

Digital Platforms – Traditional Taxonomy

E-commerce



Search / Media



Gig Economy



Payment and OS



Digital Platforms – New Taxonomy

Ads Business Model

Trust-builders



Google Play

Alipay

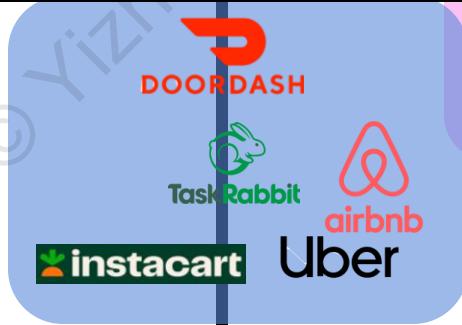
stripe

coinbase

VISA

Windows

PlayStation



DOORDASH

TaskRabbit

airbnb

instacart

Uber



amazon marketplace



淘宝 Taobao

TEMU

Zillow

tinder

LinkedIn

Google

YouTube

TikTok

Twitter

Match-makers

Transaction Business Model

What Info is Asymmetric on Digital Platforms?

Information 1: are buyers / sellers trustworthy?

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What Info is Asymmetric on Digital Platforms?

The amazing success of online marketplaces was not fully anticipated, primarily because of the hazards of anonymous trade and asymmetric information. Namely, how can strangers who have never transacted with one another, and who may be thousands of miles apart, be willing to trust each other? Trust on both sides of the market is essential for parties to be willing to transact and for a marketplace to succeed. The early success of eBay is often attributed to the innovation of introducing its famous feedback and reputation mechanism, which was adopted in one form or another by practically every other marketplace that came after eBay. These online feedback and reputation mechanisms provide a modern-day version of more ancient reputation mechanisms used in the physical marketplaces that were the medieval trade fairs of Europe (see Milgrom et al., 1990).

Can you articulate the adverse selection and moral hazard issues here?

What Info is Asymmetric on Digital Platforms?

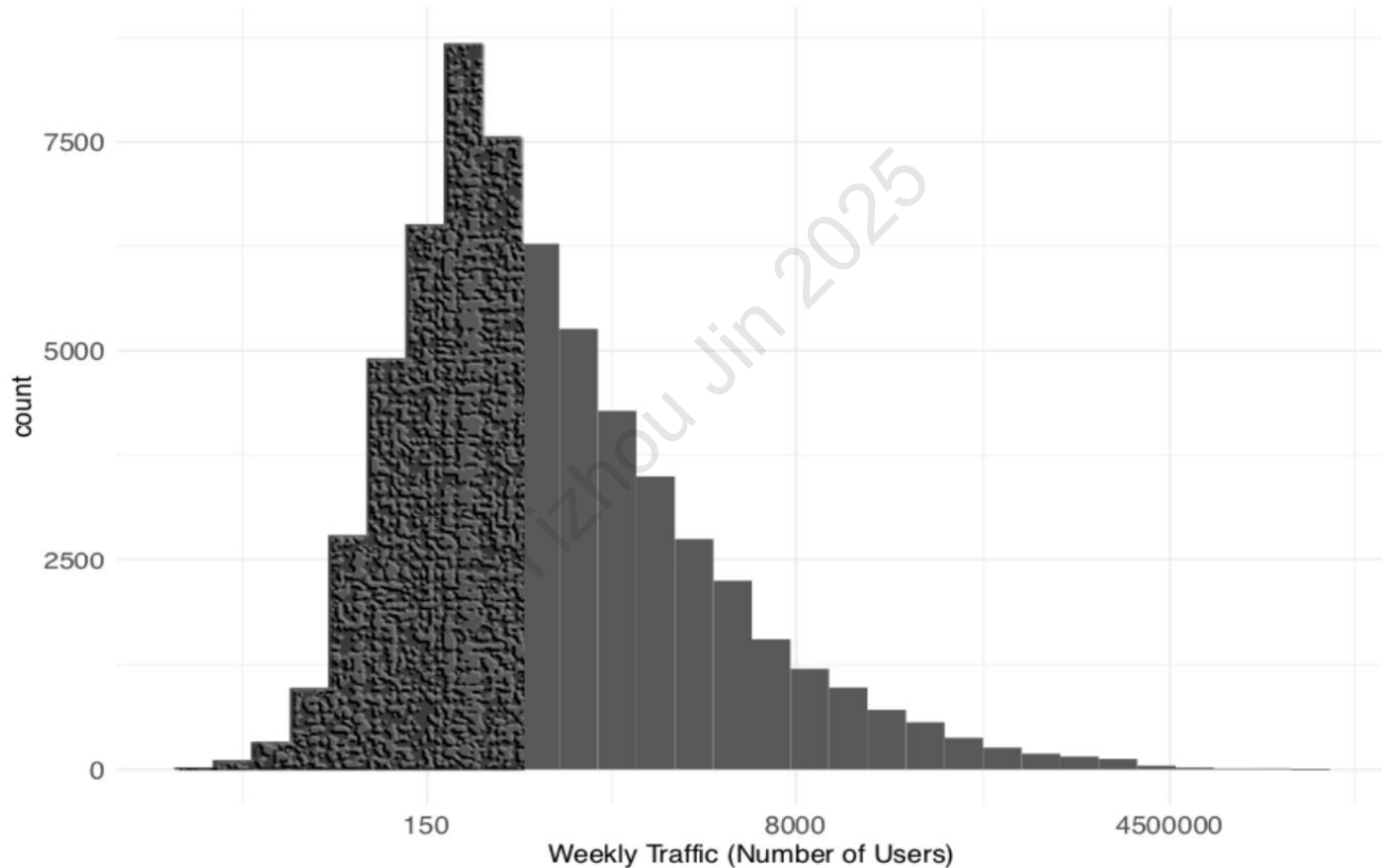
Information 2:

Does product x “match” the need of consumer y?

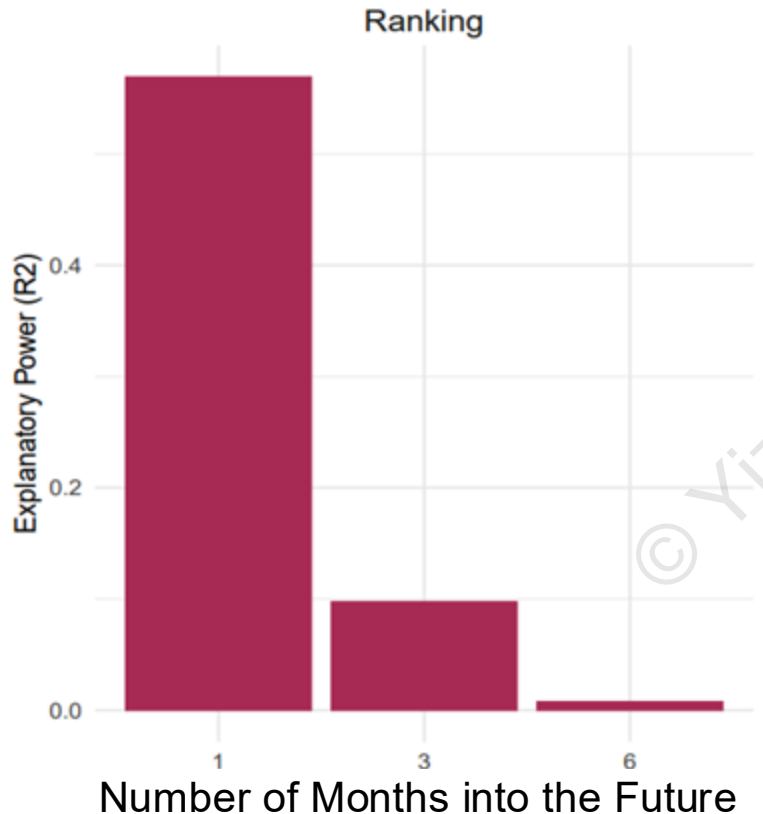
Are there better matches?

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Histogram of Seller Weekly Traffic



