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# Trends in prices to commercial energy consumers in the competitive Texas electricity market ☆

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**Abstract**

To date, the price of electricity or commercial of business energy consumers has generally increased at greater rates in the areas of Texas where retail competition has been introduced than in areas that do not enjoy competition. Trends in commercial competitive prices have largely mirrored trends in residential prices. Market restructuring has tended to increase the sensitivity of retail electricity prices to changes in the price of natural gas, the marginal fuel used for generation in Texas. Consequently, the rapid increases in the commodity price of natural gas following restructuring led to increases in competitive electric rates which exceeded the increases in areas not exposed to restructuring, where the fuel component of electric rates tend to reflect a weighted average of the utilities' fuel costs. There is some evidence that pricing behavior by competitive retailers changed when the retailers affiliated with the incumbent utilities were permitted some pricing flexibility, resulting in a reduction in prices.


*Keywords:* Electricity market restructuring; Electricity prices; Deregulation

## 1. Introduction

The introduction of retail competition into the service areas of the investor-owned utilities within the Electric Reliability Council of Texas (ERCOT) market is generally viewed as North America's most successful effort to restructure an electricity market to introduce competition at the retail level (Center for Advancement of Energy Markets, 2003). Competition among retail electric providers (REPs) for customers is intense and consumers enjoy a variety of choices among suppliers and services. The rates at which utility customers have switched from a retailer associated with their traditional utility supplier to a competitive REP are relatively high.

Yet, some observers have questioned whether the state's restructuring initiative may be responsible for greater electricity price increases than would have occurred absent restructuring. It has been noted that residential electricity rates have generally increased at higher rates in areas of Texas which have opened to retail competition than in areas which have not (Zarnikau and Whitworth, 2005). Nonetheless, a motivated residential consumer who successfully "shops around" for power may be able to achieve some savings (PUCT, 2006).

In a number of other states (e.g., Connecticut, Delaware, Illinois, Maine, Maryland, New Jersey, Pennsylvania, Rhode Island, and Virginia), there have arisen concerns that prices may have increased faster in markets which have undertaken restructuring than they would have otherwise (Sioshansi, 2007). Apt (2005) compares industrial rates among states within these two categories within various regions and finds no evidence that restructuring has led to lower prices of electricity to industrial energy consumers. Rose and Meeusen (2005) conclude that no discernable overall benefit to consumers from restructuring can yet be identified. Concerns regarding rising prices in areas of North America opened to retail competition have

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been widely reported in the press. Example articles include Varrionuevo (2007), Johnson (2006), Wilder (2006), and Smith (2006). In contrast, recent analysis sponsored by the Edison Electric Institute (Brattle Group, 2006) concludes that "since restructuring discussions were initiated in the early-to-mid 1990s, rates in restructured and non-restructured states have trended similarly." Axelrod et al. (2006) claim that restructuring has lowered retail rates. Spinner (2006) notes problems in some of the recent studies claiming to have found great benefits to consumers as a result of restructuring. Joskow (2006) found no consistent pattern in the trends in real industrial prices for states that implemented retail competition compared to states which had not.

Price trends and comparisons in residential electric rates can be easily performed using data from surveys of REPs conducted by the Public Utility Commission of Texas (PUCT). These data are closely followed by local newspapers, which have been generally skeptical over whether restructuring has led to price reductions for retail consumers. However, no such survey is performed for the prices quoted to commercial and industrial energy consumers in the competitive areas of the state. Thus, it is less evident how commercial and industrial electricity rates have been affected by restructuring in Texas.

A second interesting policy question is whether retail electricity rates changed when REPs affiliated with the traditional utility provider were provided with some pricing flexibility. In Texas, the commercial sector PTB prices transitioned from being the only price that an incumbent retailer could charge to merely a price cap in the competitive service areas between December 2003 and February 2004.

In order to compare commercial electricity price trends in competitive areas of Texas against prices in areas not open to competition, we use a large sample of price quotes from REPs to load aggregators to establish a simple econometric model which predicts the "generation price" which would be quoted to a commercial customer with certain load characteristics under particular market conditions. The model is used to back-cast commercial electricity prices in the competitive retail market since the start of retail competition in Texas for four different usage levels. We then compare the predicted price that would be quoted in competitive areas of Texas (including regulated transmission and distribution charges and other non-bypassable costs) against prices charged in areas not open to retail competition. Finally, we examine any structural changes in commercial price trends in the competitive areas that occurred when the retailers affiliated with the traditional electricity supplier in each service areas (the AREP) were permitted to charge prices other than the PTB in their former service areas.

