Chicago PPLTT and ChatGPT Subscriptions

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1 Background

Chicago's Personal Property Lease Transaction Tax (PPLTT) applies to AI subscription services including ChatGPT Plus. The tax rate increased from 9% (October 2023) to 11% (January 2025).

2 Pass-Through Evidence

Figure ?? shows the median transaction amount for ChatGPT subscriptions in Chicago (zip3 606). The base ChatGPT Plus price is $20/month. Full pass-through would imply prices of $21.80 at 9% and $22.20 at 11%.
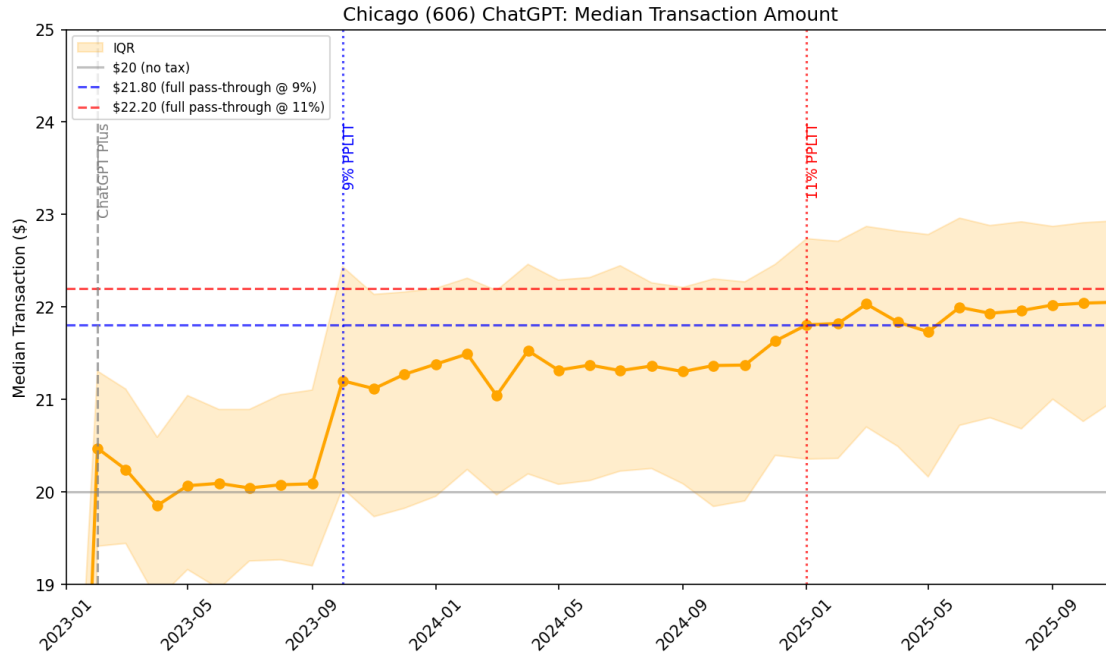

Figure 1: Median transaction amount for ChatGPT subscriptions in Chicago (full sample). Horizontal lines indicate expected prices under full pass-through. The IQR band shows the 25th–75th percentile range.

Observed median prices are slightly below full pass-through ($21.36 vs $21.80 during the 9% period; $21.95 vs $22.20 during the 11% period), suggesting pass-through is high but not complete.

3 Quantity Effects

3.1 Raw Time Series

Figure **??** compares log transactions in Chicago to the simple mean of 93 size-matched control zip3s. Controls are selected as zip3s with transaction counts within 50% of Chicago's count during January–June 2023.
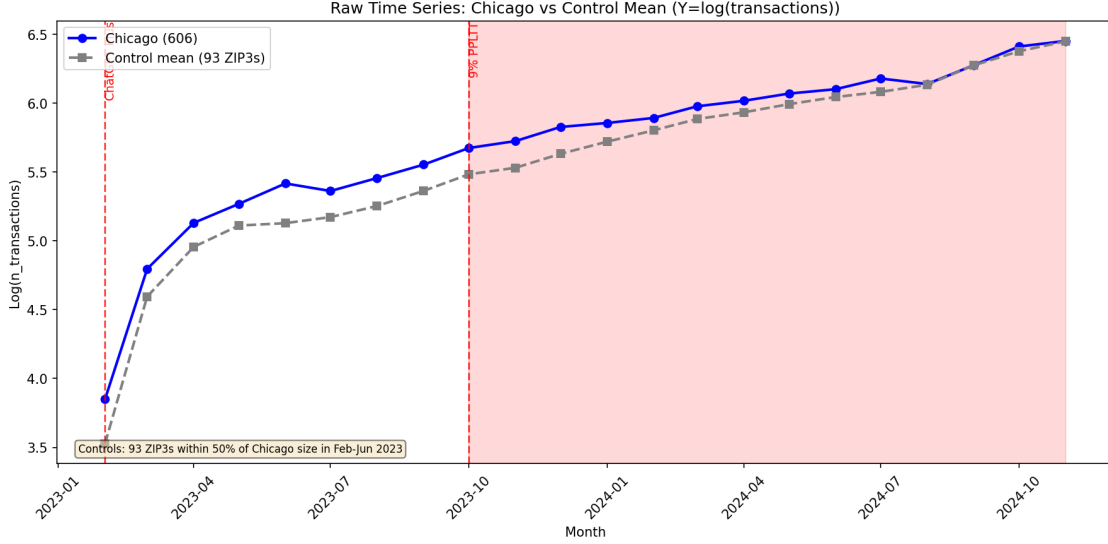

