Market power, competition, and welfare

1. Allocative efficiency
2. Productive efficiency
3. Dynamic efficiency
4. Public policies, and incentives to innovate
5. Will the market fix it all?

1. Allocative efficiency

Definition of market power: the ability of a firm to profitably raise price above marginal costs

A matter of degree, not of existence

The deadweight loss (see Figure 2.1)

Inverse relationship between market power and welfare

An additional loss of monopoly: *rent-seeking activities* (see Figure 2.2)

Figure 2.1. Welfare loss from monopoly

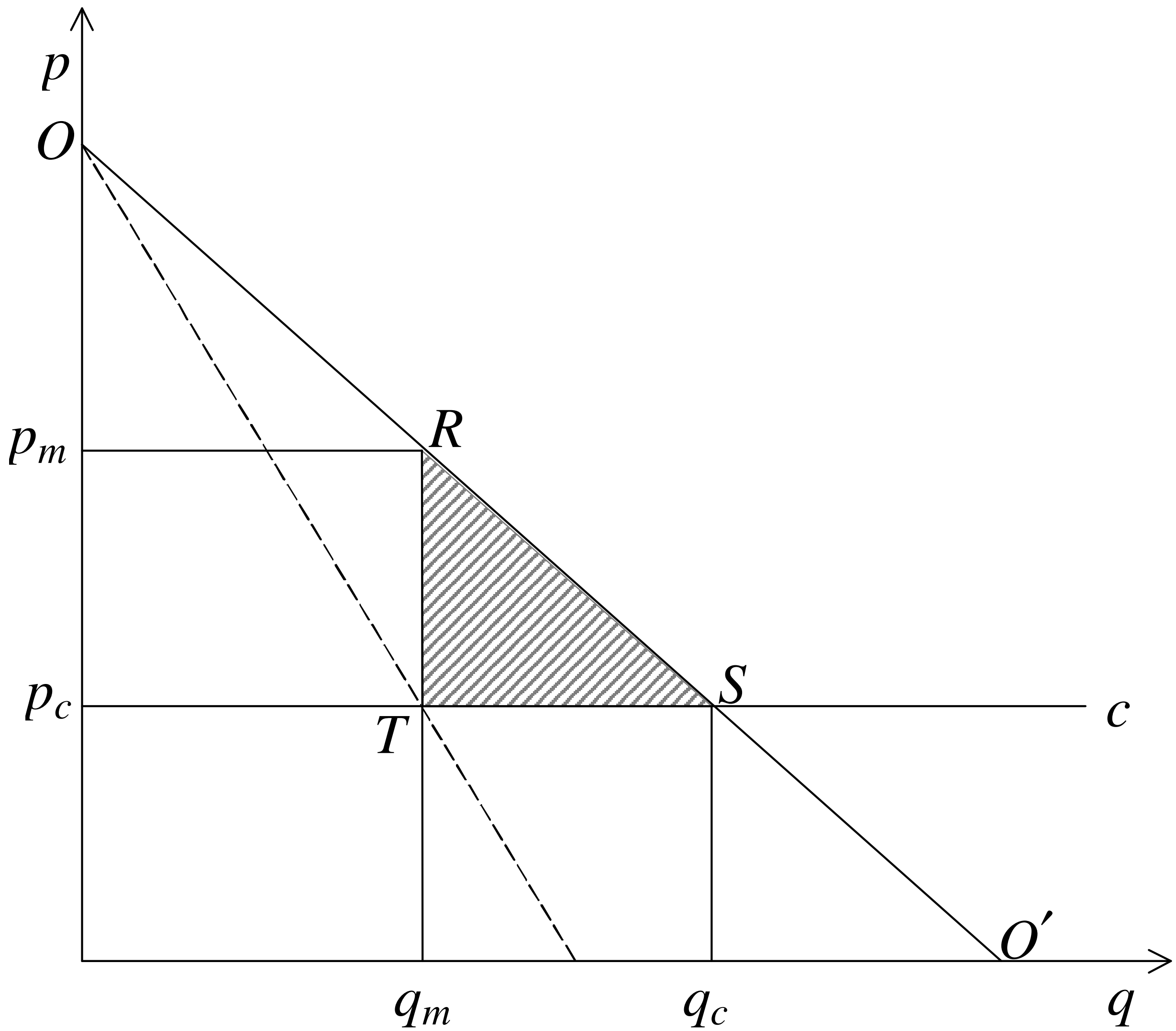
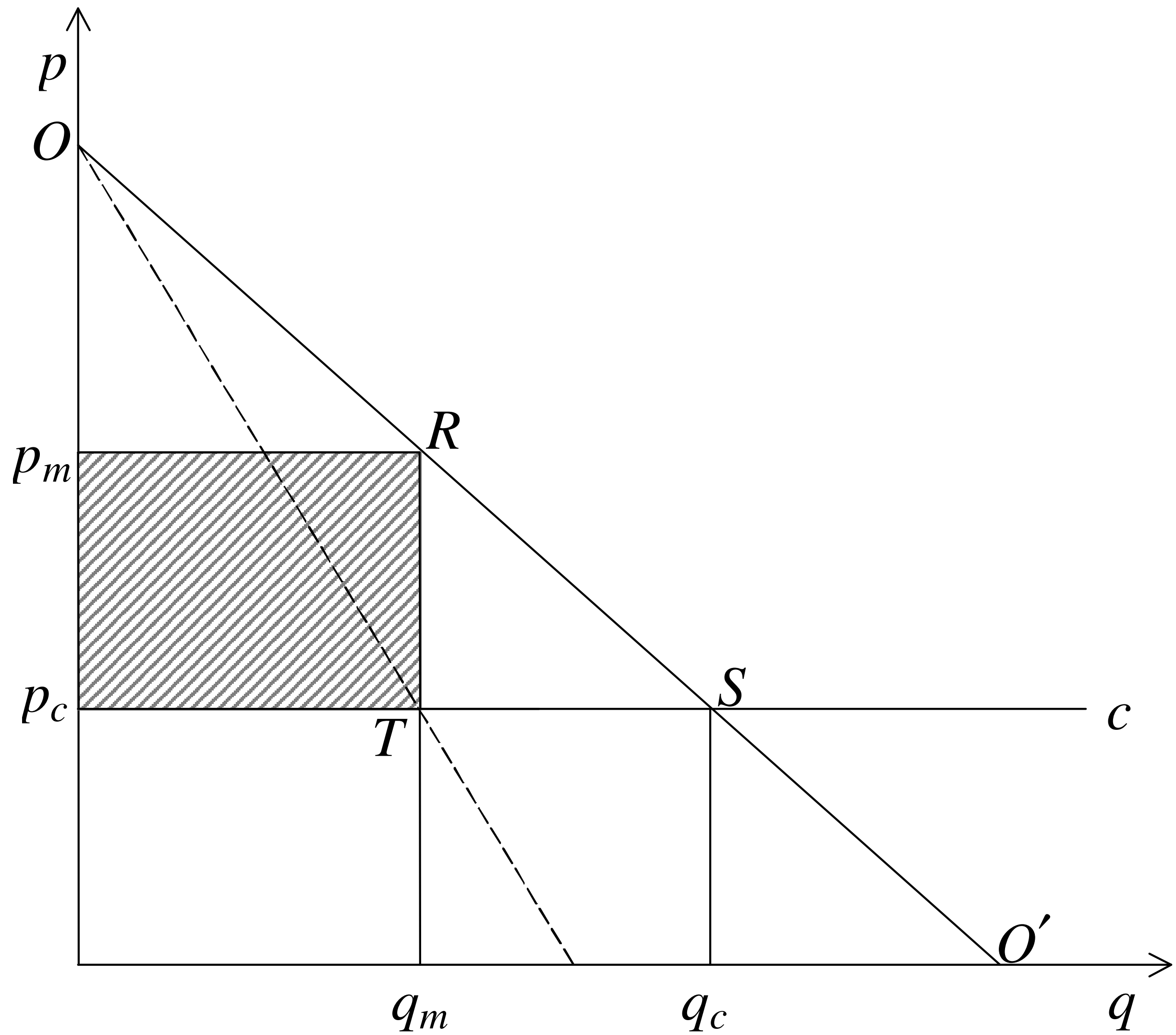