## 2. Restructuring in Texas

Under Texas' plan to introduce retail competition, Senate Bill 7 from the 76th Legislative session (1999), customers of the investor-owned utilities in ERCOT were permitted to choose among various REPs beginning in January of 2002. The vertically-integrated electric utilities were required to separate or "unbundle" their operations into distinct generation, REP, and transmission and distribution entities before the start of customer choice. Transmission and distribution activities continued to be regulated, in recognition of their natural monopoly characteristics. Generation and retail activities were largely deregulated, although certification requirements, price caps, market rules, and various regulatory safeguards were established in order to preserve system reliability, mitigate the exercise of market power by market participants, and provide various customer protections. Further details are provided in Adib and Zarnikau (2006).

Table 1
Dates of expiration of PTB as the only price that can be offered by an AREP

| | |
|---|---|
| TXU Electric in TXU Electric Delivery service area | 3 February 20004 |
| Reliant in CenterPoint service area | 29 January 2004 |
| Mutual Energy (Direct Energy/Centrica) in AEP Texas north service area | 30 December 2003 |
| Mutual Energy (Direct Energy/Centrica) in AEP-Texas Central service area | 30 December 2003 |
| First Choice Power in Texas–New Mexico Power service area | 9 January 2004 |

While most commercial energy consumers in Texas now enjoy competitive options, many parts of Texas have not yet been opened to retail competition, including the service areas of investor-owned utilities (IOUs) outside of the ERCOT power region, municipal systems within Texas, and nearly all of the rural electric cooperatives within Texas.

Under the state's restructuring plan, retail price caps were imposed on the prices charged by AREPs.[1] Larger energy consumers in Texas (those with a billing demand over 1 MW) received no price cap protection. In January 2002, AREPs were required to reduce the electricity prices charged to residential and small commercial customers by 6%, adjusted for fuel rate revisions and certain stipulated base rate reductions not yet in effect by January 1, 1999. The resulting PTB provides a benchmark price for potential competitors. This PTB remains in effect for the first 5 years of retail competition.[2] However, an AREP can begin charging rates lower than the PTB after 36 months or when the AREP loses at least 40% of its residential and small commercial customer load to competitors. After either of these events occurs, the PTB establishes only a ceiling, and the AREP may also offer lower prices. As noted in Table 1, AREPs received authority to deviate from the PTB between December 2003 and February 2004.

[1] Public Utility Regulatory Act, Section 39.202.

[2] Proposals to extend the PTB for a longer period of time are likely to be debated by the Texas Legislature in 2007.

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Consumers on the PTB are free to leave the AREP to accept service from a competitive retailer (a "CREP") at any time.

The practice of indexing this PTB to natural gas prices, combined with the rapid increases in natural gas prices experienced in 2003 and 2004, has resulted in frequent price increases for residential and commercial customers that remained on this PTB. Since PTB changes are prompted by a request from an AREP, rate increases have been frequent and there have been few requests to lower a PTB.[3]

Adjustments to the fuel portion of the PTB are generally limited to two changes per year. While the AREP may rely on generation from a variety of fuels, all changes to the fuel component of the PTB are indexed to natural gas prices. Natural gas prices have been more volatile and have increased more than the cost of other fuels since retail competition was introduced.

CREPs have no legal constraints on their pricing. The prices quoted by CREPs are affected by a number of variables, including the level of regulated nonbypassable charges and generation costs. Electricity prices quoted by CREPs may change every day. Changes in natural gas futures prices explain much of the fluctuations in electricity prices. Overall, natural gas is used in the generation of over one-half of the electricity produced in the ERCOT market, and is the marginal source of generation over 85% of the time. Consequently, market prices for electricity are strongly tied to the market price of natural gas. Natural gas prices are in turn affected by national supply and demand for natural gas, deliverability constraints, weather forecasts, natural gas inventory estimates, and a variety of other factors. Prices in ERCOT's balancing energy market affect retail price quotes to some degree. These prices are in turn affected by the weather, natural gas prices, regulatory decisions, short-term market conditions, and long-term reserves margins. While electricity price quotes among providers have converged to some degree since the start of the competitive retail market in 2002, there remains considerable variation among price quotes from different REPs. The ERCOT market structure is described further in Adib and Zarnikau (2006).

