Competition Policy & Game Theory

Chapitre III
Market Power and Welfare

Roadmap

0. Introduction
1. Allocative efficiency
2. Productive efficiency
3. Dynamic efficiency
4. PUblic policies and incentive to innovate

Introduction

Different Inefficiencies

As you already know, monopoly and oligopoly pricing results in a welfare loss, and there is an inverse relationship between market power and welfare.

That is, given technologies.

We develop the idea that a monopoly might result in productive and dynamic inefficiencies too. It might have too high costs and innovate too little, since, it is not pushed to adopt the most efficient technologies and to invest much in R & D.

Short Definitions of competition policy

What could do the government in order to increease social welfare ? Any idea should be carreful that the government do not distort the allocation of resources and reduce the economies of scale. Then, Competition policy could be defined like that :

- Competition policy is not about maximizing the number of firms
- Competition policy is about defending market competition in order to increase welfare, not about defending competitors

Short Definitions of competition policy

1. Allocative efficiency

Market power

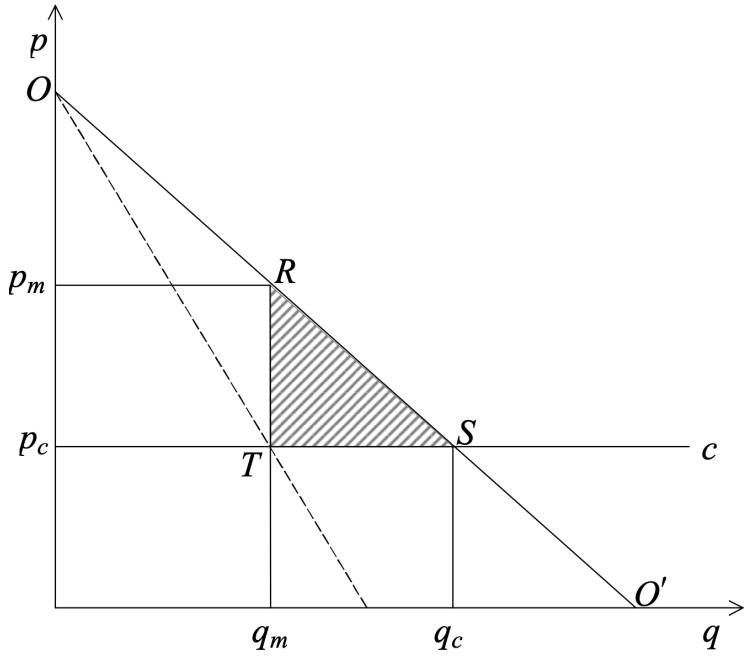
Definition

Market power refers to the ability of a firm to riase price above somee competitive level - the benchmark price - in a profitable way. It is usually defied as the difference bteween the price charged by a firm and its marginal cost of production

The concept of "market dominance" used in European competition law does not have a clear translation in economic terms ; it can be interpreted as a situation where a firm has a large degree of market power, which allows it to charge prices which are close enough to those that a monopolist would charge.

The allocative inefficiency of a monopoly

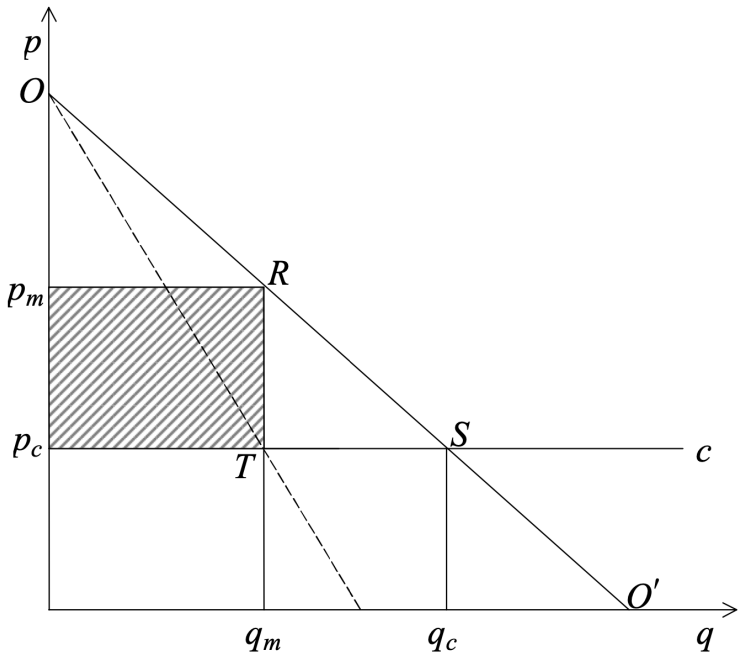
- draw the deadweight loss ; Write also the monopoly pricing equation



