14.01 Microeconomics
Segment 31

Price Discrimination Online

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And by "personalized pricing," we mean 1st degree price discrimination.

We mentioned an example two segments ago---Amazon getting caught engaging in personalized pricing---that suggested that price discrimination could be easier for online retailers.

It could be easier for two reasons:

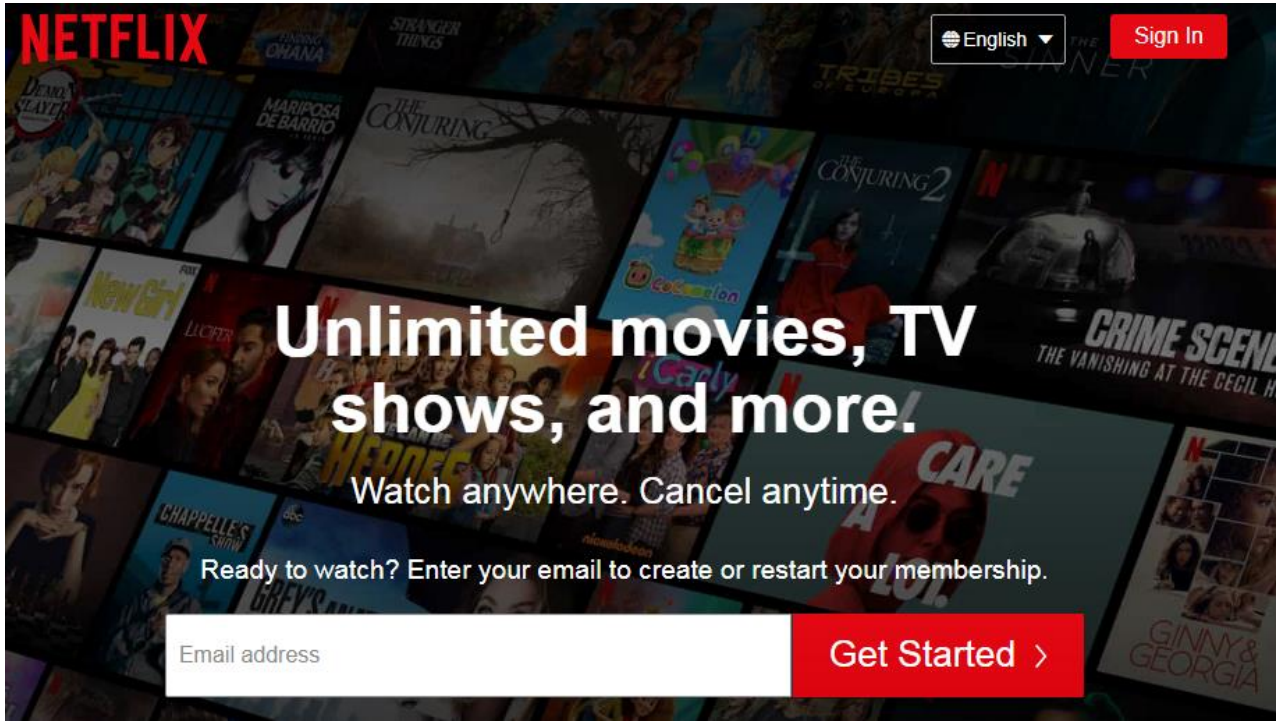
- Mechanical reason that it's easier for a website than a brick-and-mortar store to offer different prices to different customers
- Information-gathering reason, that online retailers typically have a lot of information on their customers that they could use to estimate willingness to pay

If so, it could give them an advantage over traditional retail rivals. (Recall that for 1st degree price discrimination, at least, firms can actually do better than charging monopoly prices if they can charge individualized prices to everyone.)

Let's see how this might work.

1st degree price discrimination is hard because there is a very substantial information requirement---how do firms get willingness-to-pay? Knowing customers' demographics, which online firms often do, helps, but can they do even better if they know behavior (e.g., web-browsing history)? The answer is yes.

Furthermore, how important is demographic information versus behavior in setting personalized prices? We'll see.