Sellers are Numerous and Different

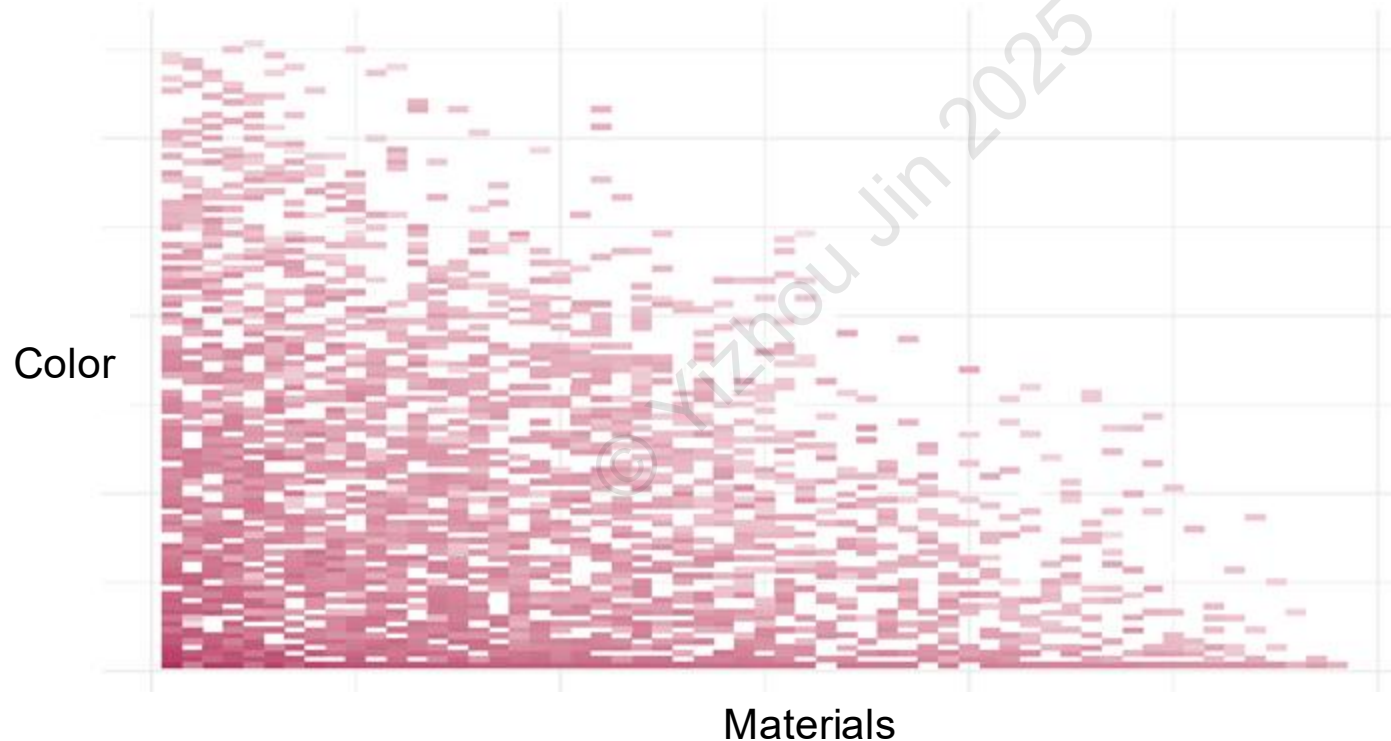


But when we tried to use ML to to predict future product ranking in each product categories.

It's almost impossible to predict ranking beyond the top position and beyond three months.

Buyers are also Numerous and Different

Sales Heat Map



Product
category:
Sweater

2020 April
Alibaba
Taobao

Color: 158
Materials: 56

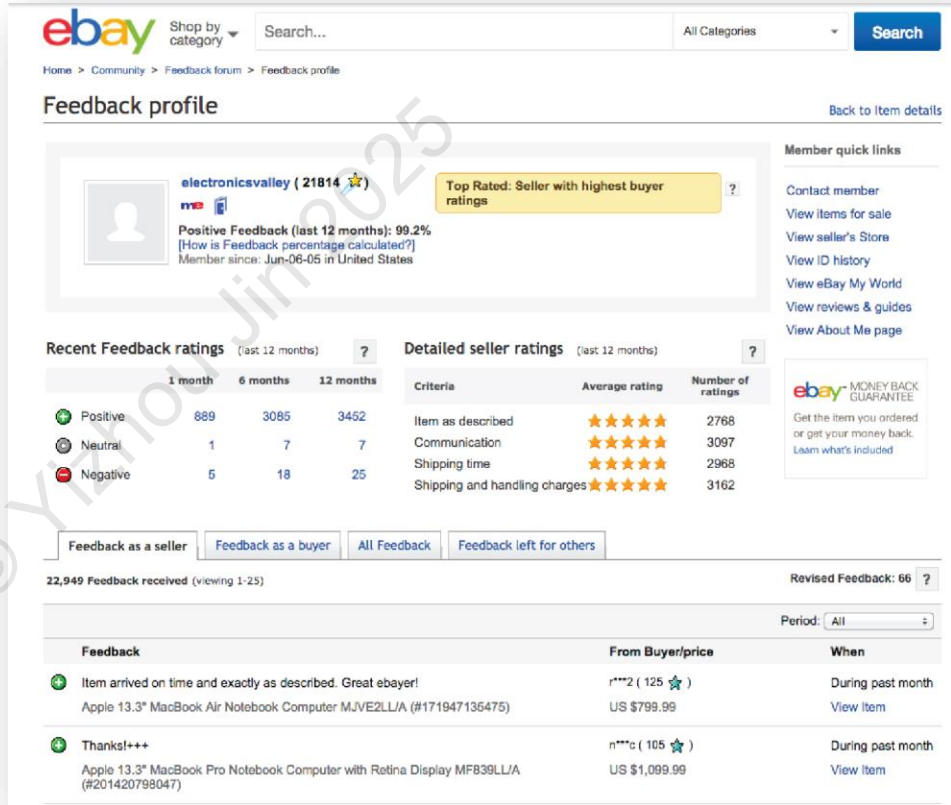
What Info is Asymmetric on Digital Platforms?

