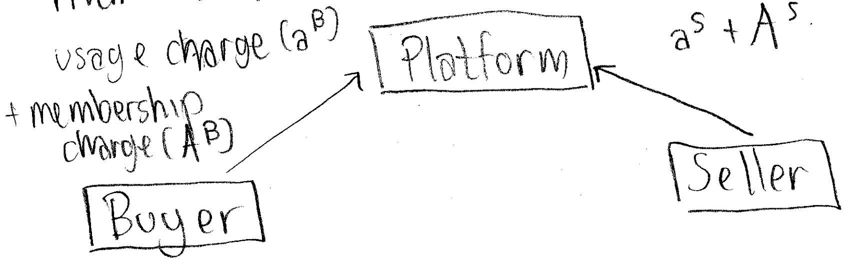
How to allocate the price between the two sides of the two-sided market? Concerns are:

- elasticities and externalities
- competition
- multi-homing (ie buyers can participate in multiple markets)



What you charge to each side depends on elasticities on both sides. Similarly, it depends on surpluses of both sides.

Results in very skewed pricing patterns.

- i.e some newspapers are free. (also, acrobat reader)
  - reader does not pay. Writers pay
- Other examples (books or movies) have viewers paying.
- The "reluctant side" does not pay.
- Credit cards. Schmalensee recently wrote a book on this.

Sometimes you have to attract one side long before the other (eg video game designers) Solutions:

- integration. Then attract external developers
- royalties (I won't charge you now, but I will charge you for each sale - then I have

the incentive to sell more consoles.)

Modelling:

- monopoly platform
- two sides: $i \in \{B, S\}$
- fixed charges A^B, A^S for joining platform.
- usage charges a^B, a^S for transacting.
- There are potentially $N^B \cdot N^S$ transactions

assume no payments between B and S directly.

Then $U^i = (\underbrace{b^i}_{\text{benefit per transaction}} - a^i) N^j + \underbrace{B^i}_{\text{fixed benefit}} - A^i$

- assume that platform's transaction costs are c=0

$N^i = \Pr[u^i \geq 0]$

- b^i and B^i are idiosyncratic.

Per-interaction price (average price): $p^i = a^i + \frac{A^i}{N^j}$

$\Rightarrow N^i = \Pr\left[b^i + \frac{B^i}{N^j} \geq p^i\right] \equiv D^i(p^i, N^j)$

$N^j = \Pr\left[b^j + \frac{B^j}{N^i} \geq p^j\right]$.

$\Rightarrow N^B = n^B(p^B, p^S)$
$N^S = n^S(p^B, p^S)$ demand functions. The solution is a fixed point.

Monopolist's profit:

$\Pi = A^B N^B + A^S \cdot N^S + (a^B + a^S - c) N^B N^S$

$\frac{\Pi}{N^B N^S} = \frac{A^B}{N^S} + \frac{A^S}{N^B} + a^B + a^S - c = p^B + p^S - c$

$$\Pi = (p^B + p^S - c)\, n^B(p^B, p^S)\, n^S(p^B, p^S)$$

(structure) Thus, $V(p) = \max_{p^B, p^S} \{ n^B(p^B, p^S)\, n^S(p^B, p^S) ; p^B + p^S = p \}$

(level) Then $\max_{p} \{ (p - c) V(p) \}$

(ie we decompose this into price level and price structure components

Level: (p): $\frac{p - c}{p} = \frac{1}{\eta}$, $\eta = -\frac{dV}{dp} \frac{p}{V}$

1] Structure:

- assume B^i identical for everyone
- $b^i \sim F^i(b^i)$

We will get $\frac{p^i - (c - p^j)}{p^i} = \frac{1}{\eta^i}$

$$\| $$

$$\frac{p^i - c^i}{p^i}$$

where $c^i = \underbrace{\overset{\text{paycost}}{\widetilde{c}} - p^j}_{\text{get money from other side}}$ • opportunity cost

2] Structure (e.g. software)

- assume B^i is variable, b^i same across users
- assume platform does not monitor usage and $a^S = a^B = c = 0$

Then $\frac{p^i - (-b^j)}{p^i} = \frac{1}{\eta^i}$

What if there are payments between buyers and sellers?
- reinterpretation of B^i and B^j.

assume $b^i \sim F^i(b^i)$ is drawn ex-post (ie after joining the platform).

Coasian bargaining: trade iff $b^B + b^S \geq a^B + a^S = a$
- Pareto-optimal: choose $a^* = c$.
- Since b^i is realized ex-post, no adverse selection problem at this stage.
- Then, extract as much surplus in the fixed fees.

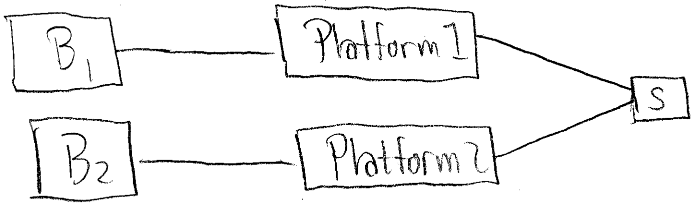
If there are distortions, want to charge $a^* < c$ so that you can extract more in fixed fees.

---

a market is <u>one-sided</u> if V depends only on level $a = a^B + a^S$ and not on its structure. Otherwise, a market is <u>two-sided</u>.

It is not asymmetric information that causes two-sidedness. Rather, it is:
1. Transaction costs
2. constraints on end-user bargaining (ie apple's 99 cent price cap)
3. Fixed membership fees. Would need to bargain <u>before</u> entry decisions are made, but this is unlikely to be possible.

Suppose
- buyers single-home
- sellers multi-home



Who pays in this situation? Buyers face Bertrand prices and sellers face monopoly prices.

- Once the platforms get the buyers they will be able to extract more from the seller

Wednesday: Chapter 8 of Tirole.