THE OHIO STATE UNIVERSITY
JOHN GLENN COLLEGE OF PUBLIC AFFAIRS

Watt We Say or What We Do:

What do consumers really want in retail energy?

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January 5, 2026

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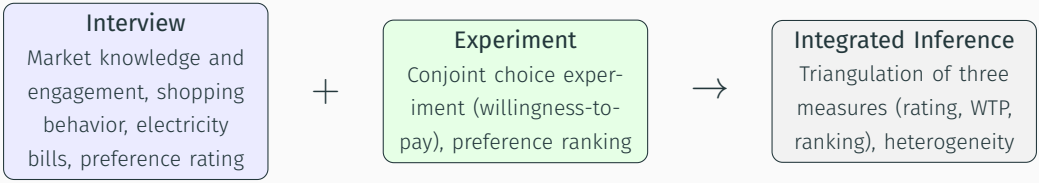
Overview

- Retail restructuring ("deregulation"): **Ohio** and **Pennsylvania** can choose electricity suppliers
- Policy goal: competition → lower prices, better options
- **Hypothesis:** CRES participation reflects higher informational engagement, leading to greater consistency between stated preferences and willingness-to-pay compared to SSO customers
- **This Paper:**



Note: This research was supported by the Alfred P. Sloan Foundation

Data

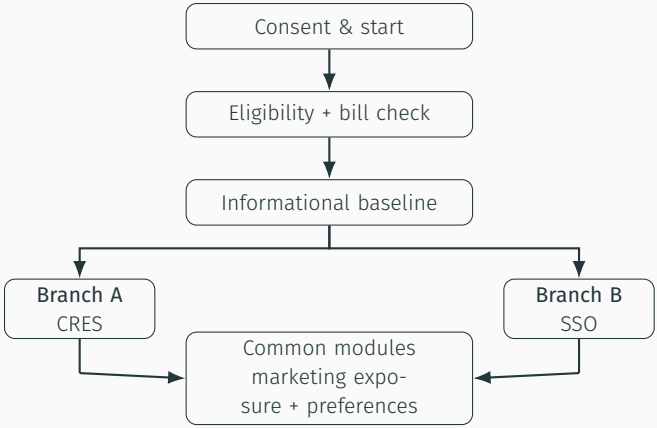
Interview

Overview

- Understand decisions of **CRES** and **SSO** customers in OH and PA ($\approx$ 400)
- Semi-structured Zoom interview
- Verified a recent electricity bill

Informational baseline

- Experience and awareness with CRES
- Frequency of reviewing electricity bills; shopping and comparing electricity offers
- Switching behavior between suppliers
- Knowledge of current price and PTC



Conjoint Experiment

	OFFER A	OFFER B
Price (cents/kWh)	9.32	6.42
Fixed/ Variable	Fixed	Variable
Contract Length (month)	12	24
Early Termination Fee ($)	0	0
Monthly Fee ($)	0	0
One-time Incentives	$ 75 cash back	$ 75 cash back
Ongoing Incentives	0	1% cash back
Renewable Sources (%)	100%	100%

1	2	3	4	5	6	7
Definitely prefer A	Strongly prefer A	Slightly prefer A	No neutral	Slightly prefer B	Strongly prefer B	Definitely prefer B

Note: Each conjoint choice task was followed by a ranking question. The experiment consisted of 22 total rounds, including duplicated choice tasks intended for data-quality checks. These duplicate tasks are not yet incorporated into the analysis presented here.

Methods

Ordered Logit Model: Attribute Differences (B − A)

In task t, respondent i compares A/B; Observed response $Y_{it} \in \{1, \dots, 7\}$ increases with preference for B

$$\underbrace{Y_{it}^*}_{\substack{\text{latent preference} \\ \text{for B over A}}} = \Delta \mathbf{x}_{it}'\beta + u_i + \varepsilon_{it}, \qquad \varepsilon_{it} \sim \text{Logistic}(0, 1)$$

Y_{it} is an ordinal discretization of Y_{it}^* via thresholds $\tau_1 < \cdots < \tau_6$

Differences (B − A)

$$\Delta \mathbf{x}_{it} = \left(x_{\text{renew}}^{(B)} - x_{\text{renew}}^{(A)},\ x_{\text{type}}^{(B)} - x_{\text{type}}^{(A)}, \dots\right)$$

β_j	Interpretation
> 0	attribute j increases preference for B over A
< 0	attribute j increases preference for A over B