- Buyers do not observe seller quality
 - Trustworthiness \rightarrow is quality > 0 ?
 - Match value \rightarrow is this the highest quality product? for whom?
- Almost all service platforms have moral hazard issues
 - [Tadelis Article / for Airbnb] “Even if payment is mediated by the site, there is still a concern that double-sided moral hazard may occur.” (guests not taking care of the property; owners do not sufficiently clean the apartment, etc.)

A Common Solution?



淘宝
Taobao



The screenshot shows an eBay seller's feedback profile for 'electronicsvalley' (21814 stars). The profile includes a search bar, navigation links, and a 'Feedback profile' section. Key statistics include a 99.2% positive feedback rate over the last 12 months and a 'Top Rated' status. The profile also features a table of recent feedback ratings and a detailed seller ratings table.

Feedback profile [Back to item details](#)

electronicsvalley (21814 ★)
 Top Rated: Seller with highest buyer ratings
 Positive Feedback (last 12 months): 99.2%
 [How is Feedback percentage calculated?]
 Member since: Jun-06-05 in United States

Member quick links

- Contact member
- View items for sale
- View seller's Store
- View ID history
- View eBay My World
- View reviews & guides
- View About Me page

Recent Feedback ratings (last 12 months)

	1 month	6 months	12 months
Positive	889	3085	3452
Neutral	1	7	7
Negative	5	18	25

Detailed seller ratings (last 12 months)

Criteria	Average rating	Number of ratings
Item as described	★★★★★	2768
Communication	★★★★★	3097
Shipping time	★★★★★	2968
Shipping and handling charges	★★★★★	3162

Feedback as a seller | **Feedback as a buyer** | **All Feedback** | **Feedback left for others**

