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Should we reconsider competition in residential electricity supply?
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ABSTRACT: Retail competition has been introduced in many states as part of electricity industry deregulation. Following problems in the electricity market in California in 2000/01 many states, including NC, put deregulation plans on hold. Where retail competition is allowed consumers can choose their electricity supplier, and companies can compete for customers on the basis of rates and/or other options such as green energy choices. The welfare benefits of retail competition depend on consumers' willingness to switch suppliers, and in many cases people choose to stay with their current supplier even though rivals offer savings. In that sense consumers are 'sticky' in the same way they are with other services such as banking and credit. The question then becomes: should states reconsider retail competition or stay with the status quo? To help answer this question we survey residents in two North Carolina counties. Our survey focuses on: (i) households' knowledge of and interest in retail competition (ii) factors that would encourage them to switch suppliers, with an emphasis on smart meters and (iii) how large the potential savings would have to be to encourage switching.

Key words: electricity supply, retail competition, switching.

Section 1: Introduction

Despite nearly two decades of preparation and a number of state level attempts, competition in electricity supply remains tentative for large parts of the US. A number of federal regulatory Acts and Orders helped lay the foundation for wholesale and retail competition. Three notable examples were the 1992 Energy Policy Act and FERC Orders 888 and 889 of 1996. The 1992 Act empowered "FERC to order vertically integrated electric utilities to deliver competitive generated power over their transmission lines to wholesale customers, a process known as wholesale wheeling (Sidak and Spulber, 1998)." The 1996 Orders made the 1992 Energy Act more comprehensive by requiring transmission operators to allow open access to their networks on the basis of non-discriminatory tariffs. Order 888 also contained a concession from regulators to the incumbent utilities allowing them to recoup the cost of investments made before deregulation that may not have been cost effective under competition. The question then becomes: is now the time to expand retail competition in the residential sector.

Using survey data, we estimate factors affecting the desirability of (residential) retail competition to consumers in Western North Carolina. State level research on the feasibility of retail competition has tapered off since the break down of the competitive market in California in 2001. This is a problem since the rhetoric around restructuring in utility industries has recently become very focused on the demand side of the market. Figures 1a and 1b show the status of restructuring efforts in the US in 2001 and in 2010, respectively. In the figure for 2010 we have superimposed the average residential price for electricity in *1998*, two years after FERC Orders 888 and 889. We chose to illustrate prices in 1998 because, although the restructuring debate and requisite (federal) legislation occurred earlier, restructuring and/or competition itself was beginning in some markets at that time (e.g., California and Massachusetts). Average prices go a long way in explaining restructuring efforts across states. In most currently "active states" the average retail price was above the national average in 1998; the two exceptions were Texas and Oregon. In contrast, all of the "not active" states excluding Iowa, Alaska and Hawaii had rates below the national average. The "suspended" states had rates roughly in line with the national average apart from California, one of the earliest states to restructure. Overall, the average price in active states was 10.32¢/kWh while in suspended and non-active states it was 8.09¢ and 6.32¢, respectively (excluding Alaska and Hawaii where rates were well above the national average).

Many states, including North Carolina halted restructuring plans following the collapse of the California market in 2001.[1] A commission on the Future of Electric Service recommended to the state

[1] See Blumstein, Freidman and Green (2002) for a thoughtful discussion of the history of events in the California market.

legislator in April 2000 that NC deregulate by January 2005 with fifty percent of customers being given supply choice at that time and the remainder a year later. By January 2001 these plans were postponed.[2] Comparing the maps in Figure 1a and 1b it is clear that many states backed off on their restricting plans following events in California.