Ordered logit

$$\eta_{it} = \Delta \mathbf{x}_{it}'\beta + u_i$$

$$\Pr(Y_{it} \le k) = \text{logit}^{-1}(\tau_k - \eta_{it}), \quad k = 1, \dots, 6$$

- $\tau_1 < \cdots < \tau_6$: cutpoints on latent scale
- u_i: respondent-specific baseline tendency

Willingness-to-Pay (WTP) from the Ordered Logit Model

Latent preference index

$$Y_{it}^{*} = \beta_{\text{price}}\,\Delta\text{Price}_{it} + \beta_m\,\Delta x_{mit} + \cdots$$

$$\text{WTP}_m = -\frac{\beta_m}{\beta_{\text{price}}}$$

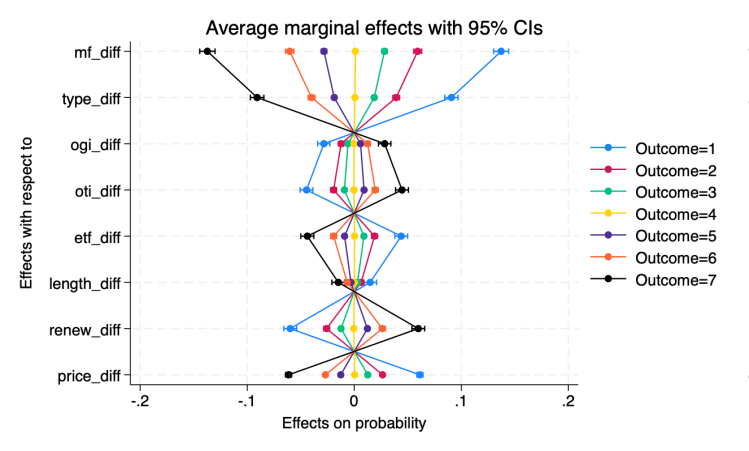
Interpretation

β_{price}	Price coefficient
β_m	Attribute m coefficient
WTP_m	Amount of money that offsets a unit change in attribute m

Note: WTP is expressed in the same units as the price attribute (cent)

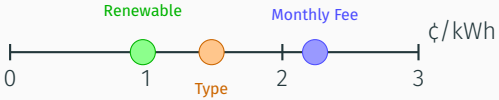
Preliminary Results (N=372)

Estimated Willingness-to-Pay Results



Attribute	WTP
Early termination fee	-0.7149954
Length	-0.2425032
One-time Incentive	0.7273907
Ongoing Incentive	0.4632421
Type	-1.480109
Renewable Energy	0.9756016
Monthly Fee	-2.23806

Estimated Willingness-to-Pay Results (continued)



- **Monthly Fee:** A **2.24 ¢/kWh discount** is required to accept a $9.99 monthly fee
- **Contract Type:** A **1.48 ¢/kWh discount** is required to accept variable rates
- **Renewable Energy:** Consumers are willing to pay **0.98 ¢/kWh** more for 100% renewables

Contract Type: Price–Type Tradeoff Tests

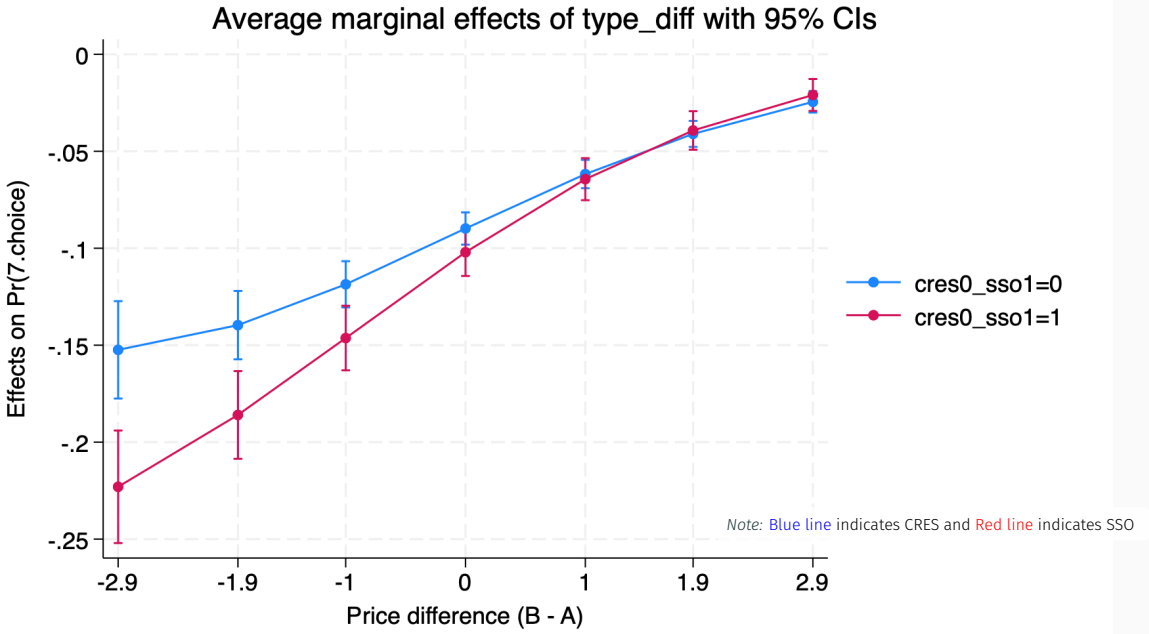
Model (shorthand):

