30 jurisdictions cheaper than Texas had deregulated. The average rate in states that did not deregulate was 10.05 cents/kWh. The average rate in states that were deregulated was 14.59 cents/kWh (41.1% higher). The result was highly statistically significant. Figure 1 shows the pattern by state. However, Figure 1 also shows that deregulated states are heavily concentrated in the high cost Northeast and Mid-Atlantic states and thus largely started out in higher cost jurisdictions to begin with. So was deregulation a response to high rates in many states rather than a cause of high rates?

Figure 1: Average Residential Rates and Status of Deregulation



Are There Additional Costs Associated with Deregulation?

To investigate the association of deregulation to high rates, we ran cross-sectional regressions of the EIA data for 49 jurisdictions (the 48 continental states plus the District fo Columbia, but excluding isolated and expensive Alaska and Hawaii). This cross-sectional technique has previously been used on EIA data by Mitchell *et al*. (2008) to analyze the relationship between electric usage and rates.

To disaggregate the effect of deregulation itself from other potential causes of high rates, two different analyses were performed.

The first method only examined 2010 cross-sectional data. Rates in a given state were a function of regional rates (thus capturing region-wide trends in fuel use and energy usage), kWh usage per residential customer relative to the region as a whole (lower usage associated with higher rates), and special binary or "dummy" variables for (1) whether the state was deemed to be deregulated according to EIA (EIA, 2010)[1]; (2) the four states in the Pacific Northwest with large amounts of cheap hydroelectric generation (Washington, Oregon, Idaho, and Montana), and (3) California, where an attempted deregulation program failed (while incurring many of the costs associated with deregulation – RTO, computer systems, etc.) and other causes also contributed to significantly higher rates than most states.

Before providing the results, it should be noted that the variable for kWh usage is ambiguous, although it clearly has predictive power in this equation. States with higher rates tend to see less usage due to price elasticity of demand (Mitchell *et al*., 2008). On the other hand, lower usage per customer (for whatever reason) could also mean fewer kilowatt-hours over which to spread the fixed costs of hooking up customers and paying for metering and billing costs, and thus higher rates per kWh. Regardless of the reason for the association between higher rates and lower kWh usage, it is an important explanatory variable that needs to be included when examining underlying cost

[1] We left out Oregon from EIA's list of deregulated states for residential customers, because Oregon has changed course and limited competition to large industrial customers. (Kelderman, 2005).

differences by state to determine whether there are any impacts of deregulation on rates and, if so, to tease those impacts out. By comparing state usage to regional rather than national usage, effects of climate on usage are somewhat moderated in this analysis.

The equation using these variables, which explains 81.7% of the variation in this cross-sectional data is given below. Numbers in parentheses are t-statistics:

Average 2010 rate in any given state =

1.705 cents/kWh + 80.173% X average rate in EIA region including that state
(1.47) (7.42)

– 0.00005291 X (monthly kWh usage in state – monthly kWh usage in EIA region)
(3.62)

+ 2.568 cents if state is California -1.321 cents if state is Pacific Northwest
(1.99) (1.85)

+ 1.516 cents if state is deregulated
(2.74)

All of these variables are statistically significant at a confidence level of 7% or better, and the deregulation variable is significant at a 0.9% confidence level.

The second attempt to tease out the impacts of deregulation was to look at differences in residential rates within the same states from 1995 (before deregulation took hold) to 2010.[2] Because each state was compared to itself, differences in fuel mix and other regional factors need no further control. Rates were higher in 1995 in the states that eventually deregulated (10.43 cents/kWh versus 7.25 cents/kWh in non-deregulated states). But the difference in 2010 rates was more pronounced. The 2010 rates in deregulated states rose 4.16 cents/kWh to 14.59 cents/kWh. The rates in non-deregulated states rose 2.68 cents/kWh to 10.06 cents/kWh. Costs increased by 1.35 cents/kWh more in states that deregulated than in states that did not deregulate. The results were statistically robust at a confidence level of 0.1%.

[2] An EIA data base (EIA, 2010a) contains data on rates for 1990-2010 for residential, commercial, and industrial customers.

Coming back to our case study, Texas has the 13th largest change in residential rates from 1995-2010 (3.83 cents/kWh), and 8 of the 12 higher states were deregulated. Figure 2 graphically depicts the results.