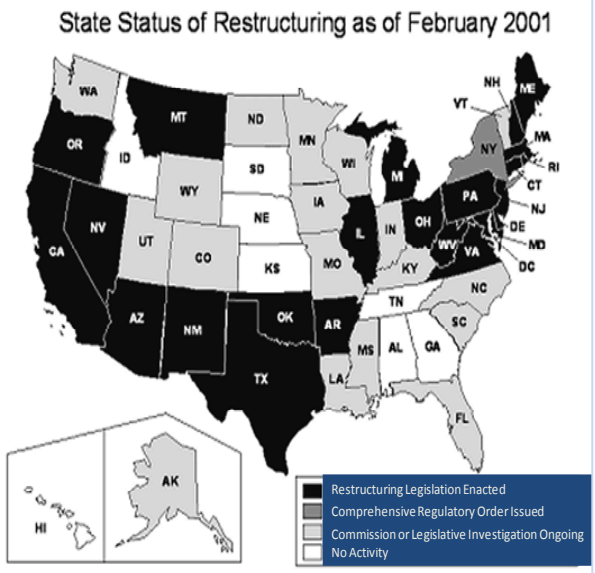

Figure 1a. Source *EIA*.

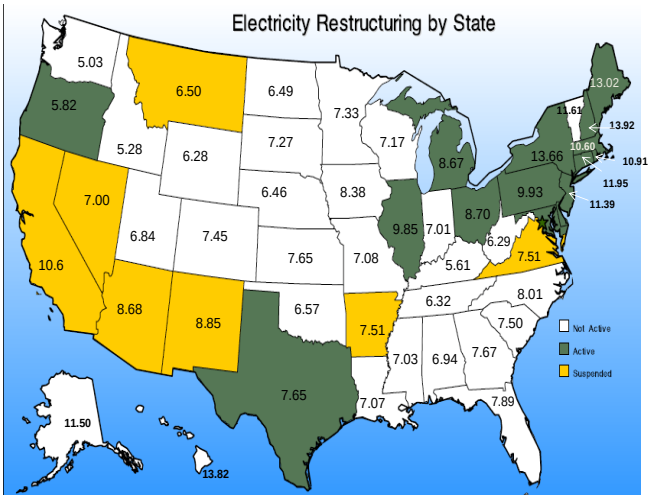

Figure 1b. Restructuring as of September 2010. Source: EIA.
http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html
Real residential prices (¢/kWh), 1998. US average residential price 8.26¢/kWh. Source:Electric Power Annua
2009 1990 - 2009 Average Price by State by Provider (EIA-861)

For various reasons, restructuring and energy efficiency goals have recently become more concentrated on the demand side of the market. Former discussions and academic pursuits focused on creating and improving markets for power generation. This, in many cases, involved breaking up integrated companies into transmission, generation, and retail functions. Thus, the natural monopoly transmission segments of the market were separated from the potentially competitive generation and retail functions. In some markets, such as Great Britain, and some regions such as Pennsylvania-New Jersey-Maryland (PJM) this process moved forward relatively quickly. In the England and Wales market (which has since been expanded to include Scotland) the restructuring process began in the late eighties and early nineties and the residential market was opened to competition as early as 1998. The US market by contrast is much more complex and segmented, and many policies are determined at the state level. Not surprisingly, the process has been slower in the US.

[2] EIA, Status of Electricity Restructuring by State, http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html, and The Chronical.com (April 9, 2000), "N.C. legislature calls for deregulation of electricity."

There is an expectation that increased focus on the demand side will lead to more innovations and value added than continued emphasis on cost cutting at the wholesale level:

> "*Arguably most of the efficiency gains from restructuring will come from the demand side…Unfortunately, nearly all markets have paid too little attention to the demand side, and many markets began by effectively killing retail competition. This is unfortunate, since the much needed innovation on demand management systems and contracts is likely to come from retail competition.*" (Cramton, 2003, p. 6).

The current stock of residential meters must be replaced to enable real consumer response to changing prices, but hardware and installation costs have historically been prohibitively high. These costs continue to decline, however, and many utilities are now installing smart meters in their service areas.[3] This proactive move is partly in anticipation of future requirements to move retail customers to time varying tariffs even though the meters will not immediately be used for that purpose. Utilities have also benefited from $3.9 billion in stimulus money earmarked for investments in smart grid technology and electric transmission infrastructure.