Figure 2: Raw time series of log transactions: Chicago vs. mean of 93 size-matched control zip3s.

3.2 Event Study

We do two specifications, one with all transacitons, and one that restricts to transactions between $20–22, which isolates ChatGPT Plus subscriptions ($20 base price plus tax variation). This excludes API usage and other transaction types, which drops about 55% of transactions and 58% of dollars spent. The sample runs from February 2023 (ChatGPT Plus launch) through November 2024 (before ChatGPT Pro launch in December 2024).

Figure **??** presents event study estimates from a difference-in-differences specification:

$$\log(\text{transactions}_{zt}) = \sum_{\tau \neq \text{Sep 2023}} \beta_\tau \cdot \mathbf{1}[\text{Chicago}] \cdot \mathbf{1}[\text{month} = \tau] + \alpha_z + \gamma_t + \varepsilon_{zt}$$

Standard errors are clustered at the zip3 level.

4 Discussion

The evidence suggests:

1. Pass-through is high but slightly incomplete

2. Quantity declined relative to controls, with the effect growing at higher tax rates

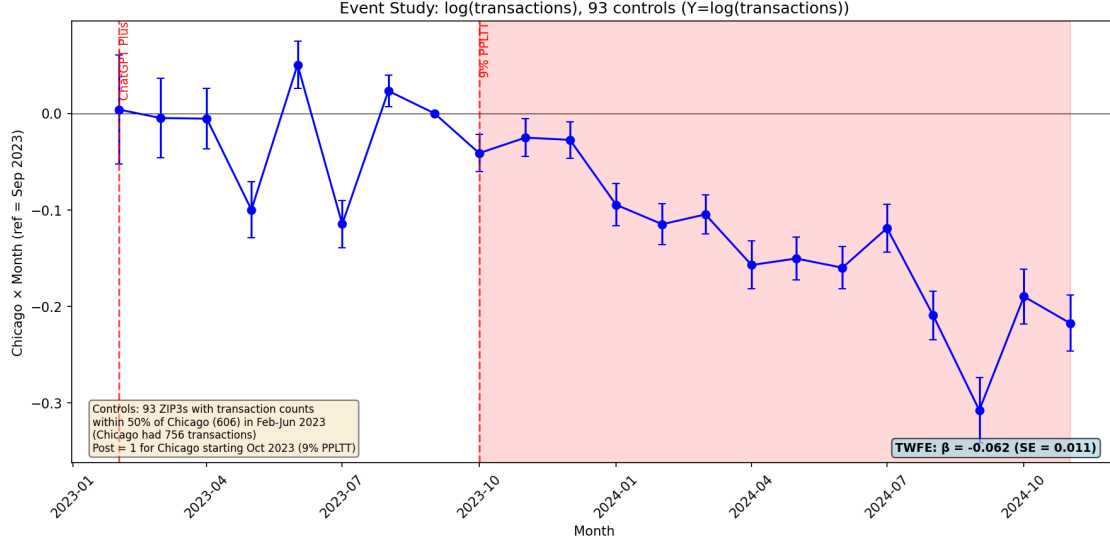3. Implied elasticity is around -1 if we believe these estimates

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Figure 3: Event study coefficients for Chicago relative to 93 size-matched control zip3s. Reference period is September 2023. Error bars show 95% confidence intervals. Light red shading indicates the 9% tax period; darker red indicates 11%.

Elasticity interpretation. We observe transaction prices in all zip3s but do not know the underlying tax rates. The elasticity calculation uses Chicago's known tax rate (9%) as the price change, implicitly assuming control prices remained constant. If control zip3s also experienced price increases, the true elasticity would be smaller in magnitude.

Figure 4: Event study coefficients for Chicago relative to 93 size-matched control zip3s. Reference period is September 2023. Error bars show 95% confidence intervals. Light red shading indicates the 9% tax period; darker red indicates 11%.