## 3. Modeling competitive electricity prices to commercial energy consumers

It is difficult to analyze trends in the retail prices paid by commercial sector electricity consumers in the competitive ERCOT market because there is no public survey of retail prices quoted to commercial sector electricity consumers. Only data for residential prices in competitive areas are compiled by the PUCT.[4] Nonetheless, commercial prices trends over time may be estimated using databases containing the prices quoted by CREPs to load aggregators. These load aggregators work as agents for buyers of electricity and "shop around" for retail supplies of electricity. The clientele of aggregators include a variety of business customers in a variety of distribution utility services areas with a variety of load levels and patterns.

A simple model is employed here to predict electricity prices for a 12-month firm price contract in the competitive regions of ERCOT (GENPRICE) based on the following explanatory variables:

- The market price of a 12-month strip of natural gas at Henry Hub at the time of the electricity generation price quote (GASP). The units are in dollars per MMBTU.
- Load factor (LF) of the customer being quoted the price.
- The ERCOT congestion zone region. Corresponding variables in the model include: REGIONNORTH, REGIONNORTHEAST, REGIONSOUTH, and REGIONWEST.
- The date on which the price was quoted (YR), quantified as the number of years since January 1, 2000. For example, 3.5 would correspond to June 1, 2003.
- The average market clearing price of balancing energy (MCPE) on the day before the price quote.

A variety of model specifications were tested. The selected model is

$$\begin{aligned}\text{GENPRICE} = a &+ b1{*}\text{GASP} + b2{*}\text{MCPE} \\ &+ b3{*}\text{LF} + b4{*}\text{REGIONNORTH} \\ &+ b5{*}\text{REGIONNORTHEAST} \\ &+ b6{*}\text{REGIONSOUTH} \\ &+ b7{*}\text{REGIONWEST} \\ &+ b8{*}\text{YR} + b9{*}\text{PTB}. \end{aligned} \quad (1)$$

The variables for the ERCOT congestion region (REGIONNORTH, REGIONNORTHEAST, REGIONSOUTH, and REGIONWEST) were coded as binary, 0 or 1, variables. A variable for the Houston region was not explicitly included to avoid perfect multicollinearity.

The time variable, YR, was used to identify any trends in the generation price over time. Logarithmic time trend variables were also tested to permit a non-linear trend, but they did not appreciably improve the model fit.

1611 generation price quotes were obtained from databases developed by two load aggregators—Retail Energy Aggregators of Texas and Fox, Smolen, and Associates. The price quotes covered the period from November 2001 (for a retail supply of electricity beginning in January 2002) through September 2005. Price quotes from over 20 REPs are represented in this data set.

If both energy usage and billing demand data were available for a commercial customer, the customer's LF was estimated using the customer's billing determinants in the year prior to the price quote. In the remaining cases, the LF was estimated based on the mid-point value of the

[3]Only one PTB decrease has been requested.

[4]See: ⟨http://www.puc.state.tx.us/electric/rates/RESrate.cfm⟩.

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customer's LF category, as developed by ERCOT for settlement purposes (where Business High LF = 0.7; Business with an Interval Demand Recorder and a High LF = 0.7; Business Medium LF = 0.5; Business Low LF = 0.3; and Business with No Demand Data LF = 0.4).

The average balancing energy price corresponding to the day in which the price quote was made was obtained from the ERCOT web site. Similarly, the price of a 12-month strip of natural gas on the NYMEX on the day of that the electricity price quote was made was appended to the data set.

The binary PTB variable represents whether the incumbent REP was able to only charge the PTB. Its value was 1 for months up to December 2003 and zero thereafter.

The data set used in the estimation consists of 1611 observations. Each observation consists of the variables mentioned above.