"First Degree Price Discrimination Using Big Data" by Ben Shiller

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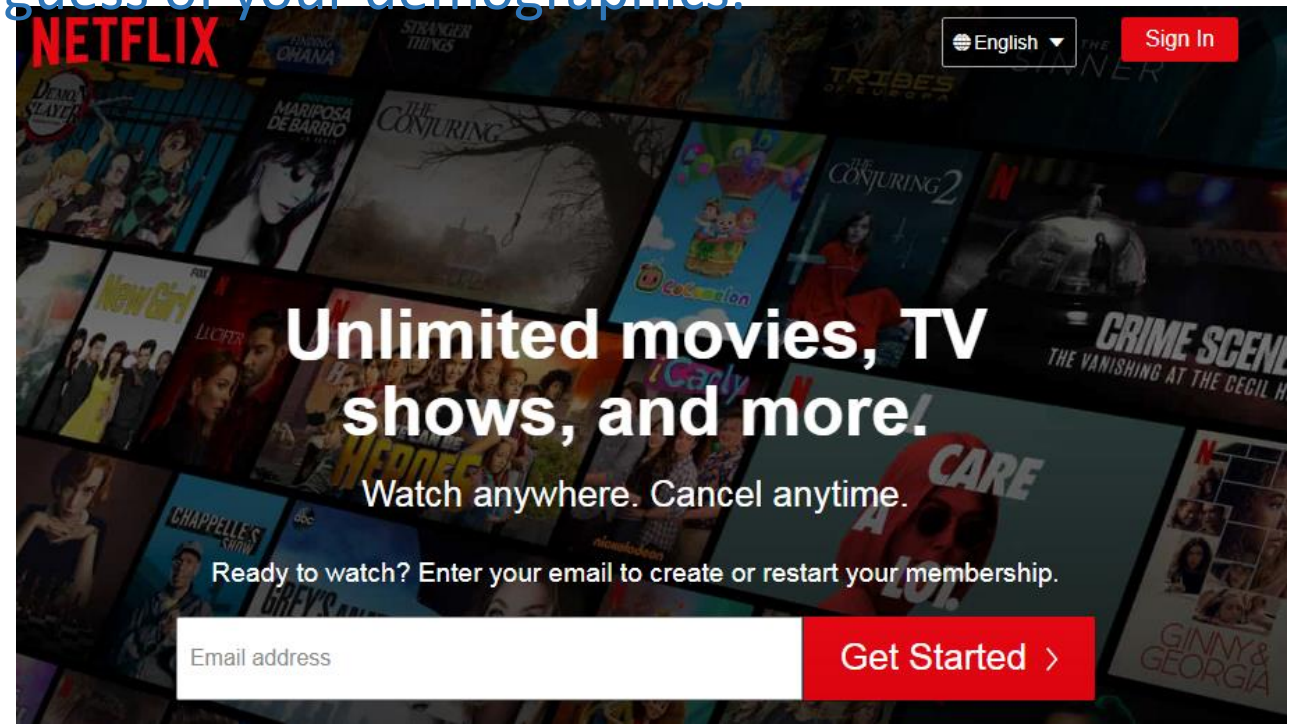
If they know your address, which they will if they're shipping you stuff, they know your census tract and can get a pretty good guess of your demographics.



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In addition to demographics, online retailers may be able to purchase "clickstream" data that has been collected on customers and potential customers: for every web-browsing session, domain name, time and duration of visit, number of pages viewed, referring website, details on transactions (and more).

That's a ton of information!

The author purchased clickstream and demographic data for a large group of internet users and made some clever realizations.

- He could infer, based on the clickstream data, which individuals were Netflix subscribers and which were not. He could even infer tier. (He did this simply by seeing how often an individual visited Netflix and which pages she went to.)
- He could then build a model of demand for Netflix services, as a function of price, demographics, and web-browsing behavior.
- He had way (way) too many variables to potentially use in the model of demand. (Some of you might recognize that such a situation calls for machine-learning techniques! That's what he did.)
- Then, with the demand model in hand, he ran simulations on different personalized pricing schemes, using just demographics, just behavior, and both.

He found

- Using data on customer demographics to personalize prices could increase profits about 1%.
- Using data on customer behavior in addition, can increase Netflix profits 12%!

Oh, so maybe that's good for consumers who want to thwart personalized pricing. You can't change your demographics easily, after all, but you can change your behavior.

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Oh, so maybe that's good for consumers who want to thwart personalized pricing. You can't change your demographics easily, after all, but you can change your behavior. Well, not so fast.

- Important behavioral variables were not the ones that consumers would think to distort to masquerade as lower types (e.g. use of Wikipedia, web-browsing on Tuesdays).

Caveats:

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I often teach a class on ecommerce. I talk a lot about issues like these in that class.

Final words about price discrimination and online retail

We noted that catalogs and, even more so, internet retail sites have lots of information on us. And, as we said, they have pretty good tools to prevent arbitrage, especially for services.

Amazon, at least, has come under intense criticism for attempted 1st and 3rd degree price discrimination. Other retailers might be able to get away with a bit more than Amazon can.

Finally, note that 2nd degree price discrimination will always be available to retailers who can manage it.