Figure 2.2. Possible additional loss from rent seeking



2. Productive efficiency

Additional welfare loss if monopolist has higher costs (see Figure 2.3)

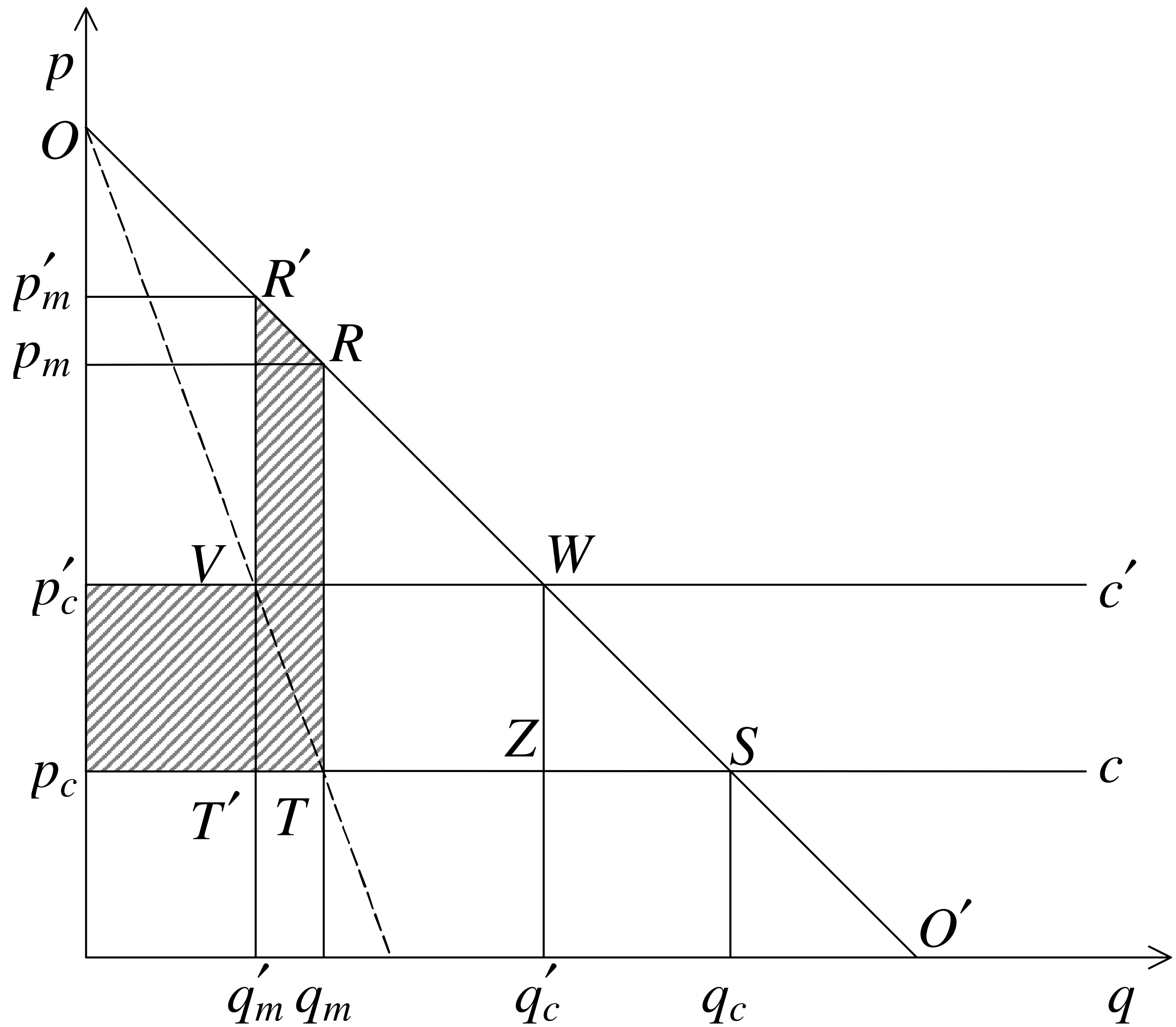
"Quiet life" and managerial slack

- Principal-agent models: market competition helps, but too fierce competition may decrease efficiency
- Nickell et al.: individual firms' productivity higher in competitive industries

Darwinian arguments: competition selects more efficient firms

- Olley-Pakes, Disney et al.: industry productivity mostly increases through entry/exit

Figure 2.3. Additional loss from productive inefficiency



Productive efficiency, II

Number of firms and welfare: trade-off between allocative and productive efficiency

As number of firms increases, market power decreases, but also welfare

Important: defending competition, not competitors! (else, inefficiencies, and fixed cost duplications)

3. Dynamic efficiency

U-shaped relationship between market power and welfare: trade-off between appropriability and competition in R&D investment

Lower incentives to innovate of a monopolist: innovation introduced if *additional* profits higher than costs

Appropriability matters: no (little) innovations if no patent protection, compulsory licensing etc...

4. Public policies and incentives to innovate

Ex ante (incentives) v. ex post (diffusion): IPR protection guarantees market power

Essential facilities (EF) doctrine

- Necessary, non-reproducible inputs
- Ex.: airport slots, port installations, local loop…
- EC accept EF doctrine, but ECJ: *Bronner* case
- Important to preserve incentives to innovate!
- Apply EF doctrine only when owner has not invested to create the facility

5. Will the market fix it all?