$$\eta_{ir} = \cdots + \beta_{pr}(\text{price} \times \text{type}) + \beta_{prg}(\text{price} \times \text{type} \times G), \quad G \in \{\text{CRES/SSO, income, usage}\}$$

LR tests (nested):

- 2-way (average tradeoff): `price + type` vs. `price#type` → Significant (p=0.0347)
- 3-way (heterogeneity): `price#type + G` vs. `price#type#G`

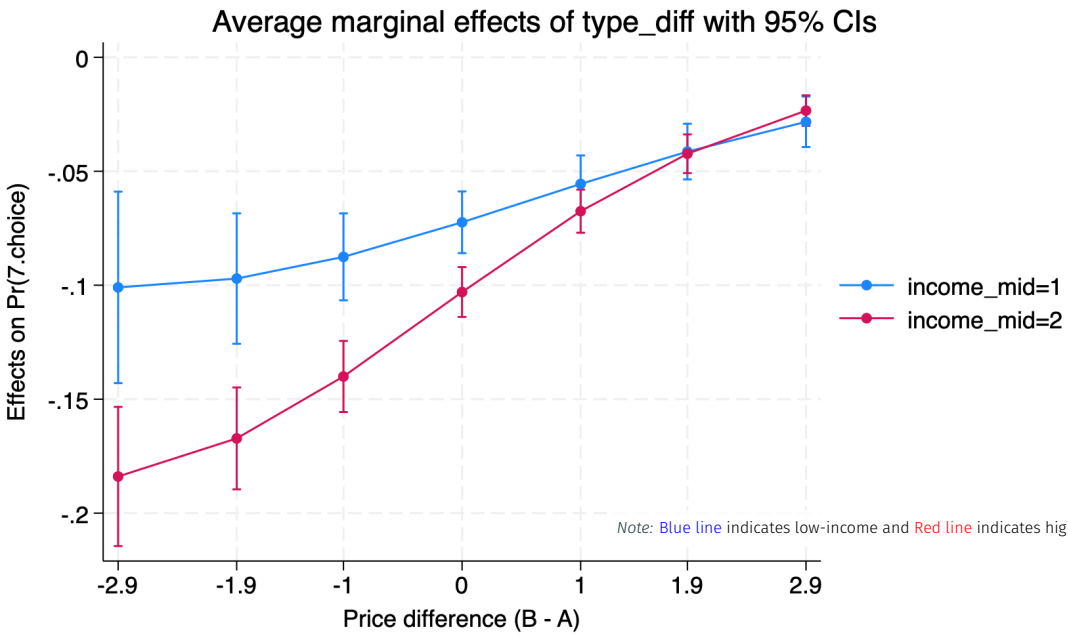
Group G	LR test p-value	Significant
CRES/SSO	0.0000	Yes
Income	0.0000	Yes
Usage	0.2077	No


Average marginal effects of type_diff with 95% CIs
Effects on Pr(7.choice)
0
-.05
-.1
-.15
-.2
-.25
-2.9
-1.9
-1
0
1
1.9
2.9
Price difference (B - A)
cres0_sso1=0
cres0_sso1=1
Note: Blue line indicates CRES and Red line indicates SSO

Example: Why Contract Type Matters Most When Price Is Attractive

	CRES Customers	SSO Customers
Option A (baseline)	Fixed rate, 10 ¢/kWh	Fixed rate, 10 ¢/kWh
Option B (cheaper than A)	Variable rate, 9 ¢/kWh *Penalty present*	Variable rate, 9 ¢/kWh *Larger penalty*
Option B (much cheaper than A)	Variable rate, 7 ¢/kWh *Larger penalty*	Variable rate, 7 ¢/kWh *Largest penalty*

Interpretation: Contract risk has the strongest discouraging effect when an option is otherwise financially attractive. SSO customers experience a larger penalty at (almost) every price difference.