The scatter plots below illustrate some of the patterns in the data. Fig. 1 displays the strong positive relationship between the price of natural and the electricity generation price for the 1611 observations. Fig. 2 shows the relationship between electricity generation price and MCPE, the market clearing price of balancing energy in dollars per MWh. The generation price generally increases with MCPE (Table 2).[5]

The coefficients, $a$, $b1$, $b2$, $b3$, $b4$, $b5$, $b6$, $b7$, $b8$, and $b9$, were estimated using ordinary least squares. Estimated coefficients are provided in Table 3. The coefficients associated with all variables significantly differed from zero at a 95% level of confidence.

The results of the regression analysis suggest that a \$1/MMBTU increase in the natural gas price (GASP) tends to increase the generation price by \$0.0054/kWh. A \$1/MWh increase in the market clearing price of balancing energy tends to increase the generation price by less than \$0.0001/kWh. There is an inverse relationship between LF and the generation price. The North region tends to have generation prices that are \$0.0026/kWh higher than Houston. The Northeast region tends to have generation prices that are \$0.00275/kWh higher than Houston. The South region tends to have generation prices that are \$0.00299/kWh higher than Houston. The West region tends to have generation prices that are \$0.00276/kWh higher than Houston. Increasing the year (YR) by 1 tends to increase the generation price by \$0.0055/kWh. Over 85% of the variation in generation prices from the average generation price in the data set is explained by this simple model.

Prices were higher when the PTB was the only price that could be charged by the REP affiliated with the traditional utility provider in the service area. Price competition from an incumbent provider tends to lower prices.

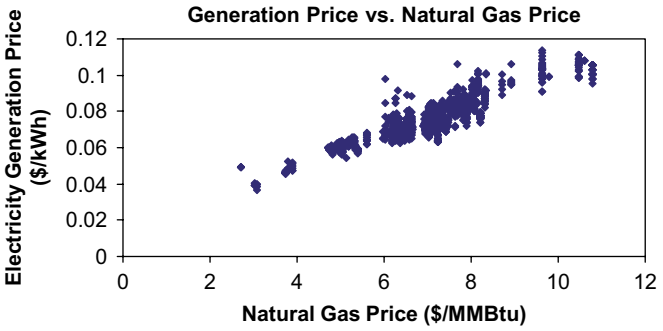


Fig. 1.

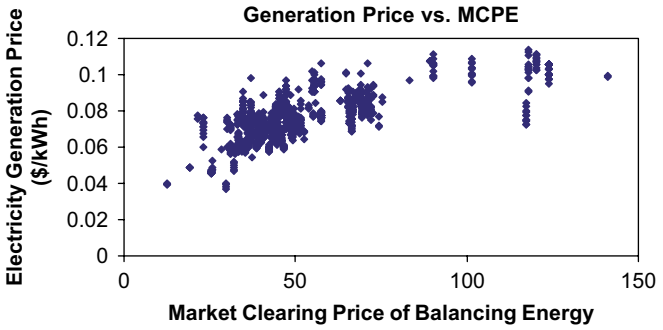


Fig. 2.

Based on these estimated relationships, prices were then back-cast in order to provide estimates of the competitive generation prices for every month since retail choice was introduced for each utility service area opened to competition for four different levels of usage and demand.

This regression model only provides the "generation price." In order to estimate the total price to commercial energy consumers in the competitive market, all of the regulated "non-bypassable charges" must be added to the generation price. These charges include the cost of transmission and distribution service and a variety of other charges (e.g., nuclear decommissioning costs, a system benefit fund charge, taxes, and various regulatory surcharges and credits). These non-bypassable charges were calculated from all of the applicable tariffs, which were in effect from January 2002 to present. A weighted average competitive commercial electricity price was also calculated, using service area sales in 2001 (the last year for which data are available) as the weights.

In order to provide some comparison groups, weighted average costs to commercial energy consumers have been calculated at four different usage levels for the service areas of three different groups of utilities in Texas. The first group, IOUs not offering competition, consists of El Paso Electric Company, Entergy-Gulf States Utilities, Southwestern Electric Power Company, Southwestern Public Service Company, and the portion of West Texas Utilities Company (or AEP Texas-North) that is outside of ERCOT. While these utilities participate in different wholesale power markets, they participate in similar

[5]The correlation coefficient between natural gas prices and MCPE is 0.78, suggesting the possibility of multicollinearity when both variables are used in the same regression. However, omitting MCPE does not appreciably change the back-casting results presented here.