Contestable market theory: does free entry eliminate all concerns about market power of incumbents?

Persistence of dominance under free entry

Endogenous sunk costs industries: finiteness property

Network externalities (definition, direct and indirect, coordination effects, interoperability)

Switching costs (definition, natural v. artificial, competitiveness of switching cost markets)

Predatory and exclusionary practices

Contestable markets

Assume an incumbent I and a potential entrant E are equally efficient and produce homogenous goods.

Cost of production is $F+cq$

Baumol et al (1982): at equilibrium I will not set monopoly price, but p equal AC: $p=c+F/q$

Proof (a contrario):

- If $p>AC$, firm I would make profits; E would be attracted into the industry, set $p=AC-\varepsilon$ and earn positive profits
- If $p<AC$, firm I would make losses.

Contestable markets: discussion

The theory of contestable markets would have strong implications: if entry is free, we should not care about monopolists, as efficient outcome is reached.

Critique: the theory hinges on two strong assumptions:

- Unrealistic timing of the game (I cannot change price as E enters the market)
- No fixed sunk costs of entry (hit-and-run strategy not profitable for E if some costs are non-recoverable)

But the theory has the merit to stress the role of free entry in limiting market power: crucial in merger analysis.

Finiteness Property

Consider the following model (a very simplified version of Shaked-Sutton's (1982)

There exist n firms each with a product of quality u_k (labelled so that $u_1>u_2>\ldots>u_n$) and a price p_k

There exists a continuum of consumers with identical tastes but different incomes t. t is uniformly distributed with density S (S=size of the market) on a support [a,b], with a>0.