Average marginal effects of type_diff with 95% CIs
Effects on Pr(7.choice)
0
-.05
-.1
-.15
-.2
-2.9
-1.9
-1
0
1
1.9
2.9
Price difference (B - A)
income_mid=1
income_mid=2
Note: Blue line indicates low-income and Red line indicates high-income

Renewbale Energy: Price–Renewable Tradeoff Tests

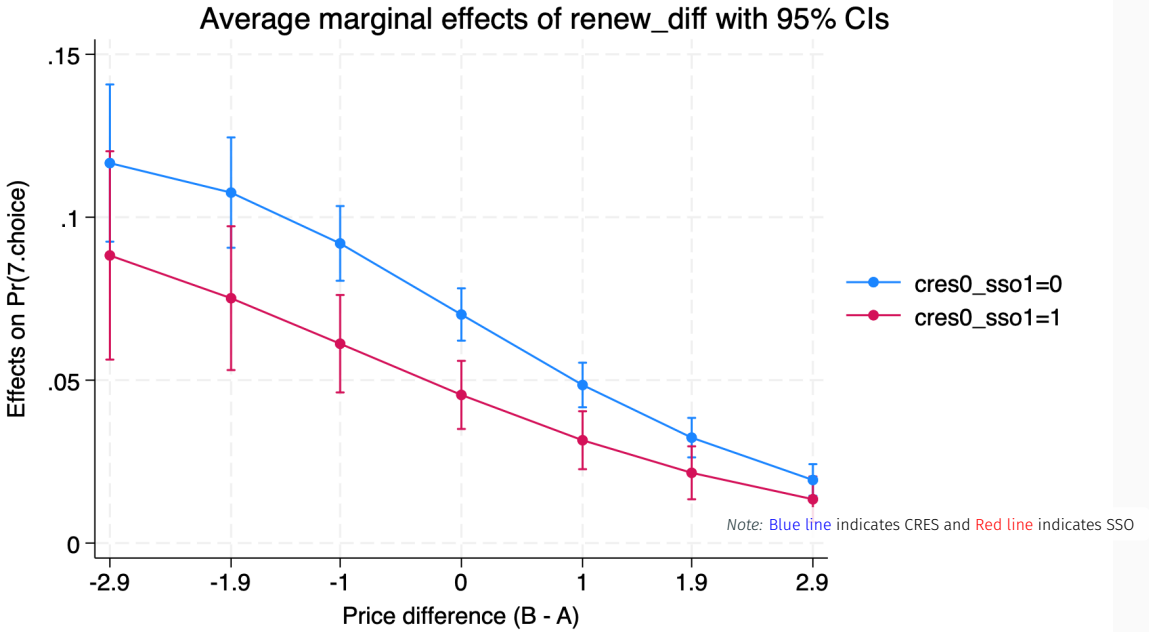
Model (shorthand):