- Industries' producers will try to lobby in favour of more protection and less competitive pressure.

Rent-seeking activities

- Possible additional loss from rent seeking activities, when firms use ressources to increase their lobbying power, reesources that would could be put in more productive use. A firm operating under monopoly has higher cost



- Posner (1975) argues that this extra-cost should include an area which might be as large as the overall monopoly profit : agents compete in order to appropriatee thee monopoly rent, by bribing officials, by forming lobbying groups...

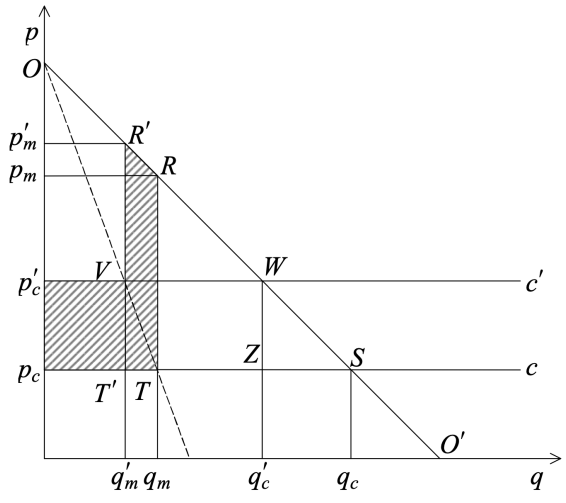
This is the case if :

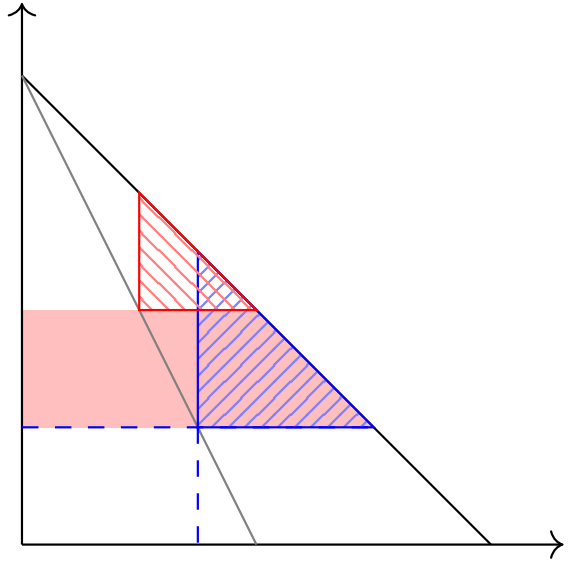
1. There exists perfect competition among agents who engage in rent seeking activities
2. The rent-seeeking technology is characterized by constant return to scale
3. The costs incurred to obtain the monopoly rent do not have any socially valuable by-product

3. Productive efficiency

Additional loss from productive inefficiency

- Suppose that a monopoly does not adopt the more efficient technology that would use firm operating under competition, which translates by $c' > c$





- This extra cost should be expected when a firm does not face any competitive pressure. The idea that competitive pressure leads a firm to look for the most efficient way to organise its production dates from Adam Smith, discussed by John Hicks, Leibenstein introduced the concept of X-inefficiency.