Consumers buy one unit of the good (the market is covered), and have utility $U(t,k)=u_k\,(t-p_k)$

The game

1. Firms decide on entry (fixed cost $\varepsilon>0$)
2. They decide on quality of the good
3. They decide prices and sell (zero marginal costs)

Proposition: *If $b<2a$, only one firm will enter the industry at equilibrium (whatever S)*

(As income becomes less concentrated, more firms can enter; e.g., if $2a<b<4a$, two firms will enter at equilibrium. Generally, the number of firms which co-exist at equilibrium is finite even as S goes to infinity)

Proof of the proposition

We show that two firms cannot co-exist at equilibrium.

Firms' demand is derived by finding the consumer indifferent between the two qualities:

From: u_1 $(t-p_1) \geq u_2$ $(t-p_2)$, we obtain:

$$t \geq t_{12}(p_1, p_2, u_1, u_2) = \frac{u_1 p_1 - u_2 p_2}{u_1 - u_2}$$

All consumers with income $t \geq t_{12}$ will buy 1, all others will buy 2. Therefore:

$$q_1 = b - t_{12};\ q_2 = t_{12} - a.$$

Proof (cont'd)

Profits can be written as:

$$\Pi_1 = \left(b - \frac{u_1 p_1 - u_2 p_2}{u_1 - u_2} \right) p_1; \quad \Pi_2 = \left(\frac{u_1 p_1 - u_2 p_2}{u_1 - u_2} - a \right) p_2$$

By setting $d\Pi_i/dp_i=0$ we obtain the best reply functions:

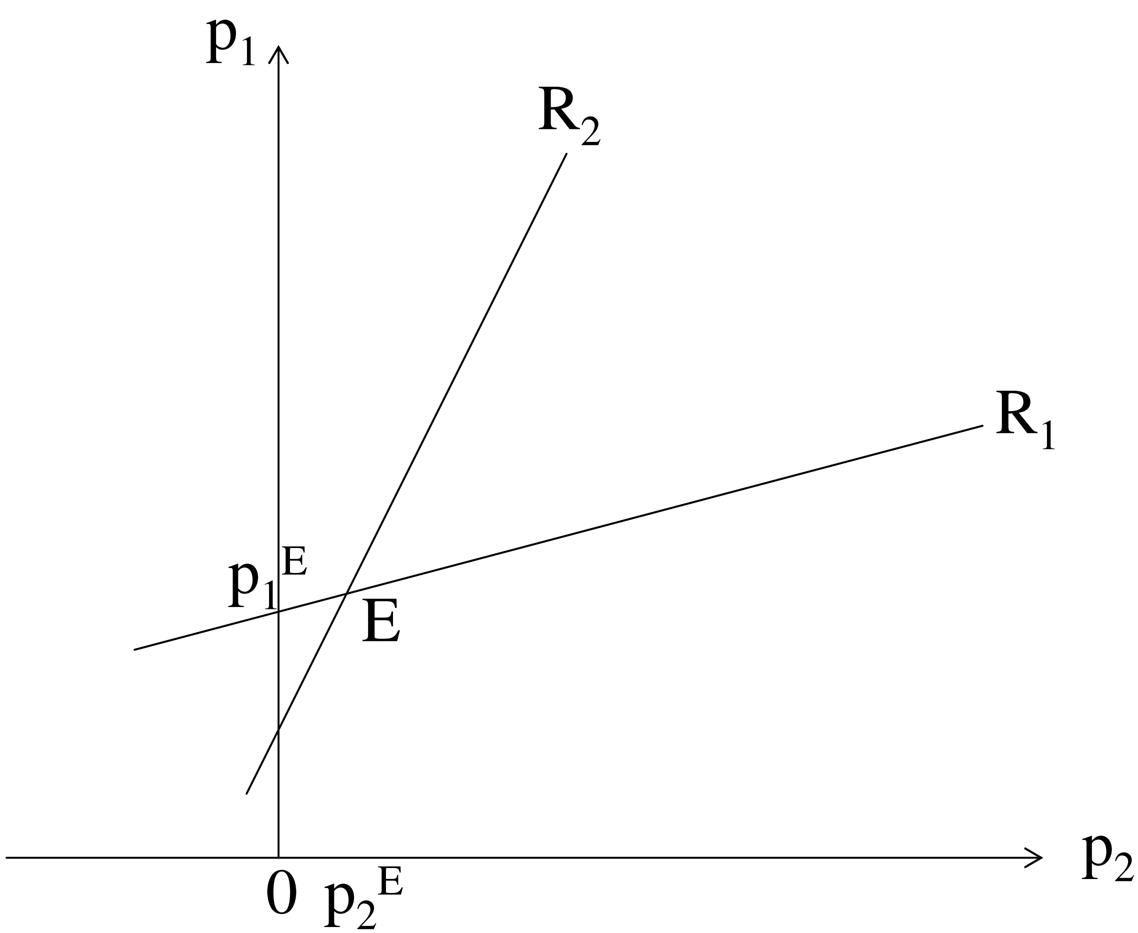
$$R_1 : p_1 = \frac{b(u_1 - u_2) + u_2 p_2}{2u_1}; \quad R_2 : p_1 = \frac{a(u_1 - u_2) + 2u_2 p_2}{u_1};$$