22,949 Feedback received (viewing 1-25) Revised Feedback: 66

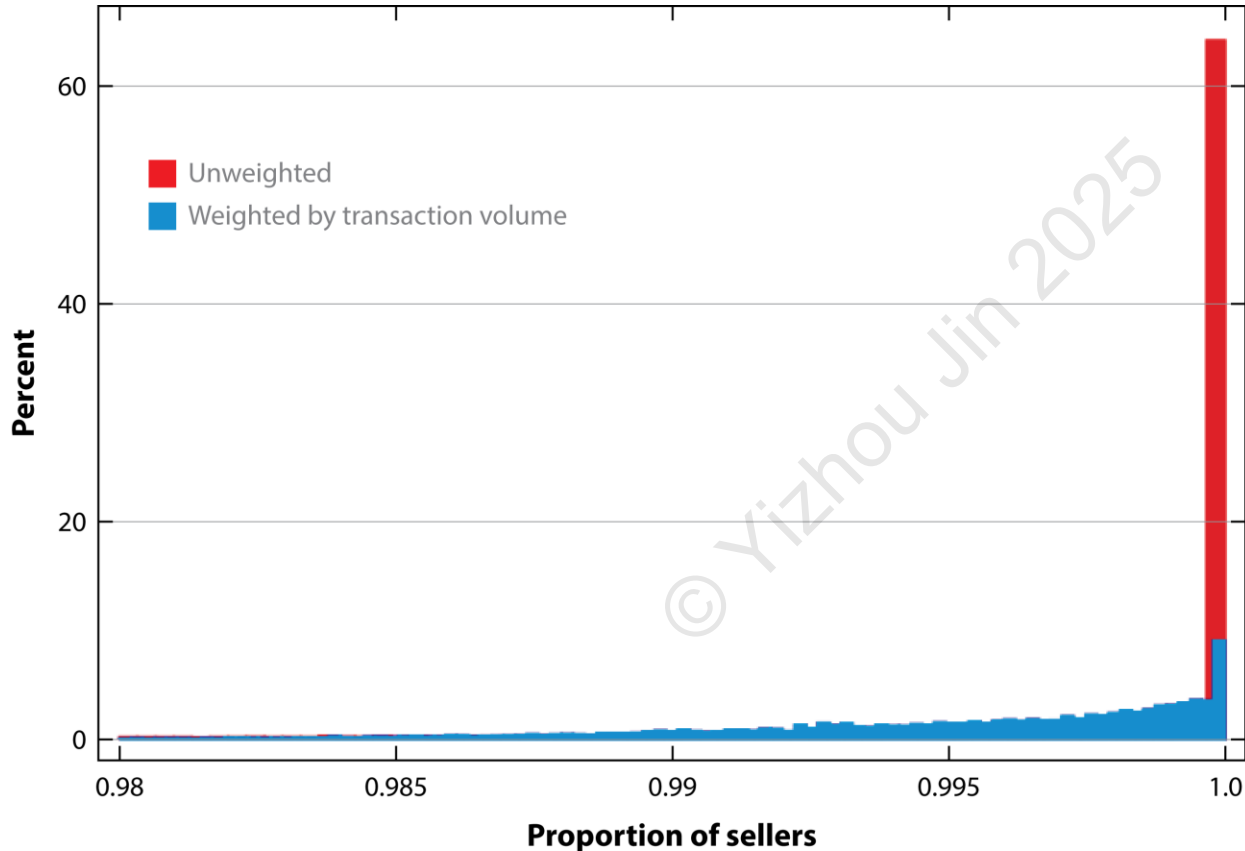
Period: All

Feedback	From Buyer/price	When
Item arrived on time and exactly as described. Great ebayer! Apple 13.3" MacBook Air Notebook Computer MJVE2LL/A (#171947135475)	r***2 (125 ★) US \$799.99	During past month View item
Thanks!+++ Apple 13.3" MacBook Pro Notebook Computer with Retina Display MF839LL/A (#201420798047)	n***c (105 ★) US \$1,099.99	During past month View item

Why are Reviews Effective?

- “provide future buyers with information about the outcomes of a seller's past behavior”
 - Resolves adverse selection by providing quality information
 - Resolves moral hazard by imposing punishment on bad outcome (and thus review)
- Is it perfect though?

Problem 1: Retaliation



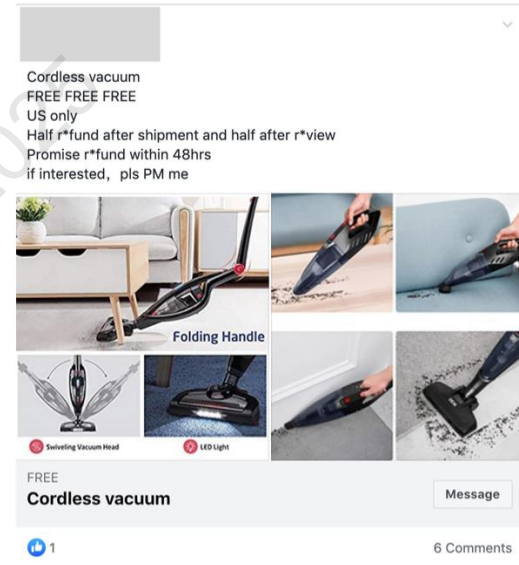
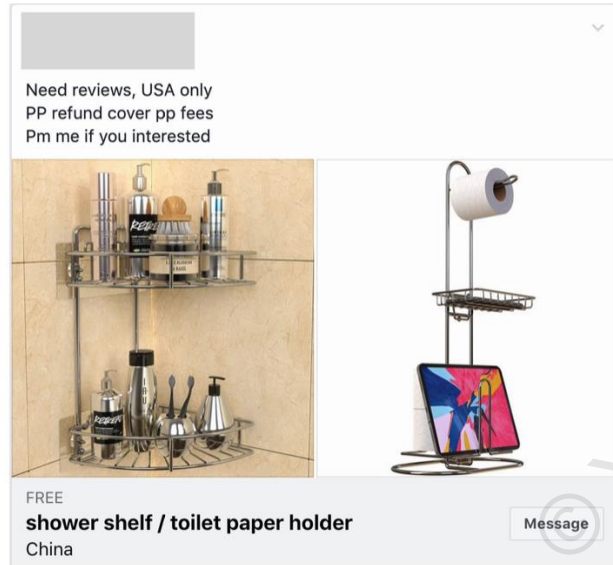
- Almost all reviews are positive!
→ Fear of retaliation
- eBay switched to one-sided review, but it's not feasible for other platforms such as Airbnb.