This is the case if :

1. Managers of a monopolistic firm have less incentive to make effort (difference between shareholders and managers, Principal agent models and managerial slack hypothesis)
2. When competition exists, more efficient firms will survive and thrive, whereas less efficient firms will shut down. If the monopoly exists, the market will not operate any seleection and an inefficient firm is as likely to survive as an efficient one.

A model of competition and selection of firms

Homogeneous good ; firms compete in quantities. Theree are nk firms with a high marginal cost c_h and $n(1-k)$ firms which cost is c_l. The demand is $p = 1 - q$.

The profit function of low (i) and high (j) cost firms are

$$\pi_i = (p(q) - c_l)q_i$$
$$\pi_j = (p(q) - c_h)q_j$$

the FOC

$$-q_i + 1 - \sum_{i \in L} q_i - \sum_{j \in H} q_j - c_l = 0$$
$$-q_j + 1 - \sum_{i \in L} q_i - \sum_{j \in H} q_j - c_h = 0$$

The symmetric equilibrium allow to simplify the FOC :

$$q_l = \frac{1 - c_l - knq_h}{1 + (1-k)n} \qquad q_h = \frac{1 - c_h - (1-k)nq_l}{1 + kn}$$

the solution being

$$q_l^* = \frac{1 - c_l + nk(c_h - c_l)}{1 + n} \qquad q_h^* = \frac{1 - c_h + n(1-k)(c_h - c_l)}{1 + n}$$

at the price

$$p^* = \frac{1 + nkc_h + n(1-k)c_l}{1 + n}.$$

Notice that the high cost firm produce iff $c_h < \frac{1 + n(1-k)c_l}{1 + n(1-k)}$, a condition more stringent when n larger.

Competition with LESS firms, and still p^* decreasing.

3. Dynamic efficiency :

Lower incentive to innovate

Let suppose that a monopolist has the possibility to adopt a process innocation which allows it to produce at the lower marginal cost c_l rather thn at thee current cost c_h, by paying a fixed cost F. The new technology is adopted when $\pi_l - \pi_h > F$.

Compare this trade off, the same decision for a firm which operates in a competitive environment. With thee current technology, under price competition, all firms charge $p = c_h$; when one of the firms has the chance to adopt the new technology, which allows it to operte at cost c_l, it will stay alone in the market with the possibility to make a profit π_l. Hence, this firms will innovate if $\Pi_l > F$, a less demanding condition.

- Old debate on the link between monopoly power and innovations. Schumpeter suggested that monopoly power encourages research and development efforts.

Incentives to invest in R& D

Competition stimulates innovations, but so does the expectation of being able to appropriate its investment in R & D through market profits.

Consider the preceding model in which when there is competition all firms are able to adopt the new technology. This is the case when there is no patent proteecting the innovating firms. In that case no innovation will arise under competition.

- Eliminating market power cannot bee an objective that any public policy should pursue.

Monopoly gives fewer incentives than duopoly to innovate

Consider first a monopoly operating at cost c_h, with a linear demand $p = 1 - q$. It can adopt $c_l = c_h - \varepsilon$ if it pays F. The condition to innovate is

$$\Delta\Pi = \frac{\varepsilon}{4}(\varepsilon + 2(1 - c_h)) \geq F,$$

Consider the duopoly case. Two firms face the same market $p = 1 - q$, and there is price competition. In the first stage of the game they decide whether they want to pay F or not.

When they take the same decision, they finish with zero profit. If only one innovate, either it sets the monopoly price *[drastic innovation]* or a price slightly below the cost of the non innovating firm *[non-drastic innovation]*.

In the case of a non-drastic innovation, the firm 's profit in the Bertrand game is $\Pi_{nd} = \varepsilon(1 - c_h)$ that verifies $\Pi_{nd} \geq \Delta\Pi$!