It makes sense to adopt more digital technologies in the home if those technologies are cost effective and improve market efficiency. For example, Google PowerMeter offers customers fitted with a smart meter the ability to see how much power their home is using. A local power company, Blue Ridge Electric, has a webpage explaining to its smart meter customers how to install and use this Google software.[4]

Likewise, the internet makes it easier to educate customers and provide price comparisons. For example, The Texas Electric Choice, and Pennsylvania's PA Power Switch websites help consumers compare prices and choose new suppliers.[5] Consumers without consistent internet access and some older residential customers would be disadvantaged, however, if the internet became the primary source of information dissemination. This disadvantage could be minimized through the use of aggregated communities of individuals, some of whom will be better informed than others. Littlechild (2008) describes the use of aggregation in Ohio.

Joskow (2000) discusses various ways for retail competition to provide value added:

[3] Cost plus installation is approximately $100 per household (based on private conversations with a utility provider and Allcott, 2009).
[4] http://www.blueridgeemc.com/member-services/google_powermeter.asp.
[5] http://www.powertochoose.org/ and http://www.papowerswitch.com/shop-for-electricity/, respectively.

> *"…the primary social value of increasing [the] role of [electricity service providers] is to provide enhanced customer services which provide value added to consumers over and above what consumers realize by purchasing at wholesale through the [electric distribution company]. These services include enhanced metering and control technologies, price and consumption hedge contracts, total energy management services, bundling of a gas, electric, telephone service…*" (Joskow, 2000, p.5)

Joskow (2000) goes on to describe how retail competition could improve the performance of wholesale electricity markets. He cites these potential benefits: "increased liquidity in spot and forward markets, demand management in response to spot market price movements to mitigate market power problems when capacity is scarce and demand is otherwise inelastic, and contracting to insure against price spikes," (p. 8).

Giving consumers access to time varying or real time prices would potentially add value in the industry if demand elasticity increased. As long as most consumers remain on regulated tariffs there is little reason for them to make behavioral changes that take the relative price of power into account. An overall increase in tariffs would have some effect on consumption, but not in a way that would bring down the cost of delivering power. To do that there has to be less consumption at the peak when the distribution network is most stressed. Pilot studies examining the effects of time varying prices have not found substantial customer savings, however. For example, Allcott (2009) used data from a Chicago pilot study and found that transitioning from flat rates to real time prices resulted in a compensating variation for participating households of about $10 per year or 1-2% of electricity expenditure. Overall the benefits might be lower since households self-selected into the experiment and likely had higher than average price responsiveness.

There remain important downsides and uncertainties associated with retail competition. While many agree that the potential benefits of competition outweigh the cost for large industrial and commercial customers, the anticipated costs and potential for abuse are greater for residential customers. Finding the best competitive model, devising default services for customers unlikely to switch suppliers, and handling regulatory uncertainty are additional challenges. Nevertheless, retail competition is becoming more feasible, so we ask whether households in two North Carolina counties would be interested in having access to smart meters and competitive electricity supply. In addition, we ask what level of savings would incent them to switch providers. Our survey results, their connection to the previous studies and state level experiences are discussed below.

Section 2: Survey and Data Analysis

Two North Carolina counties were chosen for the survey. Watauga County is located in the mountains in the northwest part of the state. The population is approximately 46,000 and peak energy use occurs in the winter. The town of Boone and Appalachian State University are in Watauga County. Forsyth County is more urban and warmer though still located in the northwest portion of the state. Forsyth has a population of approximately 360,000; Winston Salem is the largest city and Wake Forest and Winston Salem University both are in Forsyth County.[6]

The mail survey was conducted in October and November 2009. The first mailing consisted of 2100 households, half in Watauga County and half in Forsyth County, North Carolina. Approximately 10% of the surveys were undelivered, leaving us with 891 delivered in Watauga and 991 in Forsyth. A follow-up postcard was sent to all households approximately one week after the initial mailing. Excluding bad addresses, a second mailing of the full survey was sent to all non-responders 3 weeks later. In total we received 372 responses from Watauga households (42% of delivered surveys) and 357 responses from Forsyth households (36% of delivered surveys). Table 1 shows the demographic characteristics of our sample.