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Table 2
Summary of price to beat increases

| Affiliated REP | Date approved: | Gas price $/MMCF[a] | % Increase | % Cumulative increase |
|---|---|---|---|---|
| TXU Energy | 12/21/2001 | 3.111 | Original | Original |
| | 08/26/2002 | 3.619 | 16.33 | 16.33 |
| | 03/10/2003 | 4.910 | 35.67 | 57.83 |
| | 08/25/2003 | 5.362 | 9.21 | 72.36 |
| | 05/19/2004 | 5.785 | 7.89 | 85.95 |
| | 08/03/2004 | 6.517 | 12.65 | 109.48 |
| | 05/11/2005 | 7.872 | 20.79 | 153.04 |
| | 11/02/2005 | 11.534 | 46.52 | 270.75 |
| Reliant Energy | 12/20/2001 | 3.111 | Original | Original |
| | 08/26/2002 | 3.729 | 19.86 | 19.86 |
| | 12/19/2002 | 4.017 | 7.72 | 29.12 |
| | 03/10/2003 | 4.956 | 23.38 | 59.31 |
| | 07/25/2003 | 6.100 | 23.08 | 96.08 |
| | 12/20/2004 | 7.499 | 22.93 | 141.05 |
| | 11/02/2005 | 11.387 | 51.85 | 266.02 |
| First Choice Power | 12/17/2001 | 3.111 | Original | Original |
| | 08/26/2002 | 3.817 | 22.69 | 22.69 |
| | 02/03/2003 | 4.526 | 18.57 | 45.48 |
| | 03/26/2003 | 5.166 | 14.14 | 66.06 |
| | 04/21/2003 | 5.958 | 15.33 | 92.52 |
| | 07/06/2004 | 6.454 | 8.32 | 207.46 |
| | 12/20/2004 | 7.45 | 15.43 | 239.47 |
| | 05/11/2005 | 7.845 | 5.30 | 152.17 |
| | 11/02/2005 | 11.387 | 45.15 | 266.02 |
| Central Power and Light | 12/20/2001 | 3.111 | Original | Original |
| | 08/26/2002 | 3.795 | 21.99 | 21.99 |
| | 03/24/2003 | 5.123 | 34.99 | 64.67 |
| | 03/15/2004 | 5.586 | 9.04 | 79.56 |
| | 08/09/2004 | 6.527 | 16.67 | 109.48 |
| | 04/29/2005 | 7.516 | 16.66 | 141.59 |
| | 11/02/2005 | 11.457 | 50.69 | 268.27 |

[a]Source: Public Utility Commission of Texas.

Table 3
Estimated coefficients from statistical analysis of price offers

| | Associated with the variable | Coefficient | Standard error |
|---|---|---|---|
| A | Intercept | 0.0069813 | 0.001535 |
| *b*1 | gasp | 0.0054239 | 0.000268 |
| *b*2 | mcpe | 9.333E-05 | 1.06E-05 |
| *b*3 | lf | −0.009715 | 0.000784 |
| *b*4 | regionNorth | 0.002634 | 0.000621 |
| *b*5 | regionNorthEast | 0.0027459 | 0.001181 |
| *b*6 | regionSouth | 0.0029854 | 0.000271 |
| *b*7 | regionWest | 0.0027624 | 0.000731 |
| *b*8 | yr | 0.0055231 | 0.000442 |
| *b*9 | PTB dummy | 0.0052339 | 0.000657 |

markets for fuels and face the same regulatory structure that the competitive service areas would have faced, had restructuring of the ERCOT IOUs not occurred. The rural electric cooperative group is comprised of South Plains Electric Cooperative, Upshur Electric Cooperative, and Victoria Electric Cooperative.[6] Among these three coops, only South Plains serves outside of ERCOT. The group of major municipal systems consists of City Public Service of San Antonio (CPS) and Austin Energy (AE). These two municipal systems participate in the ERCOT wholesale power market and the same market for fuels as the investor-owned systems affected by retail competition. Monthly price data for each of these utilities was obtained from the PUCT web site. The weights for each utility within each group based on their relative sales to residential energy consumers in 2001, as reported in by the US DOE.[7]

## 4. Results

Fig. 3 provides an illustrative comparison of price trends for commercial customers with a billing demand of 300 kW and 87,000 kWh in four service areas where competition was introduced (solid lines) and four service areas where

[6]While there are roughly 70 cooperatives serving Texas, these are the only rural electric cooperatives that consistently participated in the PUCT's electric bill survey during the study period.