Equilibrium prices are given by:

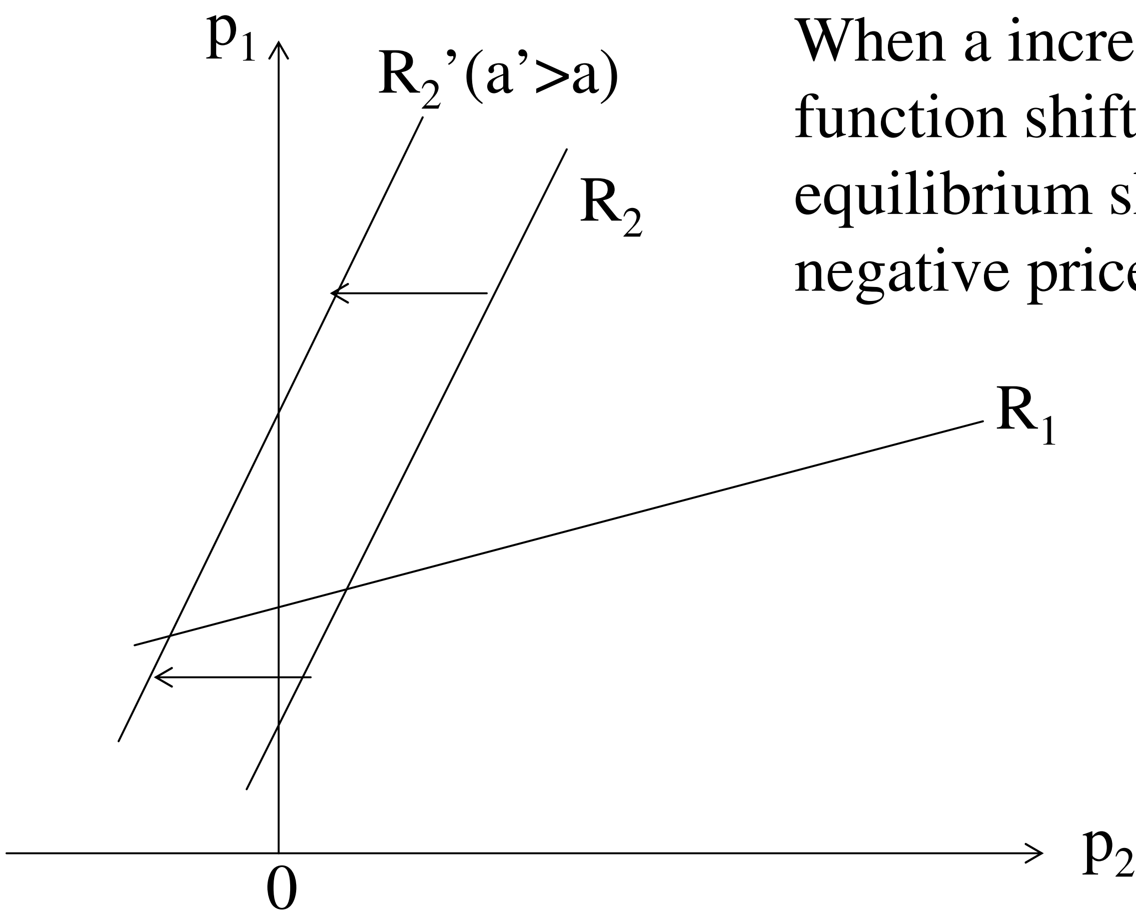
$$p_1^* = \frac{(2b - a)(u_1 - u_2)}{3u_1}; \quad p_2^* = \frac{(b - 2a)(u_1 - u_2)}{3u_2}$$