Table 1: Demographic Data

	Watauga	Forsyth
Average income	62,879	73,197
Age[7]	61	61
Male (%)	59	63
% of sample with some undergraduate education	47	59
% of sample with some graduate education	29	22
% of responders who are responsible for paying the electricity bill	86	85

This paper discusses three basic questions. First, what is the current level of familiarity with retail competition and what characteristics result in individuals being more favorable toward it?

[6] Forsyth County was chosen as a second survey area because it is more urban and warmer than Watauga County while being closer to Appalachian State University than more metropolitan areas such as Mecklenburg County where Charlotte is located. We feared our response rate would suffer if we had chosen a county too far away.

[7] The age data is highly symmetric with a median, mean and mode around 60. Given the fact that this was a mail survey about energy efficiency and retail competition, the high average is not too surprising.

Second, what supply options (not currently received) would entice households to consider an alternative supplier? Third, holding supply characteristics constant, how much would the monthly electricity bill have to decline to encourage switching?

In general, we find that fewer than half the sample respondents in both counties are currently familiar with retail competition but more than half would favor it. Similarly, approximately three-quarters consider it important to be able to choose their electricity provider. We also asked responders about their experience switching suppliers in other industries. Approximately 30% of the overall sample had switched either their telephone or television provider in the past three years. This experience might affect how comfortable they are with the process of changing providers and may also affect their attitude toward competition in utility markets.

In Table 2, we focus on attributes of service that might entice responders to switch to an alternative provider, assuming all other aspects of their service remained the same.

Table 2: Switching preferences

% customers who would (very or somewhat likely) switch if offered:	Watauga	Forsyth
Smart/hourly meter (no fee)	65	57
Incentives to weatherize	62	62
Green energy options	61	63
Green options but $5/month bill increase[8]	30	36

We find that access to smart matters, incentives to weatherize and a free green energy option would all encourage a majority of respondent to switch providers. Green energy options with a fee increase would only encourage about a third of respondents to change providers. The data in Table 2 underestimate the actual percentages because subjects who responded that their provider already offers green options or incentives to weatherize are not included (approximately 19% of the overall sample). We did not include improved reliability as a reason to switch since current providers continue to maintain the distribution lines under most competition models.

[8] For many respondents this question was a missing value. We recoded the variable as 0 if they responded 'not likely' or 'don't know' to the previous question which asked how likely they would be to switch if another company offered more green energy options (such as purchasing more power from renewable sources like solar and wind).

Finally, we present the results from the regression analysis. Our dependent variable is 'savings', the amount a household stated their electricity bill would have to fall (all else equal) to encourage them to switch to another supplier. The distribution of responses is shown in Table 3.[9]

Table 3: Savings required to switch providers

D5. If another company offered exactly the same services and quality as your current electricity provider, how much would your electricity bill have to decrease each month to encourage you to switch to the other company (Please circle one)							
	$0 - $4	$5 - $9	$10 - $14	$15 - $20	> $20	Don't know	Average savings
Watauga(%)	3	8	20	21	29	19	$17.04
Forsyth(%)	4	10	24	22	26	16	$16.22

The data is both left and right censored, so we use a Tobit model for this part of the analysis. The Tobit model specification is: $y^* = \boldsymbol{x}'\beta + \varepsilon$ where ε is a continuous random variable with mean zero and variance σ^2. y_i^* is a latent variable with:

$$y_i^* = \begin{cases} y_i^* \; if \; a < y_i^* < b \\ a \; if \; y_i^* \leq a \\ b \; if \; y_i^* \geq b \end{cases}$$

The expected value of the dependent variable is:

$E[y|\boldsymbol{x}] = aProb[y^* \leq a|\boldsymbol{x}] + bProb[y \geq b|\boldsymbol{x}] + Prob[a < y^* < b|\boldsymbol{x}]E[y^*|a < y^* < b]$

where *a* and *b* are constants taking on values of 2 and 25, respectively in our model.[10]

As a check on the sign and significance of the Tobit results, we also estimated an ordered logit model where the dependent variable is the ordinal value of responses; e.g., 0-4 was coded as 1, etc. The 'don't know' responses were excluded. The Tobit and ordered logit results are shown in Table 4.