[7]See: ⟨http://www.eia.doe.gov/cneaf/electricity/page/eia861.html⟩.

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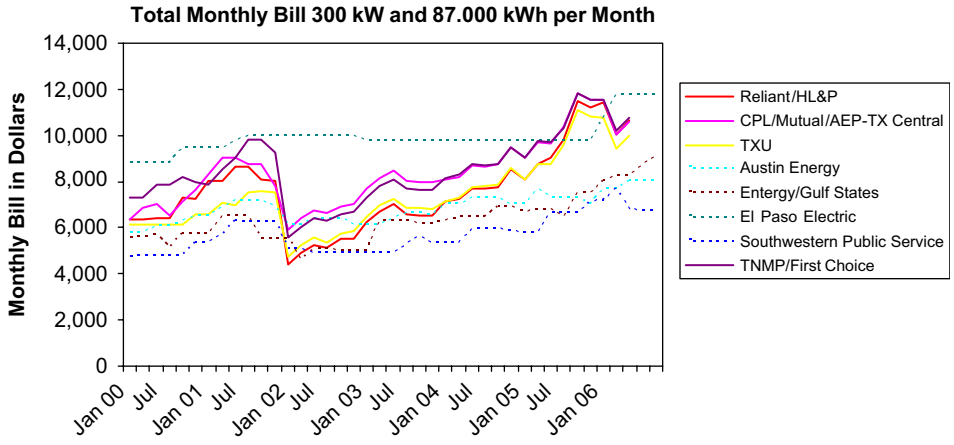


Fig. 3.

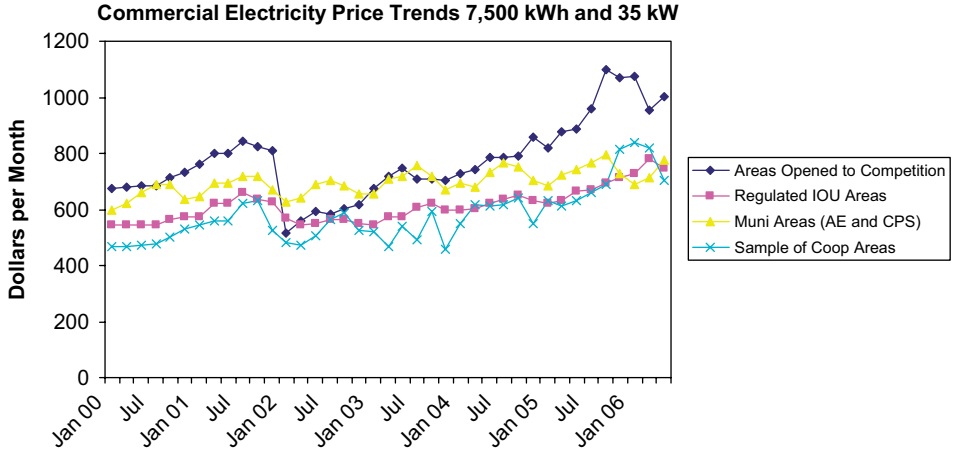


Fig. 4.

competition has not been introduced (dashed lines). Prices in the competitive areas have tended to converge over time, while greater variation can be seen in the prices among the IOU and municipal utility service areas where competition has not been introduced.

Fig. 4 compares commercial electricity price trends in the competitive areas against price trends in the comparison groups at a consumption level of 7500 kWh per month and a billing demand of 35 kW. Just prior to restructuring, prices were much higher in the soon-to-be-competitive areas than in other areas of the state. Much of this price differential was due to regulatory decisions which enabled the restructured IOUs to recover fuel under-collections prior to the start of retail competition. At the start of customer choice in early 2002, competition briefly provided a large discount in prices below their regulated tariffed levels. Through the end of 2004, competitive prices were in line with the prices charged in areas of Texas not opened to competition. However, prices in the competitive areas have exceeded average prices in areas not open to competition since that time. It should be noted that prices in two of the regulated IOU service areas were constrained by various regulatory rate freezes during some of this period, accounting for some of the gap.