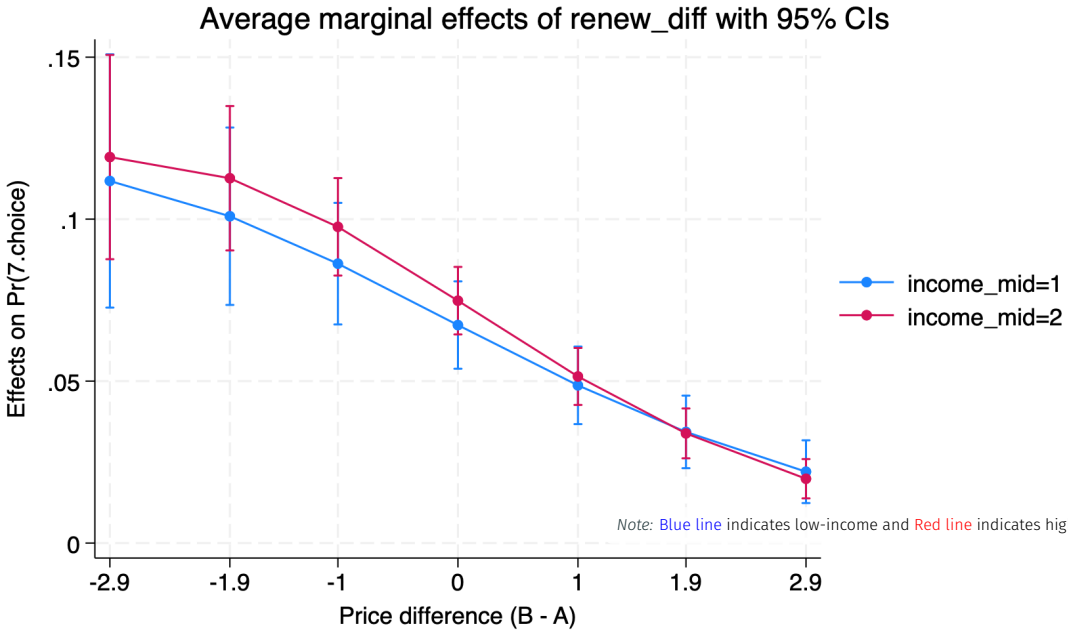
$$\eta_{ir} = \cdots + \beta_{pr}(\text{price} \times \text{renew}) + \beta_{prg}(\text{price} \times \text{renew} \times G), \quad G \in \{\text{CRES/SSO, income, usage}\}$$

LR tests (nested):

- 2-way (average tradeoff): `price + renew` vs. `price#renew` → Insignificant (p=0.7763)
- 3-way (heterogeneity): `price#renew + G` vs. `price#renew#G`

Group G	LR test p-value	Significant
CRES/SSO	0.0000	Yes
Income	0.0013	Yes
Usage	0.3030	No


Average marginal effects of renew_diff with 95% CIs
Effects on Pr(7.choice)
.15
.1
.05
0
-2.9
-1.9
-1
0
1
1.9
2.9
Price difference (B - A)
cres0_sso1=0
cres0_sso1=1
Note: Blue line indicates CRES and Red line indicates SSO


Average marginal effects of renew_diff with 95% CIs
Effects on Pr(7.choice)
.15
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.05
0
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Price difference (B - A)
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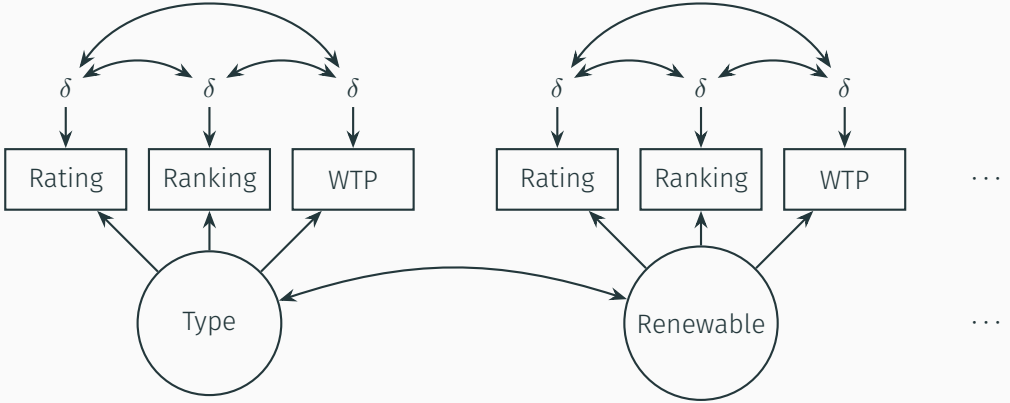
Triangulation of Three Methods - In progress



- Confirmatory Factor Analysis (CFA) Multitrait–Multimethod (MTMM)
- Correlated Uniqueness (CU) model separates trait from method-related covariance
  - Residuals are allowed to correlate within methods (Rating, Ranking, WTP)

Implications

- **Contract risk dominates price incentives:** Variable-rate contracts and monthly fees require large price discounts to be accepted, even when offers are otherwise attractive
- **Information and engagement matter:** CRES customers internalize price–risk (type) tradeoffs less sensitively $\Rightarrow$ More consistent preference?
- **Income heterogeneity in preferences:** Higher-income households are more sensitive to contract type (fixed vs. variable) and exhibit higher willingness to pay for renewable energy

Thank You

Additional Slides