Seller-Side Tying of Platform Services

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Roadmap

Ancillary platform services

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Marketplaces also provide ancillary services to sellers that increase value of trade.

- Fulfillment by Amazon ($\sim$75–90% of sellers), Walmart ($\sim$66% of sellers).
- Payment system for app stores.
- Customer service.
- Insurance.
- Product photography.

Tying or bundling of services

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Competition concerns and cases:

- Amazon (Italy, US).
- Apple & Google payment systems (investigations in EU, UK, US, Korea).
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What is the impact of bundling services to sellers?

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We study seller-side tying.

- Consumers visit a platform to buy from sellers there.
- *Sellers* choose whether to buy only intermediation (A) or intermediation + ancillary service ($A + B$).
- Why would a platform want to force sellers to choose $A + B$?
- $\implies$ A new efficiency argument.
- Quite different results to consumer-side tying.

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Key idea:

- Sellers under-adopt the ancillary service (cf. Shaked & Sutton, 1982).
- Few consumers join the platform $\implies$ externality.
- Tying resolves this problem of under-adoption.
- Good for consumers, and maybe for sellers too.

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- Core service A: enabling transaction. Essential facility. Zero marginal cost.
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Consumers

- Baseline value v. Assume market is fully covered in all cases.
- Heterogenous taste for quality: $\theta\Delta$. $\theta \sim \mathcal{U}(0,1)$ (indep. across markets).
- Elastic participation with $\mathcal{U}(0,1)$ outside option.
- Remark: uniformity is dispensible.

The model - timing

1. Platform chooses whether to tie A and B. Chooses unit fees.
2. Sellers choose whether to buy B.
3. Sellers choose their prices.
4. Consumers choose whether to use the platform.
5. Consumers learn their θ and choose which seller to buy from.

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Note: Because there are many markets, participation is independent of a single seller's actions $\Rightarrow$ Sellers choose actions taking participation (Q) as given.

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If only seller 1 buys B, vertical differentiation (Shaked and Sutton, 1982).

- consumers with $\theta > \theta^*$ buy from seller 1 (AB).
- consumers with $\theta \leq \theta^*$ buy from seller 2 (A).
- $p_1 = c + f_A + \frac{2(f_B+\Delta)}{3}$, $p_2 = c + f_A + \frac{f_B+\Delta}{3}$.
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Lemma If the ancillary service is offered without tying there is asymmetric adoption of it by sellers if $f_B < 2\Delta$.

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Suppose that one seller adopts B.

Expected CS (= consumer participation):

$$Q(f_A, f_B) = \int_0^{\theta^*} (v - p_2) d\theta + \int_{\theta^*}^1 (v + \theta\Delta - p_1) d\theta.$$

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Equilibrium

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- $\Pi_{\text{tying}} = \left(\frac{v-c}{2} + \frac{\Delta-2k}{4}\right)^2$
- $\Pi_{\text{no service}} = \left(\frac{v-c}{2}\right)^2$

Proposition

- The platform never offers the ancillary service as an option.
- If $k \leq \Delta/2$, the platform ties the core and ancillary services.
- If $k > \Delta/2$, the platform does not offer the ancillary service.

Discussion

Tying and no service are more profitable than offering service without tying *despite* inducing inefficient over/under-consumption.

- Inefficiency is offset by an increase in consumer participation.
- Platform internalises the negative externality on consumers when seller competition is softened.

Ban on tying

If tying is banned:

1. Platform doesn't offer the service
   - Remark: hinges on assumption that $\theta \sim \mathcal{U}(0,1)$.
   - General point: ban can reduce incentive to offer ancilliary service.

2. Consumer surplus weakly decreases
   - Robust to non-uniform (but log-concave distributions).
   - Tying benefits consumers whenever it is profitable.

3. Seller surplus is unchanged, so 'total user surplus' falls.

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  - Break-up is harmful even without double marginalization.
  - Result holds, even if platform can impose a minimum quality requirement.

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- Overall: Consumer surplus decreases.
  - Break-up is harmful even without double marginalization.
  - Result holds, even if platform can impose a minimum quality requirement.
- But total user surplus can increase because sellers earn more profit.

Roadmap

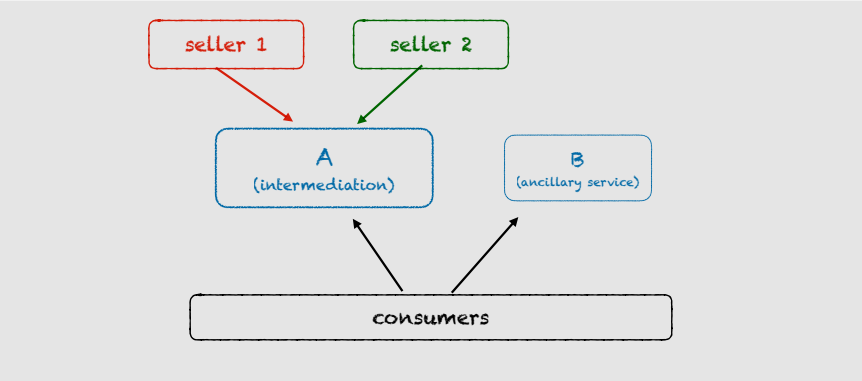
Introduction

Model

Results

Extensions and discussion

Discussion: Tying on the consumer side



- $B \not\Rightarrow$ vertical differentiation.
- Sellers compete à la Bertrand with or without tying.
- Tying not profitable with covered market ($\sim$ standard model of tying).

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But this is not a general result

- Suppose sellers are initially differentiated.
- Tying does not eliminate all market power.
- With high elasticity of participation, sellers can be better-off with tying.

We then have a situation where tying is a Pareto improvement because it resolves a competitive externality.

Other extensions in brief

Competition on B market

- Can interpret baseline as a model where a competitive fringe is efficiently foreclosed.
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- This is a static efficiency, but obvious potential for dynamic harms.

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- Give platform a reason to want high seller profit.
- Numerical analysis suggests tying never harms consumers (i.e., competition reduction effect of tying dominates).

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Two-part tariffs, i.e., fixed fee + unit fee for both services (these are optimal contracts in our model)

- Platform has enough instruments to efficiently sort consumers with unit fees and extract profit with fixed fees.
- Tying no longer profitable for platform — banning tying is neutral.

Conclusion

Simple model of marketplace provision of ancillary service, and tying on seller side.

Under-adoption of service to increases sellers' market power.

- Platform has incentives to tie ancillary and core service to increase competition among sellers — this benefits consumers as well.
- Basically, platform is better than sellers at internalising participation externalities.

Regulation like banning tying and platform break-up restores sellers' market power and harm consumers (and maybe sellers too).

Literature on tying

Rich intellectual history around tying. 3 main motives:

1. Transaction or production cost savings (e.g., operating system components);
2. Price discrimination/surplus extraction (E.g., Netflix/Spotify);
3. Leverage (e.g., MSFT/IE, Google-Android).

Literature on tying in digital markets

- Zero marginal cost (Bakos and Brynjolfson, 1999).
- Tying and data (Condorelli and Padilla, 2024).
- Steering and takeovers (Heidhues, Köster and Köszegi, 2024).
- Non-Negative Pricing Constraint (Choi and Jeon, 2021).
- Network effects (Carlton and Waldman 2002, Choi and Jeon, 2021, Choi, Jeon and Whinston; 2021).