

Economics of Strategy for Online and Digital Markets

Topics in Economic Theory and Policy, 31C01000

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Lecture 10: Strategies of platforms

What this lecture is not about

“ “ He told his son the secret of the cave, which his son handed down in his turn, so the children and grandchildren of Ali Baba were rich to the end of their lives.

–Ali Baba and the Forty Thieves

” ”

Background story

- In 1998, there were more than 154,000 SMEs in China.
- Trade between the firms was based on personal relationships with partners and cash.
- Doing business outside China was all but impossible.
- In 1999, a company founded by Ma Yun (Jack Ma) opened a website to connect global buyers to Chinese sellers: Alibaba.
- Subsequently it introduced authentication services and various feedback mechanisms.
- By Dec 2001, Alibaba had more than 1 million members.

Background story

- China ca. year 2000:
 - Booming Chinese economy created a lot of retail demand.
 - Conventional retail was hard to scale up quickly enough.
 - Trust was a source of friction, also in the online markets.
- Alibaba launched retail online market place Taobao in 2003, providing the platform without costs.
- It introduced Alipay where payments from the customers would be released to the merchant only after delivery, and partnered with logistics companies.
- Now Taobao, Tmall, Aliexpress, Alipay and other Alibaba brands form the largest online market in the world.

- Pricing
- Openness
- Competition

- Platforms are matchmakers: how matches succeed will depend on the design of the platform.
- Design of the platform needs to take into account how both, or all, sides of the platform will interact.
- Externalities within the groups and between groups make the design problem tricky even for one platform.
- Platform competition makes the design choices even more complex.

- Choice of price on one side affects how many users will use the platform.
- Number of users on that side will affect the interest on other sides through externalities.
- The changes in prices affect market equilibria.

Reminder: Illustrative exchange platform

- The surpluses for the participants are as follows:

$$\pi_b(n_b, n_s; p_b) = (1 - n_b)n_s - p_b$$

$$\pi_s(n_b, n_s; p_s) = (1 - n_s)n_b - p_s.$$

where p_b is the price for buyers and p_s the price for sellers.

Reminder: Platform equilibria

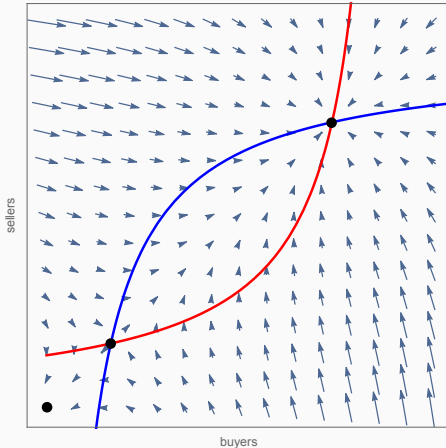


Figure. Indifference curves for buyers (red line) and sellers (blue line) with fixed prices. Black dots show the equilibria, and the arrows to which equilibria a given starting position would lead.

Change in buyers' prices

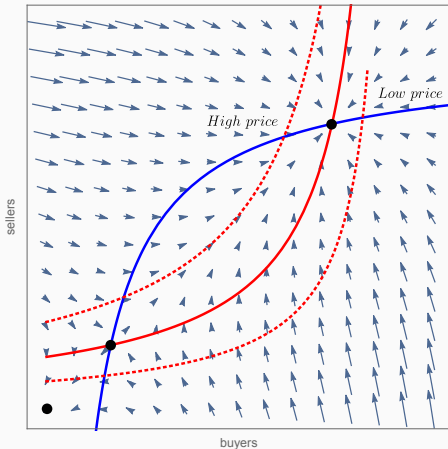


Figure. Indifference curves for buyers (red line) and sellers (blue line) with fixed prices. Dashed lines represent changes in prices for buyers.