R & D and competition

Let consider a model in which firms invest in R & D and then compete in quantities. We show that the degree of market competition has an effect on dynamic efficiency.

$p = a - q$. Firm i cost is $c_i = C - x_i$ where x_i is the R & D investment made by firm i. The cost of R & D is $gx_i^2/2$.

The Cournot output is

$$q_i^c = \frac{a - c_i + \sum_{j \neq I}(c_j - c_i)}{1 + n} \qquad \pi_i^c = \left(\frac{a - (C - x_i) + \sum_{j \neq I}(x_i - x_j)}{1 + n} \right)^2 - gx_i^2/2$$

and for a symmetric equilibrium, we have

$$\frac{\partial \pi_i}{\partial x_i} = \frac{2n(a - C + x_i)}{(1 + n)^2} + \frac{2n(n - 1)(x_i - x)}{(1 + n)^2} - gx_i = 0,$$

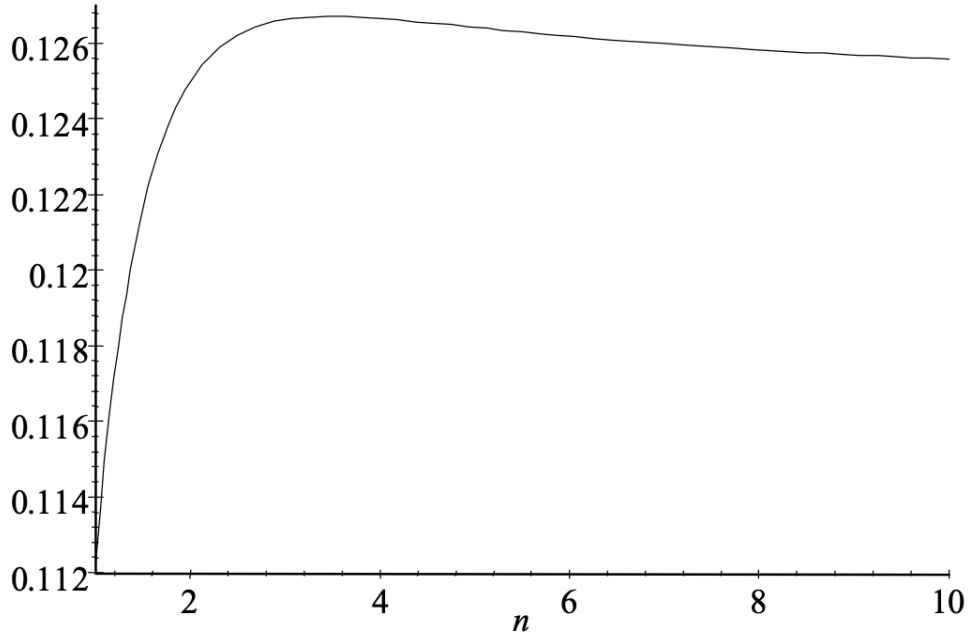
the appropriability effeect (the larger the deman, the stronger the incentive to do R& D, the competition effect (that desappears completely when $n = 1$, and the marginal cost of R&D.

We obtain

$$x^c = \frac{2n(a-C)}{g(1+n^2)-2n} \qquad R^c = \frac{2n(a-C)(g(1+n)-n)}{[g(1+n^2)-2n]^2}$$

One checks that $\frac{dR}{dn} > 0$: the more firm, the more R&D Carried out

However, Welfare is not increasing with n. For instance, we simulate Welfare Wc as a function of the number of firms n (a $= 1$; c $= .5$; g $= 4$) in the following figure.



4. Public policies and incentives to innovate

Scope for public policies

There is a large scope for public policies, that can develop incentives to innovate, propose essential facilities.

In the law system, property rights

Regulation and price controls. Market forces alone will not fix it all. Often incumbent firms are able to keep and reinforce their market power. Competition policy must be vigilant and guarantee an environment where potential and actual competitors are able to challenge firms enjoying a position of large market power