Extreme Contract Variety After Deregulation:
Electricity Retail Choice in Texas

Wade Davis, Yale University, School of the Environment
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Background

- **The residential electricity retail choice market in Texas:** consumers must choose their electricity retailer and contract. There is no default
- 16 other states also have some form of retail choice. Texas is unique in having required monopoly utilities to exit the retail market
- **Retailers can compete on:** prices, costs (negotiating with generators), customer service, and contract features
- There are now over 40 retailers in Texas, up from about 10 between 2002 and 2010, and the state-run marketplace *powertochoose.com* usually features over 200 contracts

Research Questions

1. How successfully do residential consumers choose cost-minimizing contracts?
2. Electricity retailers in Texas offer much more contract variety than in monopoly settings. But what is the degree of heterogeneity in consumer preferences across contract features?

Motivation

Why study the Texas retail choice market?

- Electricity prices affect consumer welfare
- 28% of U.S. emissions are from electricity generation, so there may be benefits from more frequent and accurate price signals
- Contribute to the literatures on deregulation and consumer decision-making (e.g., Hortaçsu et al. 2017)

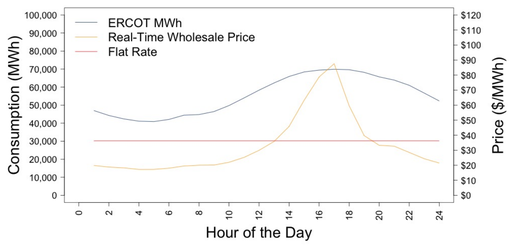

Figure 1: ERCOT load and price curves compared to a hypothetical flat rate on a hot day in August 2018.

Data

Random sample of 5,000 customers at Retailer A:

- Were customers at any point between January 2017 and August 2019
- Contract choices, monthly bills, and smart meter interval data

Retailer A contract database:

- Is a contract $c_{n,t}$ in a customer's choice set?
- Most customers have 40-50 Retailer A contracts in their choice set in each period
- If a contract ends, retailers switch customers onto another month-to-month contract

Model

Each consumer chooses the sequence of contracts $(c_{n,t})_{t=1}^{T}$ to minimize the expected discounted sum of bills:

$$\min_{(c_{n,t})_{t=1}^{T}} E_{t=1}\Big[\sum_{t=1}^{T}\beta^t c_{n,t}(q_t)\Big] \quad \text{such that:}$$

1) $c_{n,t} = c_{n,t-1}$ if $c_{n,t-1}$ ends in period t or later;
2) $c_{n,t} \in \{c_{n,t} : t = t, n \in N_t\}$ if otherwise,

- where subscript n denotes contract type (brand-duration), and t denotes the period
- q_t is the consumer's electricity consumption in period t
- $c_{n,t}(q_t)$ is the consumer's bill in billing period t
- N_t is the set of contracts offered in period t
- β is a discount factor

Strategy: Adjust modeling assumptions and exploit richness of the data to explore behavioral rationalizations for consumers' deviations from their cost-minimizing contract sequences: (1) discounting, (2) uncertainty, (3) risk aversion, and (4) preferences for green contracts or other features

Results

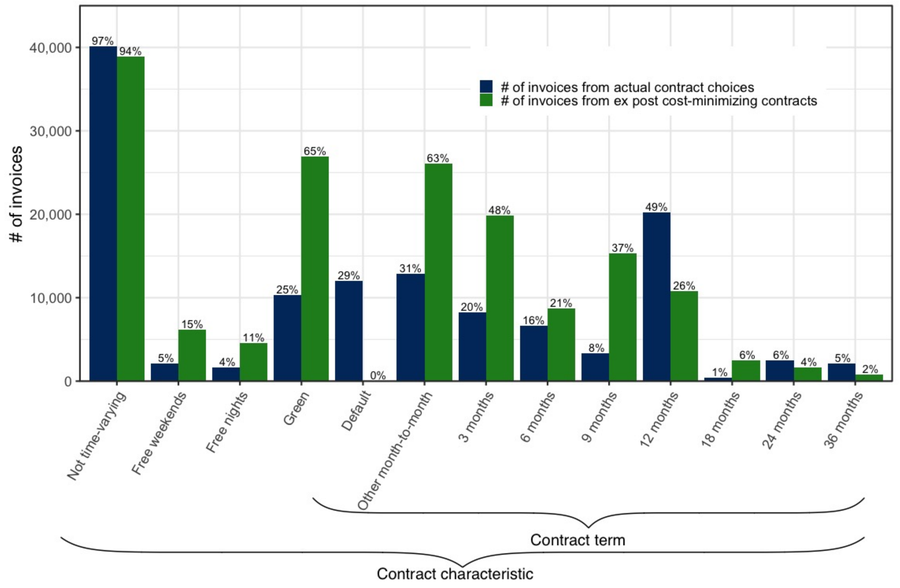

Figure 2: (1) Blue bars indicate consumers' actual contract choices, while green bars indicate model estimates of their ex post cost-minimizing contracts. (2) These results assume consumers had perfect information, which is equivalent to the ex post analysis. I also assume no discounting of the future. (3) Bars are not mutually exclusive because contracts may have multiple features and consumers may have been with Retailer A long enough to select multiple successive contracts. (4) The percentage labels on each bar indicate the share of consumers experiencing each contract characteristic.

		(1) Ex post optimal, β=1	(2) Ex post optimal, β=0.95	(3) Imperfect information optimal, β=1
[1]	Mean monthly savings	\$33* (\$16.47)	\$33* (\$16.47)	\$32* (\$15.98)
[2]	Mean discounted savings (at a monthly rate)	\$32	\$32	\$31
[3]	Share of invoices that are strictly dominated	75%	75%	75%
[4]	Share of customers for whom all invoices are strictly dominated	32%	32%	34%

Table 1: (1) This table shows the potential savings if consumers had chosen their cost-minimizing contract sequences. (2) Column 1 assumes consumers had perfect information as in Figure 2. (3) Column 2 introduces discounting. (4) Column 3 introduces imperfect information where consumers choose cost-minimizing contracts believing that their choice set will remain the same in the future. (5) Standard errors in parentheses. (6) *$p < 0.1$. (7) Means are taken across consumers, not invoices.

- Consumers choose a variety of contracts. No particular set of contract features is dominant
- Under the strong assumption of perfect information, the mean consumer saves \$33 per month, 38% of total bill and 65% of retailer portion
- Results are very robust to alternative modeling assumptions and subsets of the data. This suggests that consumers' failure to cost-minimize is best explained by a combination of search costs and inattention

Conclusions

- Policies that enable concierge services or otherwise reduce search costs could improve welfare and increase time-varying rate adoption
- Consumers in monopoly settings may be constrained in expressing their contract preferences

Future Work

- Model supply-side and equilibrium response. Seek to better explain the high number of retailers and contracts