

# product quality over different modes of platforms

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# Outline

## 1 introduction

- platform modes
- network externality
- quality and quantity

## 2 models

- a benchmark model
- complete information
- incomplete information

## 3 alternative explanations

- search theoretic models
- morphism of platforms
- further issues

# introduction

- bazaar v.s. supermarket. note: even inside the supermarket, there are some booths operated directly by the supplier
- taobao v.s. jd, amazon(self-owned and self-support)
- night club v.s. dating website
- operation systems
- game consoles e.g. steam(by valve)
- live stream platforms

# the distinction of two prototypes of platforms

- marketplace/two-sided platforms
- reseller/merchant
- hybrid mode
- “who hold the residual claim?”

# network externality

- one-sided:

$$u_i = \alpha_i + \beta_i f(n) - p_i$$

- two-sided: Armstrong(2006, Rand); Tirole and Rached(2003,2006, Rand)

$$u^i = (b^i - a^i)N^j + B^i - A^i$$

- $u^j = (b^j - a^j)N^i + B^j - A^j$
- multi-sided: Weyl(2010, AER)

# trade-off between quality and quantity

- Hagiu(2011), HBS working paper: average quality
- one-sided platform: club case

$$U(\theta, q) = V(\bar{q}) + \alpha(\bar{q})N - P - \theta c(q)$$

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- two-sided platform: men and women case

$$U_M(\theta_M, q) = \alpha_M N_W - P_M - \theta_M c(q)$$

$$U_W(\theta_W) = V_W(\overline{q_M}) + \alpha_W(\overline{q_M}) N_M - P_W - \theta_W$$

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## settings

- monopolistic platform: consumers can only choose whether go to that platform.
- consumers equal the continuum of  $[0,1]$ , which designates their preference over quality  $i$
- products variety equals  $[0,1]$ , each kind of product has two quality/brand:  $A_h = \chi$ , and  $A_l = 1$ , where  $\chi > 1$
- each brand is monopolized by a specific supplier, with
- unit cost  $c_h$  and  $c_l$ . normalize  $c_l = 0$ ,  $c_h > 0$ , and  $c_h \sim f(c)$
- for each kind of product, consumer  $i$  has unit demand, and the utility function is:
- $u_i = \int_0^1 \max(iA_j - p_j, 0) dj$ , where  $A_j$  and  $p_j$  is the quality and price available at that platform

## reseller/merchant

- monopolistic reseller/merchant
- platform could purchase products with unit price  $a_h$  and  $a_l$
- and sells to consumer with price  $p_h$  and  $p_l$
- the unit selling cost is  $c_0$ ,  $0 < c_0 < 1$
- the fixed cost per brand is  $f$



## marketplace/two-sided platform

- monopolistic marketplace/two-sided platform
- marketplace sets an entry fee per brand, which exceeds its fixed cost  $f$
- once paid the entry fee, supplier could selling products directly to consumers, with unit selling cost  $c_0$

## timing of games

- 1. Reseller makes take-it-or-leave-it offer to suppliers; suppliers decide whether or not to accept
- 1'. Marketplace sets an entry fee, suppliers decide whether or not to join
- 2. Reseller labels prices on existing products
- 2'. Suppliers post prices on their products
- 3. consumer makes purchase decision
- 3'. consumer makes purchase decision

## reseller's profit maximization problem

- reseller knows the exact realization of cost of every high quality product,  $c_{jh}$
- then it could make the offer  $(a_{jh}, a_{jl}) = (c_{jh}, 0)$  to the supplier.  
(note the reseller do not necessarily behave like this, see below)
- four situations:
  - i) only hold high quality
  - ii) only hold low quality
  - iii) hold both high and low quality
  - iv) hold none



## marketplace's profit maximization problem

- marketplace also knows the exact realization of cost of every high quality product,  $c_{jh}$ , so brand-specific entry fee is possible
- backward induction
- supplier's profit maximization problem
- 1) h only
- 2) l only
- 3) h and l
- 4) none

# reseller's tradeoff

- reseller doesn't know the realization of  $c_{jh}$ , only the distribution  $f(c)$  is available
- reseller now can only treat all high quality suppliers ex ante identical
- lemon market

## marketplace's tradeoff

- marketplace doesn't know the realization of  $c_{jh}$ , only the distribution  $f(c)$  is available
- so brand-specific entry fee for high quality supplier is not possible now
- just like the Laffer curve
- leverage entry fee

## what about the worse situation?

- platforms may not even distinguish different quality!
- or the cost of examination is relatively so high
- but some consumers know and value high quality



## search and reputation

- directed search
- Shimer and Shi(2001), JPE
- Chen and Huang(2012), CESifo
- repeated purchase, reputation and dynamic games

# size and functions of platforms

- platform size matters
- chain store and specialized markets
- platforms in platforms
- supplier and platform: industrial monopolist vs local monopolist
- supplier collusion

# optimal mode and welfare

- monopoly and competition of platforms
- platform or merchant or hybrid?
- consumer welfare and social welfare