Change in sellers' prices

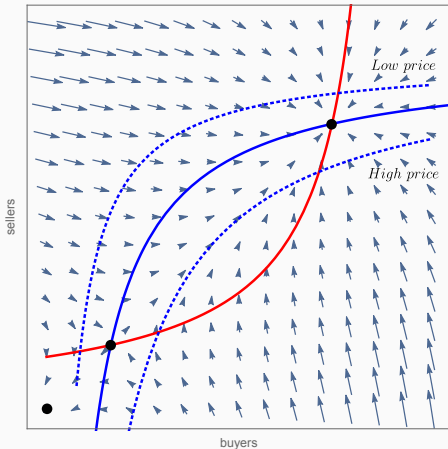


Figure. Indifference curves for buyers (red line) and sellers (blue line) with fixed prices. Dashed lines represent changes in prices for sellers.

Reminder: Simplistic ad market model

- Example of potentially non-trivial changes in equilibria.
- We used the following model:

$$\pi_b(n_b, n_s; p_b) = (1 - n_b)\kappa_b n_b - \lambda_b n_s - p_b$$

$$\pi_s(n_b, n_s; p_s) = (1 - n_s)\kappa_s n_b - p_s.$$

- Main features of the model:
 - Users benefit from other users participating to the network.
 - Advertisers benefit from users.
 - Users dislike advertisement.

Ad market model (illustrative)

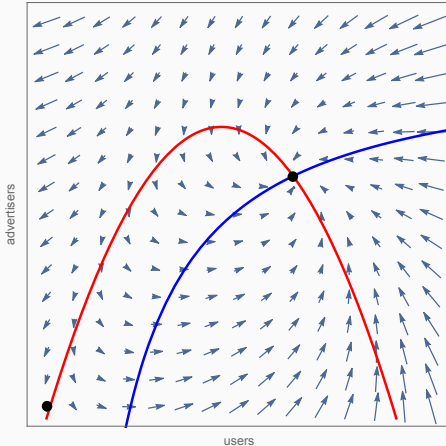


Figure. Simple ad model: Indifference curves for buyers (red line) and sellers (blue line) with fixed prices. Black dots show the equilibria, and the arrows to which equilibria a given starting position would lead.

Ad market model (illustrative)

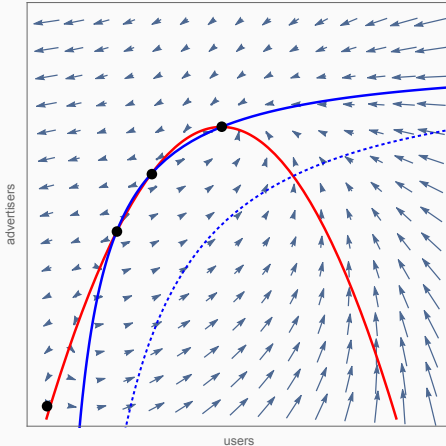


Figure. Simple ad market with lower prices for advertisers (solid blue line): Less users than with higher advertiser prices (dotted blue line). Number of advertisers can become higher, lower, or the same.

More general platform price structure

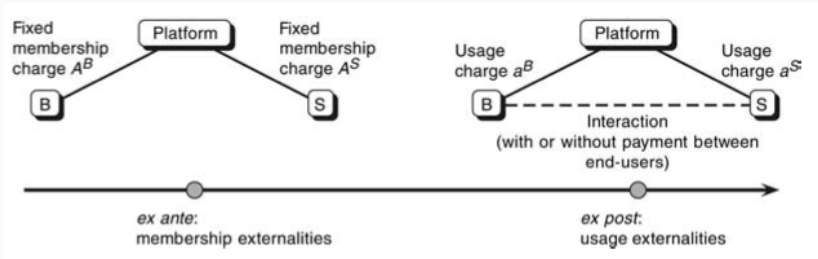


Figure. Simplified pricing structure on a platform.

- Price structure affects profits and economic efficiency.
- Firms use pricing to try to maximize profits and policy makers worry over market power and consumer harm.

Source: Rochet and Tirole, 2006.

