

# The Price Elasticity of AI Demand

## Question

How elastic is consumer demand for AI subscriptions?

## Setting

Chicago levies the Personal Property Lease Transaction Tax (PPLTT) on cloud software, including AI subscriptions. No other major US city does this. The rate increased twice:

Date	Rate	Change
Pre-2025	9%	—
January 2025	11%	+2pp
January 2026	15%	+4pp

Anthropic passes through the tax in full. OpenAI pass-through needs verification.

## Identification

Difference-in-differences comparing AI subscription churn in Chicago versus surrounding suburbs.

**Treatment:** Chicago ZIP3s (606, 608)

**Control:** Suburban Cook County and collar counties (600–605, 607)

**Unit:** Individual cardholder  $\times$  month

**Outcome:** Churn (no AI subscription transaction for  $k$  consecutive months after prior subscription)

## Specification

$$\text{Churn}_{it} = \beta_1(\text{Chicago}_i \times \text{Post2025}_t) + \beta_2(\text{Chicago}_i \times \text{Post2026}_t) + \gamma_i + \delta_t + \epsilon_{it} \quad (1)$$

$\gamma_i$  = cardholder fixed effects

$\delta_t$  = month fixed effects

$\beta_1$  identifies the effect of the 2pp increase;  $\beta_2$  identifies the cumulative effect through the 4pp increase.

## Data

Individual-level credit and debit card panel. Can isolate transactions to OpenAI, Anthropic, and related AI merchants. ZIP3 geography links cardholders to Chicago vs. suburbs.

## Contribution

First causal estimate of the price elasticity of demand for AI tools.

## What Could Kill This

1. **Sample size.** Fewer than 500 Chicago AI subscribers pre-2025 means too little power.
2. **No pass-through.** If OpenAI absorbs the tax, only Anthropic users are treated—smaller sample.
3. **Pre-trends.** If Chicago and suburban churn rates were already diverging before January 2025, the DiD is contaminated.
4. **Billing avoidance.** If Chicago users switch billing addresses to suburbs, true treatment effect is attenuated.

## Extensions (If Core Works)

- Heterogeneity by income (proxy: total card spend)
- Heterogeneity by self-employment (proxy: business-related spending)
- Welfare calculation using external productivity estimates

These are gravy. The elasticity is the contribution.