[9] The data for the value question were coded at the midpoint of the intervals in Table 3 except for 'More than $20' which was coded as 25. We therefore estimated a Tobit model allowing for both left and right hand censoring (at 2 and 25).
[10] Greene(2003).

Table 4. Tobit models using marginal effects, and ordered logit using robust standard errors.
y = savings. p-values are in parentheses.

Variable	Model 1 (Tobit)	Model 2 (Tobit)	Model 3 (ologit)
predicted value	switch = 15.25	switch = 15.30	
County	.6406 (0.058)	.5281 (0.122)	.2594 (0.134)
Income	.0000161 (0.007)	.0000159 (0.008)	.00000751 (0.006)
Age	-.0242 (0.048)	-.0240 (0.052)	-.0106 (0.075)
Male	-.0432 (0.901)	.0590 (0.866)	.0209 (0.901)
Race	-1.5203 (0.041)	-1.6114 (0.029)	-.7422 (0.063)
College	-1.4702 (0.002)	-1.4917 (0.002)	-.7123 (0.002)
Professional	-2.2110 (0.000)	-2.1868 (.000)	-1.0201 (0.000)
Favor		-.7339 (0.038)	-.3334 (0.075)
Priorswitch		-6691 (0.062)	-.3237 (0.063)
N	507	504	504
Left censored	22	22	
Right Censored	165	165	

Model 1 does not control for respondents' prior experience switching providers in other industries (*priorswitch*) or whether they favor competition (*favor*). These controls are added in models two and three. The results for the demographic variables do not change substantially when these two variables are included.

Respondents with a college education require less savings to switch suppliers than those with a high school education, and adding professional/post-graduate education lowers the savings more. Of course, education is correlated with income which is also significant but positive.[11] Age and race are negative and significant meaning older respondents require less savings to switch and whites require less than non-whites.[12] Being favorable towards competition and having experience switching in other industries reduces respondents required savings also.

[11] With an interaction term between the education variables and income, the education variables remain significant, but not income.
[12] We note, however, that there is not much variation in our race variable.

To determine characteristics that make respondents more favorable toward competition we estimated a logit model with the form:

$$p(favor = yes|\boldsymbol{x}) = \frac{1}{1 + e^{-\beta'\boldsymbol{x}}} \quad \text{where}$$

$$\beta'\boldsymbol{x} = \beta_0 + \beta_1 county + \beta_2 income + \beta_3 age + \beta_4 male + \beta_5 race + \beta_6 college + \beta_7 professional + \beta_8 priorswitch.$$

These results are shown in Table 5.

Table 5: Logit model, y = favor retail competition (p-values)

n = 612	Prob > chi^2 = .0001
Constant	-20.019 (.108)
County	-.2056 (.245)
Income	.00000137 (.659)
Age	.0101 (.113)
Male	.3375 (.061)
Race	-.0091 (.984)
College	.4649 (.047)
Professional	.4711 (.090)
Priorswitch	.6607 (.001)

Respondents with either a college education or a professional degree are both more favorable towards competition than those with a high school education but the coefficient on the professional degree is only significant at the 10% level. Males are also somewhat more likely to favor competition than females. Lastly having experience switching in other industries increases the probability of favoring competition between electricity providers suggesting that individuals who have switched either their telephone or television suppliers find these choices beneficial and would like to have them available in the electrical market.

Section 3: Discussion.

North Carolina has relatively low residential electricity rates though they are close to the national average. Table 6 shows the rates for the four providers in our survey areas.