Does AI/ML Solve this Issue?

- Sort of:
 - Can still extract some information even with “grade inflation”
 - Can start analyzing text data: see discussion re: Masterov et al. (2016) mentioned in the reading materials
- Better solutions:
 - Contracting change: make reviews mandatory / hard to skip (Uber/Lyft)
 - New signals: allow private feedback to the platform (Airbnb)

Problem 2: Fake Reviews

Figure 2: Examples of Fake Review Recruiting Posts

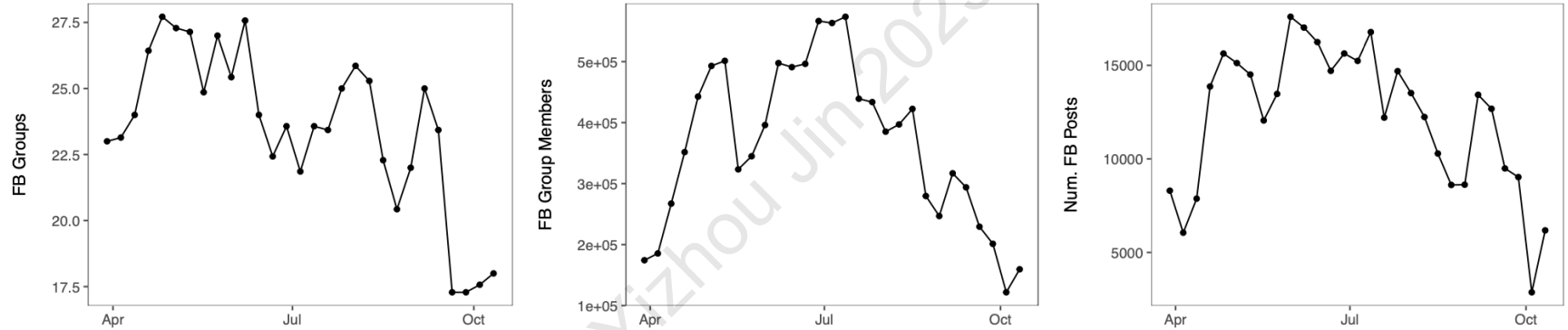


He, Hollenbeck, Proserpio (2020):

Large number of private FB groups that sells fake review services!

Problem 2: Fake Reviews

Figure 1: Weekly average number of FB groups, members, and seller posts



He, Hollenbeck, Proserpio (2020):

Large number of private FB groups that sells fake review services!

Does AI/ML Solve this Issue?

- Not really:
 - Can try to identify fake reviews (suspicious sudden increase / standard phrasing, etc.)
 - But always gameable
- Better solutions:
 - Random audits + high punishment if caught
 - Randomize/reduce the reliance on reviews

Problem 3: Free-Rider Problem

- Actually, WHY do so many consumers leave reviews?
 - “In fact, through the lens of mainstream economic theory, it is surprising that a significant fraction of online consumers leave feedback.” Why?
 - A classic free-rider problem: the value of a good review left by a buyer mostly benefits future buyers!
 - This means that, even if people have intrinsic drive to write reviews, it is probably still socially desirable to have more reviews... especially for new sellers/products!

Problem 3: “Cold-Start”

- New sellers (entrants), unlike established ones (incumbents), do not have past consumer transactions / reviews!
- AI/ML cannot solve this
 - When there's no data, there's no AI/ML!
- Some solutions:
 - Rewarding verified customers for **informative**, not positive reviews (Amazon/Taobao)
 - Signaling!