- Though similar to complementary of goods, the logic with platform pricing is different:
 - E.g. with tennis balls and a tennis racket the same consumer enjoys the complementary benefit.
 - With platforms, the benefits is divided to different sides.
- Platform pricing affects which side, or the platform operator, enjoys the benefits of complementarities.
- We will go through the intuition for these key questions:
 1. How does socially optimal pricing look like?
 2. How does monopoly pricing differ from the social optimum?
 3. How does competition affect pricing?

Platform pricing – Social optimum

- In general, prices will be different from marginal costs of providing the services to different sides.
- Socially optimal (here Ramsey) pricing aims at getting all sides on board.
- Social planner takes into account the average net surplus created on the other sides of the market when attracting an end user on one side.

Platform pricing – Monopoly

- Usage prices tend to be lower on the market side with a higher price elasticity and which exerts a stronger externality on the other side.
- A profit-maximizing intermediary may subsidize one side of the market because this generates a higher volume of trade and, thereby, higher profits on the other side of the market.
- Pricing below cost may be socially desirable, but the subsidy chosen by a profit-maximizing intermediary may be too low from a social point of view,.

Examples of pricing choices

Industry	Side	Access	Usage
Heterosexual Dating Clubs	Men	✓	✓
	Women	✓	✓
DoCoMo i-Mode	User	✓	✓
	Content-Provider	∅	✓
U.S. Real Estate Brokers	Seller	∅	✓
	Buyer	∅	∅
Magazines	Reader	✓ ($\leq MC$)	∅
	Advertiser	∅	✓
Shopping Malls	Shopper	-	∅
	Store	✓	∅
PC Operating Systems	User	✓	∅
	Developer	✓ ($< MC$)	∅
Video Game Consoles	Player	✓ ($\leq MC$)	∅
	Game Developer	✓ ($< MC$)	✓
Payment Card Systems	Merchant	∅	✓
	Cardholder	✓ ($< MC$)	∅

Figure. Examples of how prices have been set on different platforms.

Source: Evans and Schmalensee 2007.

Examples of pricing choices

Company	Rate	Notes
OpenTable	1.9%	Reservation fee / average meal per person
Homeaway	2.5%	Estimated (low due to use of listing model instead of transaction)
Comparison Shopping	6.0%	Estimated
ebay	9.9%	This is partially listing fees, partially marketing fees, and part PayPal.
oDesk	10.0%	10% on top of all work billed
AirBNB	11.0%	3% + 6-12% depending on size of transaction
Expedia	11.9%	Per 2012 10-K
Amazon Marketplace	12.0%	Guess based on rate table
Fandango	12.5%	Fee charged to user / ticket price
PriceLine	18.5%	Per 2012 10-K
TicketMaster	26.0%	Estimate for tickets sold by TM (non box office) - very hard to discern
Steam	30.0%	Rate card
Itunes	30.0%	Rate card
Facebook Credits	30.0%	Rate card
GroupOn	38.2%	Calculated from 2012 10-K. Does not include direct goods.
Shutterstock	70.0%	From S-1

Figure. Illustrative examples of transactions fees charged by some online marketplaces (estimates from early 2010s).

Source: abovethecrowd.com.

Platform pricing – Example: Credit cards

- Consumers most likely to carry AmEx are those who most value the opportunity to use the card.
- These loyal cardholders therefore value the participation of merchants more than those indifferent between AmEx and another payment form do.
- Given its limited ability to price discriminate, AmEx fails to fully internalize the preferences of loyal users, putting too little effort into attracting merchants and charging them a higher price than would be socially optimal.
- However, when the costs of attracting cardholders rise and therefore cardholder incentives fall, AmEx will tend to serve only users who value merchant participation more strongly, leading them to attract more merchants with lower fees.

Platform pricing – Example: Ad market

- Matters are quite different for the New York Times.
- Its loyal customers are high income readers who dislike advertising but are willing to pay more for the paper's content than marginal readers who are less sensitive to advertising.
- NYT fails to internalize loyal readers' distaste for advertising, leading to potentially excessive advertising as a result of below optimal pricing to advertisers despite market power.
- Increases in the costs of distribution that reduce the number of subscribers will tend to reduce advertisements as the paper internalizes the costs to its wealthier readers.