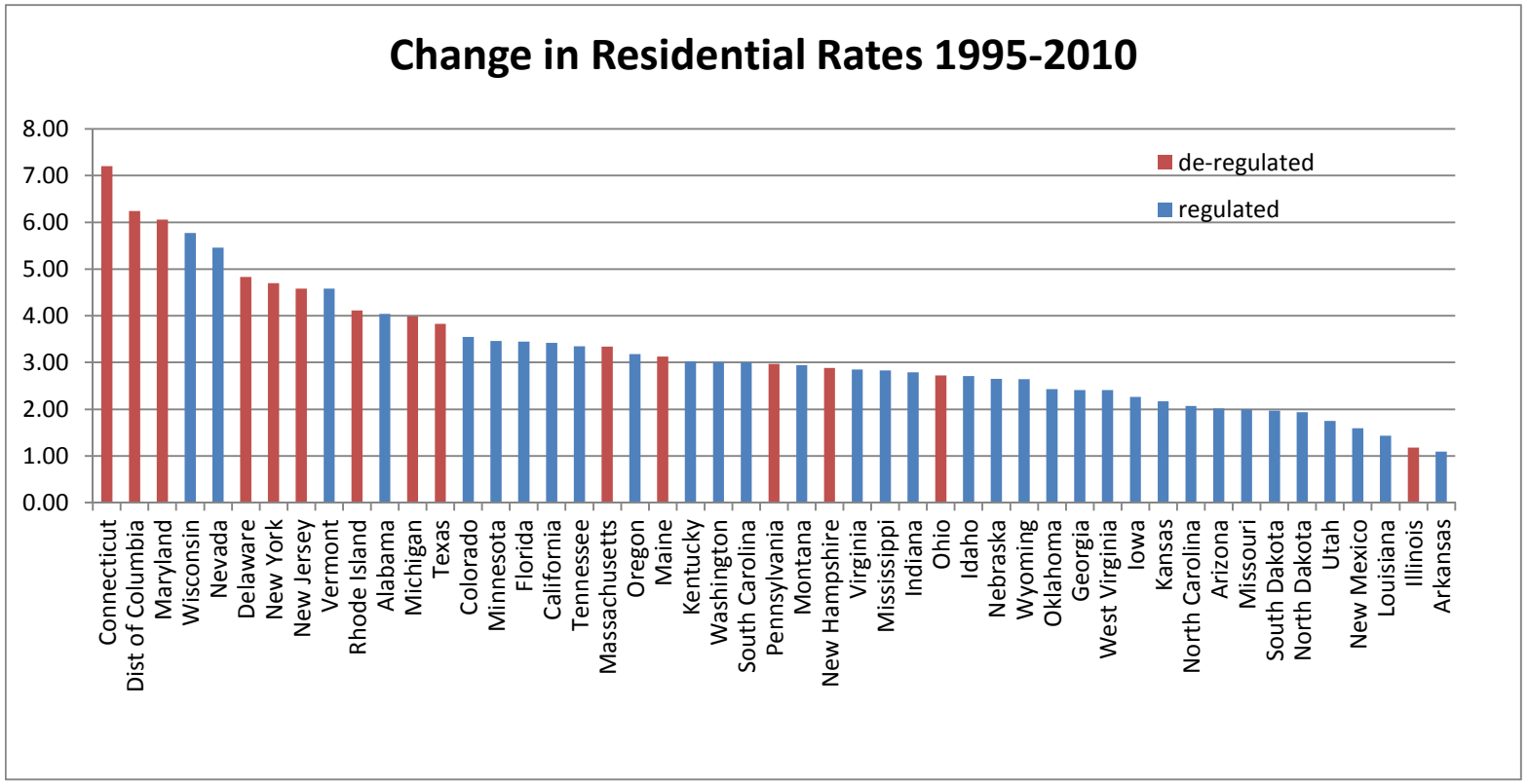
Similar differences are observed for commercial and industrial rates. Commercial rates in 2010 increased from 1995 by 3.44 cents/kWh in deregulated states and 2.49 cents/kWh in states with continued regulation, a difference of 0.95 cents/kWh. Industrial rates increased by 3.38 cents/kWh in deregulated states and 2.16 cents/kWh in states with continued regulation, a difference of 1.22 cents/kWh.

Conclusion

This analysis suggests that there is about a 10% increase in residential rates associated with deregulation after using two methods to control for underlying differences in costs between states that did and did not deregulate. Both methods used to control for differences in cost provide similar results (residential rate increases in deregulated states of 1.51 and 1.35 cents/kWh respectively).

The average residential rate in a deregulated state is 14.6 cents/kWh; this analysis suggests that it would be on the order of 13.1 to 13.3 cents/kWh without deregulation. The states that did not deregulate electricity had lower costs on average – about 10.1 cents/kWh in 2010. Increases of slightly smaller magnitudes due to deregulation may also be supported for commercial and industrial rates.

Figure 2: Change in Residential Rates, 1995-2010



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