Discussion of

Online Privacy and Information Disclosure

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How do sellers use buyers' information?

- Offer the best-matching product
  - Push demand curve up
  - Reduce elasticity of the demand curve
- Price discriminate
  - Higher prices for high value customers
  - Discounts for low value customers

I decide whether Amazon sees which news I read, and presumably this will tell Amazon which phone cases they should offer me, and Halloween costumes, and book to read, presents to buy, video to watch, …
Who benefits from letting Amazon also tailor the price for me?

This paper: I'd benefit from price discrimination (and Amazon loses)
But…
I already lost by letting Amazon know which product I would prefer; or maybe…
I already lost by letting Amazon become a monopoly?

Model components

Setting

- **Monopolist** has K horizontally differentiated products, equal production cost
- Consumer(s) random values distributed over finite values per product **i.i.d.**
- Ex-ante, **expected value of all products is the same**

Actions

- **Consumer** chooses privacy policy
- **Nature** (consumer's actions) generate a signal about preference
- Signal disclosed to **firm** based on policy
- **Firm** offers single product to consumer
- Consumer discovers his value (only) for the offered product
- **Consumer** makes purchase decision

Without price discrimination: Firm sets price **per product** without responding to the disclosure policy

With price discrimination: Firm sets price per **consumer** after observing signal

What happens without disclosure?

- Firm must offer a single product
- Can’t know which product is good match for the customer
- Demand curve (or WTP) comes from the population aggregate distribution
- i.i.d – may as well offer the same product to everyone

Full disclosure without price discrimination

- Firm uses information to determine:
  - Best match product
  - Updated demand curve for each product conditional on information quality
  - Monopoly price for the product conditional on updated demand

- Firm splits into multiple non-competing monopolies
- Each monopoly faces a “better” demand curve than the aggregate
- i.i.d – max from K draws vs. one draw

Non-discrimination economics

- Two forms of non-discrimination, price independent of
  1. Disclosure policy and
  2. Disclosed information
- Information disclosure only affects customer-product matching
- Price identical for all products
- Buyer’s best response is to get the best match - full disclosure
  - Identically priced products, prefer the most valued product

Non-discrimination observations

- Same result if only the buyer has all the information and can choose any product at equilibrium price
  - “Standard” assumption for well-operating markets (without monopoly)
  - Here “worse case scenario”
- If full disclosure is possible, it achieves optimal matching (“Horizontal efficiency”)
  - But some consumers won’t buy at the offered price
- Depends on:
  - The firm not “best-responding” to the disclosure policy; and
  - Buyer preferences i.i.d.

Price Discrimination

Information disclosure affects customer-product matching and prices

Firm adjusts prices based on the consumer's

1. Disclosure policy and
2. Actual disclosed information

Discrimination based on policy

- The firm can adjust if the buyer discloses imperfectly …
- Customer-Product match may be worse
- Worse demand curve (“usually max of K draws”)
- Consumer’s benefit from lower price may be higher than loss from worse match
  - “Intentional ignorance” in the product matching stage
- Lower price and worse matches for customers that don’t use “cookies”

Discrimination based on information

- Discount for customers that signal very low valuation
- Buyer could limit disclosure policy to only affect matching
- Disclosing additional information must reduce prices
- Strong result: If full information is possible, buyer's optimal disclosure policy guarantees trade
- Intuition:
  - Monopolist offer is deterministic given policy and disclosed information
  - If offer would be rejected, improve information to get lower price *without increasing price for existing information*

Discrimination observations

- Discrimination result holds **only if buyer can control how much information is shared**
- Can even increase total surplus (if K is small)
- Big Brother Monopoly: "Firm offers product only under full disclosure, prices at $\mathrm{p} = \mathrm{E}[v|s] - \epsilon$"
  - Increases efficiency
  - Minimal consumer surplus
  - Dystopian?
- Disclosure qualitatively different from reporting
  - Can add noise but can't misreport

Policy relevance: Protect Consumer Choice (?)

- Information can hurt consumers when facing a monopoly, should help with oligopoly
  - Corts: *Third-Degree Price Discrimination in Oligopoly: All-Out Competition and Strategic Commitment* (RJE98)
- Efficiency (at least short term) vs. consumer surplus
- Perfect matching vs. competition
  - Hospitals choosing product first and negotiating price with the one supplier
- "Strategic" recommendations to curtail competition
  - What is the market for recommendations?
- "Strategic" disclosure by consumers – feasible at reasonable cost?
  - Maybe requires "Internet Bill of Rights"/ GDPR?
  - Can't be tailored per product / seller

Summary comments

- Terrific research of a difficult and important question
- Discrimination and equilibrium based on *disclosure policy* vs. disclosed information
- Discrimination can increase total and consumer surplus
- Total vs. Consumer surplus – policy may be at odds
  - Can we identify conditions?
- Can we relax the monopoly starting point?
- "Big Brother Monopoly" maximizes total surplus (in the model)
  - "From **each according to his** ability, **to each according to his needs"**
  - **What's missing in these models?**