Therefore, if b<2a there exists no equilibrium with positive p_2, and firm 2 will not enter the industry.

Equilibrium, when b>2a



No equilibrium, when b<2a



When a increases, 2's best reply function shifts upwards and the equilibrium should involve a negative price of firm 2.

Generalisation

The finiteness property holds if the cost of producing a higher quality does not fall upon variable costs

It holds across a number of different specifications (see e.g., Shaked-Sutton, 1987)

Sutton (1991) puts the result to an empirical test. It shows that in advertising-intensive industries as S increases the industry does not become fragmented (when S increases, firms have incentive to increase Ad, which in turn raises fixed costs and limit the number of firms in the market).

Network effects: miscoordination

Assume that consumers value a network good i as:

$$U_i = v_i\,(n) - p_i,$$

Where v_i (n) is valuation if n consumers buy good i.

v_i (n) is non-decreasing and concave, with v_i (1)=0 and v_i (z) = v_i (z+j) for any j>0 (all externalities exhausted at size z)

There are an incumbent I and an entrant E, with $c_E<c_E$. Networks of equal quality. Small fixed cost of entry, $\varepsilon>0$.

There are z 'old' consumers, and z 'new' consumers.

The game

1. E decides whether to enter or not
2. Active firms set (uniform) prices, p_I and p_E
3. The z 'new' buyers decide btw. network I and E

Assume the two networks are incompatible.

This game admits two types of equilibria:

- Entry equilibria, where the efficient entrant enters
- Miscoordination equilibria, where the inefficient incumbent remains a monopolist

Entry equilibria

There is an entry equilibrium where E enters, $(p_I,p_E)=(c_I,c_I-\varepsilon)$, all z new consumers join E's network.

<u>Proof</u>.

A consumer would have no incentive to deviate. At (candidate) equilibrium, its surplus is $v(z)-c_I$. By deviating and buying from I, it also gets $v(z)-c_I$.

Firm I has no incentive to deviate (zero profits also if it raises price, negative profits if reduces it).

Firm E neither: zero profits if it raises price, lower profits if it reduces it.

Miscoordination equilibrium

There is a miscoordination equilibrium where E does not enter, I sets monopoly price $p_I = v(z)$, and all z new consumers join I's network.

Proof.

Suppose the entrant has entered and set a price as low as c_E. A consumer would have no incentive to deviate. At (candidate) equilibrium, its surplus is 0. By deviating and buying from E, it gets $v(1)-c_E<0$.

Firm I has no incentive to deviate (zero profits if it raises price, lower profits if reduces it).

Firm E neither: negative profits if it enters.

Exclusion in network markets

Incumbents can use their customer basis to exclude more efficient entrants. For instance:

- By using price discrimination the incumbent can exclude easily
- Making a product/network not compatible with other product/networks consumers may not buy the latter
- Since coordination of consumers play important role, incumbent may manipulate expectations so as to deter entry