Platform pricing – Monopoly

- The difference between the above cases is the source of user heterogeneity:
 - Credit card users primarily differ in the interaction (or usage) value they take from merchants accepting cards.
 - Newspaper readers differ most importantly in their membership value from reading the paper's content.
- Participation on one side of the market effectively determines the quality of the platform on the other side.
- Platform internalizes network effects to marginal rather than average participating users, like any monopolist who must choose a single quality as well as quantity (Spence, 1975).

Reminder: monopoly pricing in one-sided market

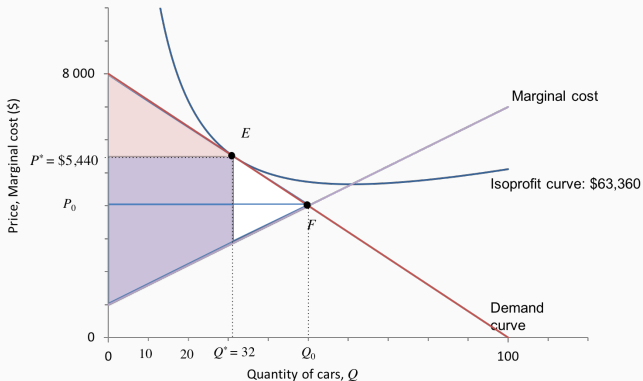


Figure. If a monopoly can charge only one price (at E here), then the allocation is not efficient (example of a classical distortion).

Source: CORE.

Monopoly vs. social planner

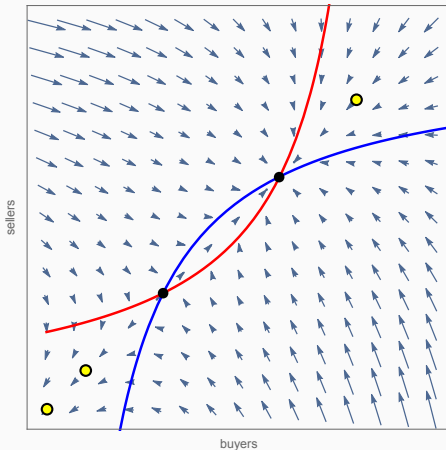


Figure. Simple exchange example with indifference curves (red for buyers, blue for sellers) and equilibria (black dots) drawn with monopoly prices. Yellow dots are equilibria with socially optimal prices.

Platform pricing – Monopoly vs. social planner

The following results hold with some generality:

- A social planner would set prices on side i as

$$p_i^* = \text{marginal cost}_i + \sum_j \text{marginal externalities}_j$$

- And a monopoly would set the price as

$$\tilde{p}_i = p_i^* + \text{classical distortion}_i + \sum_j \text{Spence distortions}_j$$

- Spence distortions from other sides $j \in \mathcal{J}$ result as the platform internalizes only network externalities to marginal users.

Platform pricing – Price discrimination

- Results above assume uniform pricing. With uniform pricing, the additional subscriber to a platform is not rewarded for the benefit that she/he brings to others by subscribing.
- In some cases, externalities can be (partly) internalized through price discrimination:
 - Example: Cantor Fitzgerald pricing towards Salomon Brothers in secondary U.S. bonds market (before 2001).
 - Typical trader paid \$20 per \$1 million face value.
 - Salomon paid \$1 per \$1 million face value plus a fixed fee.
 - Why? Salomon brought immense liquidity to the secondary market because it controlled 40% of the primary market

Platform pricing – Competition

- Tremendous multiplicity of equilibria are possible in competition between platforms depending on the pricing.
- Monopoly and competitive platforms (at least in duopoly) design their price structure so as to get both sides on board.
- Price competition is intensified when consumers place a higher value on the size of the network. This leads firms to reduce prices in order enlarge their network size.
- General results in platform competition are still lacking.

