Last meeting

Last meeting we talked about:

- Cross-selling and its causes: persistent preferences, switching costs, informational asymmetries.
- Some points Phil raised:
  1. is asymmetric information plausible? It is plausible, credit bureaus do not share transaction data nor soft information. There are papers that show that using the information gathered from app use can improve predictions. From talks with a practitioner he told me they use around 600 variables.
  2. I mentioned Egan et al. (2025), Phil said that it was important to have that paper in mind. In their model there are no switching costs, persistence is due to consumer not reoptimizing.
  3. Is there prior literature on cross-selling? There are a couple of papers (e.g. Basten et al.) but they do not use IO tools and they do not focus on competition.

This meeting (1)

Topics to discuss:

- Present model of switching costs
- How to identify the model of switching costs?
  - Dube et al. (2009)?
- Discuss prospectus advising
- Next steps considering that I still have to apply for the data

Model: Setup

Environment: Two periods $t = 1, 2$, two products (e.g., checking account $\rightarrow$ loan), J firms.

Consumer utility:

$$u_{ijt} = \beta_t - \alpha p_{ijt} + \xi_{ijt} + \epsilon_{ijt}$$

Switching cost: If consumer switches firms between periods, incurs cost s:

$$U_i(j_1, j_2) = u_{ij_1,1} + u_{ij_2,2} - s \cdot \mathbf{1}(j_1 \neq j_2)$$

Demand in period 2: Conditional on first-period choice j_1:

$$D_{2j}(j_1, p_2) = \begin{cases} \frac{\exp(\delta_{jt})}{\exp(\delta_{jt}) + \sum_{j' \neq j} \exp(\delta_{j't} - \alpha s)} & \text{if } j = j_1 \\ \frac{\exp(\delta_{jt} - \alpha s)}{\exp(\delta_{j_1 t}) + \sum_{j' \neq j_1} \exp(\delta_{j't} - \alpha s)} & \text{if } j \neq j_1 \end{cases}$$

Model: Invest-Harvest Motive

Firm j's problem in period 1:

$$\max_{p_{j1}} \underbrace{D_{1j}(p_{j1} - c_1)}_{\text{Period 1 profit}} + \sum_{k=1}^{J} D_{1k} \cdot \pi_{2j}(k)$$

FOC reveals dynamic incentives:

$$\text{MR}_{1j} + \underbrace{\frac{\partial D_{1j}}{\partial p_{j1}}}_{(-)} \left[\pi_{2j}(j) - \sum_{k \neq j} \omega_{jk}\, \pi_{2j}(k) \right] = 0$$

where ω_{jk} are diversion weights (fraction of lost customers going to k).

Key insight:

- **Harvest (Period 2):** Incumbent earns $\pi_{2j}(j) > \pi_{2j}(k)$ due to switching costs
- **Invest (Period 1):** Firm sets p_{j1} *below* static optimum to acquire customers
- Sacrifice period 1 margins $\rightarrow$ build larger customer base $\rightarrow$ extract rents in period 2

Model: Definitions

Period 2 profits $\pi_{2j}(k)$: Firm j's expected profit from consumers who chose firm k in period 1:

$$\pi_{2j}(k) = \max_p D_{2j}(k, (p, p^*_{-j2}(k)))(p - c_2)$$

- $\pi_{2j}(j)$: Profit from "own" customers (incumbent advantage due to s)
- $\pi_{2j}(k)$ for $k \neq j$: Profit from "poaching" rival's customers

Diversion weights ω_{jk}: Fraction of customers lost by firm j that go to firm k:

$$\omega_{jk} \equiv \frac{\frac{\partial D_{1k}}{\partial p_{j1}}}{-\frac{\partial D_{1j}}{\partial p_{j1}}}, \qquad k \neq j$$

- $\omega_{jk} \geq 0$ for substitutes (raising p_{j1} increases D_{1k})
- $\sum_{k \neq j} \omega_{jk} = 1$ (lost customers must go somewhere)