For 35 kW commercial energy consumers with a higher LF, the differences in prices between the areas open to competition and the sample of rural electric cooperatives are not as significant as depicted in Fig. 5. Tariff features account for this difference in price patterns.

Fig. 6 suggests that trends in commercial price trends have closely followed trends in residential prices in the areas of Texas opened to competition. Fig. 6 is an updated version of the average residential price series constructed in Zarnikau and Whitworth (2005). It is assumed that residential customers who switch from their AREP receive 15% savings relative to the PTB. Switching rates are used to estimate the share of residential energy consumers who are charged the PTB versus the share who pay a competitive rate. In the first year of retail choice, commercial energy consumers were able to negotiate higher discounts from pre-restructuring tariffs than residential consumers. However, since the first year, price trends between residential and commercial energy consumers have been very similar.

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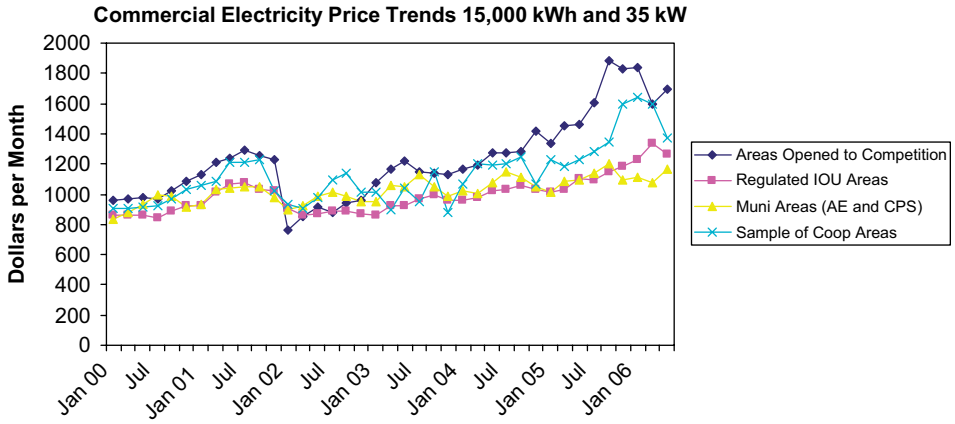


Fig. 5.

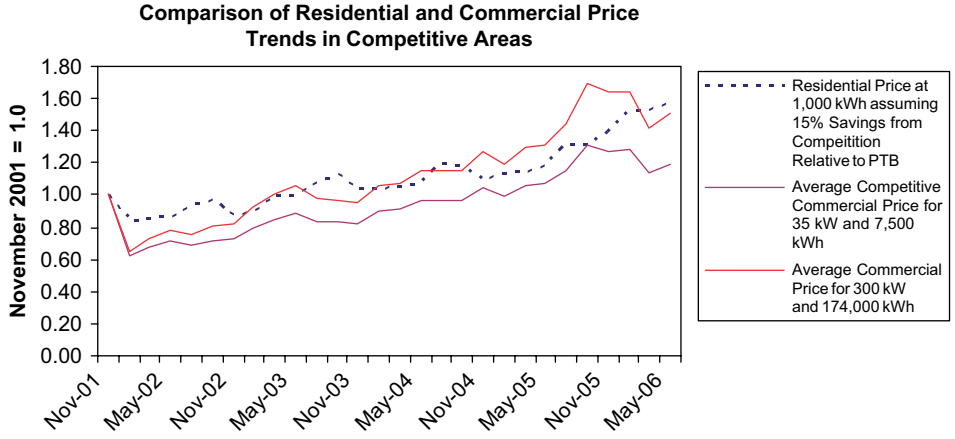


Fig. 6.

As noted earlier, the estimated coefficient on the binary variable denoting the presence of the PTB as the only price which could be charged by an incumbent provider was positive and significantly differs from zero, suggesting that allowing some pricing flexibility by these providers tended to lower the prices offered by competitors. Chow tests for structural changes also provided results consistent with the notion that there was a significant change in pricing behavior by competitive retailers when the REP affiliated with the traditional utility provider was permitted pricing flexibility.