Platform pricing – Multihoming

- An increase in multihoming on the buyer side makes undercutting competitors on the seller side more attractive and results in a price structure more favorable to sellers.
 - For example, if buyers surf more on Aliexpress in addition to Amazon, Amazon may want to seek to reach exclusivity with some sellers.
- The presence of buyers generating a high surplus on the seller side raises the seller price and, in the absence of price discrimination on the buyer side, lowers the buyer price.
 - Example: Alibaba's Tmall.
- Captive buyers tilt the price structure to the benefit of sellers.
 - Example: Amazon Prime.

Platform pricing – Examples

- Sometimes prices are not decided by the platform:
 - Google ad auction sets the prices on the ad market.
 - Other advertisement channels compete for the same revenue.
 - Google affects advertisers by offering large user base, accurate data, and analytics services.
- Online marketplaces typically place charges on the sellers, not buyers
 - However, if buyers and sellers can bargain efficiently (in a Coasian manner), then the side on which the charges are placed does not matter (Rochet and Tirole, 2003).
 - In practice there are inefficiencies and distortions (e.g. Amazon selling directly and charging third parties a transaction cost) that affect competition within the platform.

Platform pricing – Examples

- Free of charge pricing can be useful to attract users initially.
- However, it may not be trivial to introduce charges later and hold on to the user base:
 - E.g. early transition attempts of traditional media to internet.
- Additional services with extra costs are a way to price-discriminate:
 - Same idea as with the free-to-play games (see lecture 5).
 - Alibaba's strategy has been to attract large user base.
 - Capitalization e.g. through payment services (Alipay, PayPal), premium services (Tmall, Amazon Prime) or logistics.
- Or introduce other sides to the platform, e.g. Youtube ads.

- Sometimes a firm can decide if it is a platform or not and how many sides it opens:
 - Apple launched iOS as a one-sided business with in-house apps, the possibility for third parties to sell through AppStore came later.
 - Netflix has decided not to sell ads.
 - Alibaba has decided to sell ads on Taobao instead of charging for transactions.
 - Amazon decides if it sells a product themselves.
- Sometimes the “platformness” is part of the business:
 - Exchanges and transaction systems.

Complementarity and compatibility

- Links on a network are potentially complementary.
- Compatibility makes complementarity actual (nuts and bolts).
- Some network goods are immediately combinable because of their inherent properties (like roads).
- However, for many complex products, actual complementarity can be achieved only through the adherence to specific technical compatibility standards (like Internet).
- Within a platform, the firm chooses whether to provide all services itself or allow others to do some.
 - E.g. choose a logistics partner (UPS, DHL) or build own (Amazon, Alibaba).

Arguments for compatibility:

- Producers' profits can be enhanced when they coordinate on a standard that permits the production of compatible components as there is less competition.
- A network good has higher value than a traditional because of the network effects.
- Different firms conforming to the same technical standard can create a larger network effect while still competing with each other in other dimensions (such as quality and price).
 - Android is a good example. Main code is developed by Google and shared as open source for end application customization.

Arguments for incompatibility:

- Providers of platforms often prefer incompatibility because it locks in current customers and locks out competitors.
 - Apple iOS is an obvious counterexample to Android.
 - Oftentimes in digital world compatible services are hard to envision: e.g. Google search, Facebook or Amazon.
- Network effects that are associated with the installed base generate *switching costs*, which are the costs of switching from one brand to another incompatible brand.
- Also, if users “pay” with e.g. the data that they generate, harder to split profits compared to users paying money for compatible products to different firms (nuts and bolts).

Example: Alibaba platform



“

“Alibaba is what you get if you take all functions associated with retail and coordinate them online into a sprawling, data-driven network of sellers, marketers, service providers, logistics companies, and manufacturers.”
–Ming Zeng, Alibaba Academic Council

”

Figure: Alibaba.

Remember this?



Figure: Wikimedia.