Table 6: rates and ownership for the electricity companies in our survey area

Utility	Ownership	Average residential rate cents/kWh	Number of NC Customers
Blue Ridge Electric	Cooperative	11.01	61,640
New River Light and Power Company	Public (University owned)	8.12	5840
Duke	Investor Owned	8.22	1,563,543
EnergyUnited	Cooperative	10.33	104,083
NC		9.52	
US		11.26	

Source: EIA. Electricity Sales, Revenue, Average Price 2008. Table 6 and Table 5a.

New River Light and Power Company is owned by Appalachian State University and has a very small, dense customer base in downtown Boone, North Carolina. Blue Ridge Electric services other areas of Boone and the remainder of Watauga County. Duke Energy supplies most of the customers in Forsyth County; a few are served by Energy United.

Based on model 2 in Table 4 the probability of 'savings' being uncensored and the conditional predicted value of 'savings' are:[13]

$$P(2 \leq \text{savings} \leq 25) = .6931$$
$$E(\text{savings}|2 \leq \text{savings} \leq 25) = 15.30$$

The conditional (censored) reduction on the electricity bill that would incent customers to switch suppliers is $15.30/month across the two counties (all else equal). To compute a rough estimate of the equivalent reduction in *tariff* rates we use summary data for NC as a whole. The average monthly residential consumption in NC for 2008 was 1120 kWh; the average bill was $106.61 and the average price was 9.52¢/kWh.[14] A reduction in the monthly bill of $15.30 would be a reduction of approximately 14.35% a month or 1.37¢/kWh.

[13] These estimates are calculated using Stata where the mean of the independent variables is used for predicted values.

[14] U.S. Energy Information Association, Table 5A. Residential Average Monthly Bill by Census Division, and State 2008.

Is this a realistic reduction in rates? It is tempting to answer this question by looking at the experience of states with residential retail competition. Kwoka (2008) discusses the problems with that approach. For example, some states introduced competition as early as 1996 and rates were initially capped to allow utilities to recover stranded costs. In many cases those caps are just expiring. Where they have expired more companies have entered the market to compete. Some utility's rates increased after the cap expired because they had not previously risen to account for increased generation costs. Pennsylvania's experience illustrates this. Seven of eleven investor owned utilities had their caps expire before or during 2009. In 2009, five of these 7 suppliers all had average retail rates above Pennsylvania's national average of 11.35 ¢/kWh. Table 7 shows average residential prices for these 11 companies in 2008 and 2009.

Table 7: Prices and proportion of customers for 11 Pennsylvania Investor Owned Utilities.

Company	Rate Cap Status	% of PA Ratepayers	2008¢/kWh	2009¢/kWh
Citizens Electric Co.	Expired	0.1	11.02	11.10
Duquesne Light Co.	Expired	10.6	13.45	13.58
Pennsylvania Power Co.	Expired	2.8	12.00	12.66
Pike County Light & Power Co.	Expired	0.1	16.37	12.79
UGI Utilities Inc.	Expired	1.1	13.61	13.87
Wellsboro Electric Co.	Expired	0.1	13.89	13.19
PPL Electric Utilities Inc.	Dec. 31, 2009	24.6	10.18	10.33
Metropolitan-Edison Co.	Dec. 31, 2010	9.5	10.43	11.38
Pennsylvania Electric Co.	Dec. 31, 2010	10.6	10.30	10.47
PECO Energy Co.	Dec. 31, 2010	27.8	14.42	14.43
West Penn Power Co.	Dec. 31, 2010	12.7	7.69	8.45
Average PA retail price			11.35	

Investor Owned Companies. 2008-09 Pennsylvania Public Utility Commission Annual Report, p. 35.
2009-10 Pennsylvania PUC Annual Report, p.37. Prices from *EIA*, 2008 and 2009