## 5. Discussion

Prior to undertaking this analysis, we expected to find that the rise in commercial electricity prices following restructuring has less than the rise in residential rates. This result was expected because the competition for commercial customers is much greater than the competition for residential or domestic consumers (in light of the higher transactions costs and marketing costs associated with the residential sector), and commercial energy consumers often benefit from load aggregation programs. However, our analysis suggests that price trends for residential and commercial energy consumers have differed little (as per Fig. 6).

Commercial electricity prices have generally increased more in the areas opened to competition than in the areas of Texas which have not introduced customer choice. This is not surprising in light of the rise in natural gas prices in the years since retail competition was introduced. Prices in the areas opened to competition bear a close relationship to marginal generation costs, which are greatly affected by natural gas costs in Texas. In the areas not opened to retail competition, the fuel component of rates tends to reflect the weighted average cost of all fuel and generation sources used by the utility, and natural gas price increases have been greater than increases in this average. Had natural gas prices declined during this period, electricity prices in competitive areas might have declined relative to the prices realized in areas not opened to competition. Further, some of the IOUs not affected by retail choice were affected by various rate freezes in recent years, accounting for some of the gap.

Allowing the REP affiliated with the traditional utility provider with some pricing flexibility appears to lower competitive prices. In Texas, the REP affiliated with the incumbent provider was only able to offer a regulated price

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until competitors attained a foothold. Once the incumbent lost sufficient market share, it was permitted to compete on the basis of price. It appears as though this policy strategy has proven successful.

The removal of the PTB retail price caps at the start of 2007 appears to have had no near-term adverse consequences on rates. Because the expiration of the price caps coincided with the start of a session of the Texas Legislature in which electric utility restructuring will be a prominent issue, any price increases would have been met with a swift punitive response from state policymakers. In addition, natural gas prices were on a downward trend as the PTB expired, providing further pressure for price decreases.

What will happen to future commercial prices in the areas of Texas opened to competition? In the near term, prices will decline as long as natural gas prices continue to decline. However, it is unclear how ERCOT's transition to a nodal or "LMP" wholesale market in 2009 will impact future retail prices. And it is unclear how other pending policy changes may affect future prices. A variety of proposals to reduce the wholesale market power of certain power generators, to relax wholesale price caps, and to encourage greater demand response are presently under study.

## References

Adib, P., Zarnikau, J., 2006. Texas: the most robust competitive market in North America. In: Sioshansi, F.P., Pfaffenberger, W. (Eds.), Electricity Market Reform: An International Perspective. Elsevier, New York.

Apt, J., 2005. Competition has not lowered us industrial electricity prices. The Electricity Journal 18 (2), 52–61.

Axelrod, H., DeRamus, D., Cain, C., 2006. The Fallacy of High Prices. Public Utilities Fortnightly, November.

Brattle Group, 2006. Understanding utility cost drivers and challenges ahead. AESP Pricing Conference. Chicago. May 17.

Center for Advancement of Energy Markets, 2003. Retail Energy Deregulation Index, March 2003.

Johnson, D.C., 2006. Competitive Era Fails to Shrink Electric Bills. NY Times, October 15.

Joskow, P., 2006. Markets for power in the US: an interim assessment. The Energy Journal 27 (1), 1–36.

Public Utility Regulatory Act. (Texas) Various sections.

PUCT, 2006. Electricity pricing in competitive retail markets in Texas. Reply to Regulated Industries Committee of the Texas House of Representatives, February 3.

Rose, K., Meeusen, K., 2005. Performance review of electric power markets: update and perspective. Report for the Virginia State Corporation Commission.

Sioshansi, F.P., 2007. US electricity market: is it broke and can it get fixed? EEnergy Informer 18 (1).

Smith, R., 2006. In Texas deregulation, top company is a big winner. Wall Street Journal, October 27.

Spinner, H., 2006. A response to two recent studies that purport to calculate electric utility restructuring benefits captured by consumers. The Electricity Journal, Jan./Feb.

Varrionuevo, A., 2007. Generating anger: soaring utility prices bring call to re-examine regulation. NY Times, February 17.

Wilder, F., 2006. Overrated: the high costs of electricity deregulation. Texas Observer, June 30.

Zarnikau, J., Whitworth, D., 2005. Has electric utility restructuring led to lower electricity prices for residential consumers in Texas? Energy Policy.

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