Competition

- In general, the effect of competition is market specific.
- In the video game industry (like Xbox vs. Playstation) competition can improve the availability of games:
 - Competition leads to greater attention to “switching” users who are indifferent between the platforms.
 - Competing firms cater more closely to infra-marginal consumers’ strong taste for greater game availability.
- In newspapers competition may further distort the amount of advertisement:
 - High- and low-quality papers have distinct loyal reader groups.
 - They compete for readers with moderate taste for advertisements. These readers poorly represent the average readership of either paper.

Multiple platforms are more likely to coexist, if

- Platforms are sufficiently different
 - Android and Apple iOS
 - Facebook and Twitter
- Multihoming is feasible
 - Travel search engines
 - Exchanges
- It is hard to differentiate within a platform
 - Advertisers in auctioned ad markets

Winner-take-all competition or not?

Examples of past dominant platforms

- AOL/Time Warner
 - In-house messaging system lost to broadband internet.
- Microsoft Windows
 - Mobile dominated instead by Apple and Android.
- eBay
 - Amazon taken over in the U.S. Alibaba in China etc.
- Apple iTunes
 - Second to Spotify.
- MySpace
 - Lost to Facebook.

Winner-take-all competition or not?

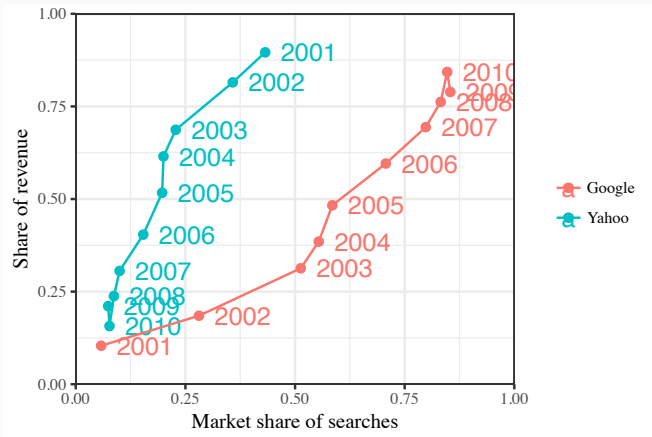


Figure. Development of the share of revenue (for the two) against the share of user searches (total market) for Google vs. Yahoo.

- Reminder of the earlier example, where the surpluses for the participants are as follows:

$$\pi_b(n_b, n_s; p_b) = (1 - n_b)n_s - p_b$$

$$\pi_s(n_b, n_s; p_s) = (1 - n_s)n_b - p_s.$$

where p_b is the price for buyers and p_s the price for sellers.

- Established platform can extract price p from the participants as a payment for the externalities.
- A new platform cannot offer the externalities: it needs to overcome this initial “chicken-and-egg” problem.

- Pricing on platforms is complex. The price on one side affects demand on that side. In pricing there is a need to take into account the externalities that change in demand on one side causes in the other sides.
- Platform competition in the digital domain is even more complex; the outcomes are dependent on the specific market.
- In general, neither monopoly or competition seem to guarantee social optimum in platform markets.

- Rysman, M. 2009. The Economics of Two-Sided Markets. Journal of Economic Perspectives, Volume 23, Number 3.
 - Section on Public Policy will be discussed in lecture 12.

Exercises for Lectures 10–12

Note! To enable short discussion on the model answers on Thursday 14 Feb lecture, the strict deadline for the assignments is on Thursday 14 Feb by noon.

1. Consider the ad market that Google is running.
 - (a) Explain why search is free in Google but advertisers are charged.
 - (b) Why so many advertisers want to have their ads on Google?
2. List 5 reasons why you think Alibaba has been so successful. (You can compare this to the list on Amazon that you did in the very first assignment set). No need for long answers.
3. Why do you think trust is particularly important in peer-to-peer markets?
4. Consider the regulation of data in an online environment.
 - (a) List 3 regulatory concerns.
 - (b) Who should be responsible of the regulation? Motivate shortly.

- Extra from lecture 10: Platform design
- Sharing economy or peer-to-peer markets
- Reputation
- Course feedback