Another (popular) example is the case of San Diego where rates were allowed to adjust competitively in 2000. The wholesale market in California was restructured in 1998 but retail rates remained fixed. As discussed in Bushnell and Mansur (2005) SDG&E recovered stranded costs by the middle of 1999 allowing them to adjust rates to match market prices. Rates fell slightly in the beginning but almost doubled by August 2000 when there was a sharp increase in wholesale prices. This led to a retroactive rate freeze for small and medium sized customers. Bushnell and Mansur

examined the demand response to the volatile price signals that occurred during this period. They find consumers are more responsive to the prices they saw in their last bill than to current market prices. "During the months when retail rates were deregulated for all SDG&E customers, we estimate an elasticity of demand with respect to lagged prices (which nearly doubled by August, 2000) equal to -0.10. By contrast, the effect of current prices on current consumption is not significant after retail rates were deregulated. With our [difference-in-difference] model, we find a reduction in average consumption of approximately 5% when prices peaked in August and an even larger 7% reduction in September, *after* most customers' prices returned to historic levels" (p.495). They caution these results are not long run results since consumers could be expected to be more price responsive if prices remained high for a longer period of time. Moreover, consumers were receiving very mixed signals via the legislative actions taken to reduce tariffs.

North Carolina's generation mix is very different from California's where electricity prices rose largely because of rising natural gas prices around the time San Diego's rates were adjusting. Figure 2 shows average wholesale prices and natural gas prices in the US 2001-2007 while Figure 3 shows the generation mix in NC, the US and California. NC's electricity sector is more coal and nuclear intensive than the rest of the country and California's industry is much more natural gas intensive; thus, electricity prices in California were more vulnerable to spikes in natural gas prices than other parts of the country.

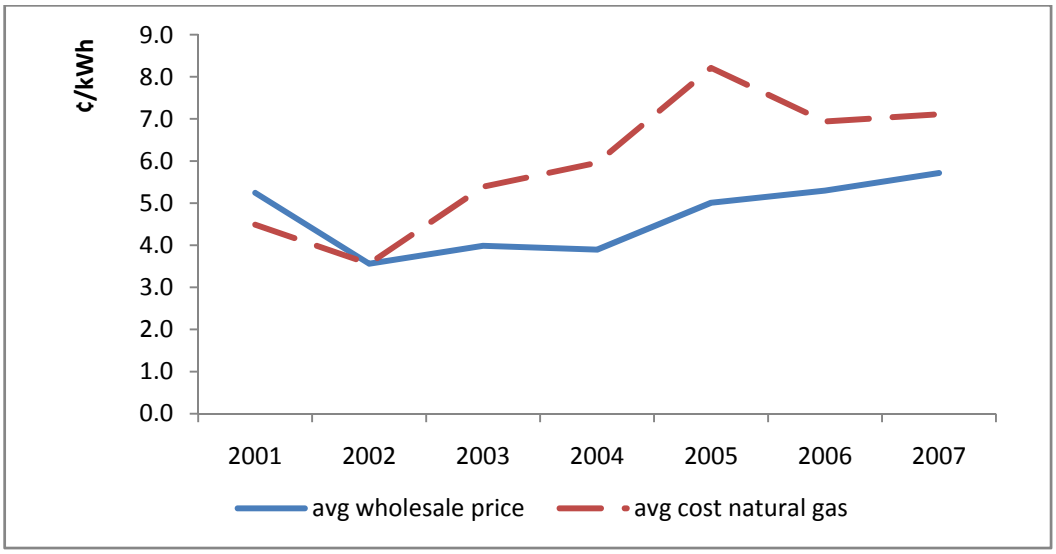

Figure 2. Sources: U.S. EIA, Form EIA-861, Annual Electric Power Industry Report.
Table 2. Average Wholesale Price by NERC Region, 2001 - 2007
Table 8.1. Revenue and Expense Statistics for Major U.S. Investor-Owned Electric Utilities, 1998 through 2009