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Signaling / Screening

Li, Tadelis, and Zhou (2016): “Rebate-for-Feedback” (RFF)

Specifically, in March 2012, Taobao launched a “Rebate-for-Feedback” (RFF) feature through which sellers can set a rebate value for any item they sell (cash-back or store coupon) as a reward for a buyer's feedback. If a seller chooses this option then Taobao guarantees that the rebate will be transferred from the seller's account to a buyer who leaves high-quality feedback. Importantly, feedback quality only depends on how informative it is, rather than whether the feedback is positive or negative. Taobao measures the quality of feedback with a NLP algorithm that examines the comment's content and length and finds out whether key features of the item are mentioned. Hence, the marketplace manages the market for feedback by forcing the seller to deposit at Taobao a certain amount for a chosen period, so that funds are guaranteed for buyers who meet the rebate criterion, which itself is determined by Taobao.⁶

Can you articulate how signaling work here?

Can you articulate the “cost/benefit” structure?



Signaling / Screening

Barach, Golden, Horton (2020): Money-back guarantees.

- Platforms can offer money-back guarantees for certain sellers, and it has a big impact on how much traffic those sellers have (“steering effect”).
 - However, “offering guarantees did not increase sales overall.”
→ guaranteed sellers were not higher quality than the rest
- How can we make this into a screening device so that the platform guarantees only high-quality sellers?
 - Let the sellers pay for guarantees! (there are even insurance companies that insure sellers against guarantee payouts)

I Presented a Related Paper at the FTC

Entry Barrier and Entrepreneur Training on Digital Platforms Evidence from a Large E-Commerce Experiment

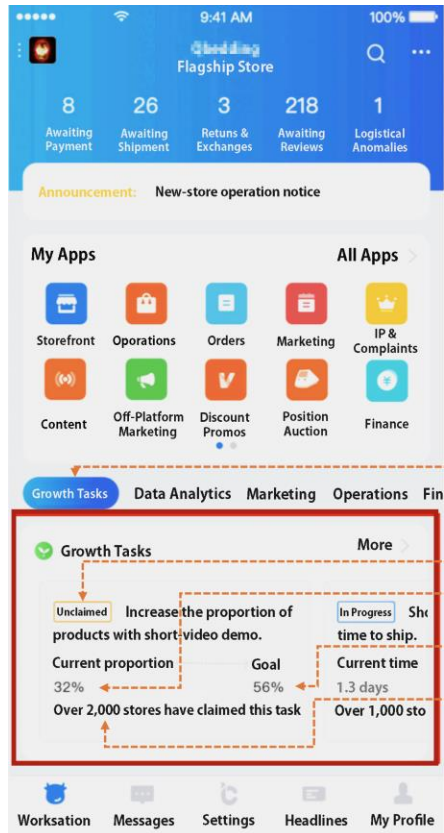
Yizhou Jin
UToronto

Digital platforms have become a main conduit of entrepreneurship

- 1.3 mil new Amazon sellers in 2020, 6.6 mil for Taobao, and 7 mil for Youtube.
- explosion in entry volume exacerbates the “cold-start” problem (Tadelis 2016)

FTC
November 2023

We Developed an AI Training Program



Prominent Front-page Module

Task #1: Unclaimed Current KPI Level

Target KPI Level

of Stores Claiming Task

Progress-tracking Module

Time Left

Current KPI Level

Target KPI Level

KPI Definition

Tutorials



We Developed an AI Training Program

Variable	Treatment (%)	Dep Var Mean	Variable	Treatment (%)	Dep Var Mean
Products			Marketing		
Post Products	0.29 (0.29)	0.34	Ad Bidding	2.86** (1.43)	0.07
Product Variety	0.08 (0.24)	1.25	Has Video Demo	1.93*** (0.67)	0.12
Service			% Ads Traffic	3.33** (1.33)	0.03
Active Time (min)	-0.41 (0.67)	19.17	Pricing		
Reply Time (min)	-0.29* (0.15)	389.02	Avg. Price Per Buyer	0.11 (0.14)	4.39
Service Conversion Rate	1.40*** (0.50)	0.10	Avg. Price Per Product	0.008 (0.026)	3.83

Advertising is the only thing that moved. No change in pricing, product positioning, and small changes in customer service. But there were huge effect on traffic (5.2%) and revenues (6.6%).

We Developed an AI Training Program

Takeaway:

! Advertising is effective because it's a **costly signaling device**.

! It is particularly important among new sellers due to “cold-start”

! But many new sellers don't know about advertising or its value, so training can help a lot

→ ~\$4.7mn extra transactions with negligible cost to the platform!