Motivation

→ online platforms focus on design of rating systems which allow information transmission between consumers; strong effect on demand
  * 82% of consumers read reviews before shopping online (EPRS, 2017)
  * one-star rating increase on Yelp → revenues 5-9% ↑ (Luca, 2016)

→ sellers incentivized to “manage” rating
  * multiple channels (product quality/service quality/…)
  * we focus on strategic pricing

→ How does the design of the rating system affect pricing incentives and consumer learning?
  * rating systems allow passing of information across periods
  * consumers observe aggregate statistics, but not all information relevant
  * characteristics of past consumers unobserved but affect review
CONTRIBUTION

Tractable framework of dynamic pricing in presence of rating systems

→ long-lived firm sells good of fixed quality to short-lived consumers
→ consumer inference based on heuristic ("quasi-stationarity")
→ interaction of pricing incentives and information transmission

Capture empirically documented relationships b/w prices & reviews

→ price ↑ ⇒ review ↓ due to direct price effect
→ price ↑ ⇒ review ↑ due to selection effect
→ strength of direct price effect product-specific
  * dominates for standardized products (USB sticks, Cabral and Li (2015))
  * selection effect dominates otherwise (e-books, Zegners (2019))
  * in line with own analysis of video games, casual vs. non-casual
Model Ingredients

→ long-lived firm sells good of fixed quality to short-lived consumers
  * \( t \in \{1, 2, \ldots, T\}, T \leq \infty \)

→ purchasing consumers leave review which depends on
  * quality (\(+\))
  * idiosyncratic taste (\(+\))
  * prices weighted by parameter (\(-\))

→ quality inference
  * based on current aggregate rating & current price
  * heuristic: assume past consumers faced same price and rating (quasi-stationary)

→ updated rating is weighted average of previous rating & average review
  * weight parameter measures sensitivity to incoming reviews
Results

Long-run properties of learning

→ consumers hold correct beliefs about quality in long-run (despite heuristic)

→ not affected by details of rating systems (*sensitivity* to new reviews)

Long-run properties of prices & consumer surplus

→ sensitivity affects long run prices & consumer surplus

* strong price effect: sensitivity ↑ ⇒ price ↓, CS ↑

* weak price effect: sensitivity ↑ ⇒ price ↑, CS ↓

→ higher sensitivity increases dynamic pricing incentives

→ strength of price effect determines direction of dynamic pricing incentives

→ policy changes by many platforms may have reduced consumer surplus

* firms always benefit as it makes reaching “target rating” less costly