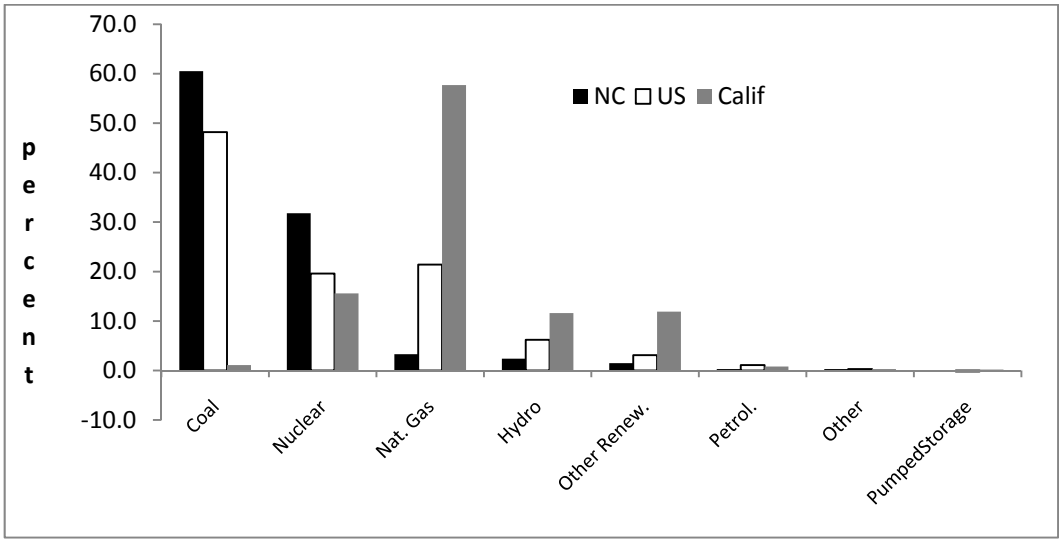

Figure 3. Source: EIA, Table 5. Electric Power Industry Generation by Primary Energy Source, 2008

In Texas, where retail competition began in 2002 and has largely been viewed as a success, price caps expired in 2007. Kang and Zarnikau (2009) show evidence that prices have since begun to fall. The electricity industry in Texas is also heavily reliant on natural gas, so electricity prices rose steadily along with natural gas prices in 2004 and 2005. According to Kang and Zarnikau, electricity prices remained high even when natural gas prices began declining in 2006 (figure 1, page 1715).

In general a state's experience with retail competition will depend on its policy toward stranded cost recovery, strategies for providing default services to customers who choose not to switch suppliers and its current generation mix. North Carolina's access to cheap coal has kept prices below the national average, but prices could increase as the state's commitment to greener technologies strengthens. As that happens there will be more avenues for suppliers to provide value added services, and the support for competition could improve as a result.

Section 4 Conclusion

We conducted a mail survey of two disparate counties in western North Carolina to gauge consumers' opinions about retail competition among electricity providers and to estimate their required savings to switch providers. Just under half of our respondents claimed to know something about electricity retail competition; about 75% of responders in each county believe it is important that consumers be able to choose their utility provider, and 50-65% favor retail competition in N.C. Our results show that respondents with undergraduate and post-graduate education are more likely to favor competition than those without college experience, and males

are somewhat more likely to favor competition than females. Respondents who have recently switched television or phone providers are more likely to favor competition, and they would require less savings to switch than those who have not recently switched providers in these other industries. On average households state they would be willing to switch electricity providers (all else equal) for a rate reduction of approximately 1.4¢/kWh. There were no strong differences between the two counties.

Given that prices in N.C. are still regulated and below the national average, savings of this magnitude are unlikely because it would make it difficult for alternative suppliers to compete. Value added services from smart meters could bring down competitors' costs, but not necessarily below the incumbents' (some of which have already rolled out smart meters). Consumers may gain more from the benefits of smart grid technologies and time varying prices than from possibilities to switch providers. Given the current state of regulation in North Carolina the cost savings need to encourage retail competition is unlikely. So to answer the question: "is now the time to allow retail competition in the residential sector in North Carolina?" Our survey suggests that from a purely consumer welfare perspective the answer is no. If, however, retail competition encourages cost savings on the production side then the answer might be yes but that is beyond the scope of our analysis.

In the future we would like to conduct a larger study of the southeastern US to form a better picture of consumer preferences in this part of the country where electricity has been historically cheap due largely to the dominance of coal (and nuclear) in the generation mix.

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