Monopoly: static and dynamic efficiency

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Perfect competition, monopoly and welfare

• Allocative Efficiency: \( P = MC \)
  - Monopolies fail as \( P > MC \)
  - Competitive Firms always are Allocatively Efficient

• Productive Efficiency: \( P = \text{min. of AC} \)
  - Monopolies fail as \( P > \text{min of ATC} \)
  - Competitive Firms achieve it in the long run

• Dynamic Efficiency

• Pareto Optimality
Consumers are willing to pay more than they have to because of the operation of the market.

The difference between what the producer receives and the marginal cost of supplying that unit.
Demand with perfectly elastic supply

Consumer Surplus

\[ P_{pc} \]

\[ Q_{pc} \]

\[ MC = AC \]
Consumer Surplus under perfect competition

Resource cost under perfect competition.
Monopoly: market power and allocative efficiency

- **Market power** refers to the ability of firms to charge prices above marginal costs.
- Monopoly’s problem: \( \max \pi(q) = qP(q) - C(q) \)
- FOC gives: \( P(q) - C'(q) = -qP'(q) \)
- Inverse elasticity price of demand: \( 1/\eta = -qP'(q)/P(q) \)
- Divide both sides of by \( P(q) \) yields:

\[
\frac{P(q) - C'(q)}{P(q)} = \frac{1}{\eta}
\]

*Mark-up (Lerner Index) = Inverse elasticity*

- A profit-maximizing monopolist **increases its markup as demand becomes less price elastic.**
Note how the slope of the Marginal Revenue curve falls at twice the rate of the Demand curve.

Note too that MR cuts the horizontal axis equidistant between the origin and where the demand curve cuts the horizontal axis, (i.e. 0,MR = MR,D)

Graph showing:
- P on the vertical axis
- Q on the horizontal axis
- Pm and Ppc
- Qm and Qpc
- MR and MC = AC
Consumer Surplus under monopoly
profit under monopoly.
Monopoly: allocative inefficiency

Deadweight Loss in Monopoly (Harberger’s Triangle)
Monopoly: Allocative Efficiency

Value to buyers is greater than cost to seller.

Value to buyers is less than cost to seller.

Efficient Quantity \( MC = MB \)

Welfare is Maximized!

Marginal cost

Demand (marginal benefit: value to buyers)

\( MC = MB \)
Determinants of the deadweight-loss

- The higher the price $p$, the larger the welfare loss caused by market power.
- As market demand elasticity decreases, monopolist charges higher prices and the deadweight loss increases.
- The deadweight depends on the size of the market.
- (Posner, 1975) argue that the social cost of monopoly should include an area which might be large as the profit one, due to rent-seeking activities (waste of resources, lobbying, ...)
Monopoly: productive inefficiency

Monopoly

\[ P > MC \]
\[ P > \text{min of ATC} \]
Monopoly: productive inefficiency (cont’d)

- The additional welfare loss depends on productive inefficiency, due to higher costs.
- Managerial slack (principal-agent model)
- X-inefficiency (no Darwinian mechanism of selection)

➔Principal- agent model

Bellflamme, Peitz, *Industrial Organization: Markets and Strategies*, Cambridge University Press, 2010; Ch.2 (2.1.2)
Monopoly: dynamic efficiency (?)

Dynamic efficiency refers to the extent to which a firm introduces new products or new process of production.

- Schumpeter (1911, 1945)
- Arrow (1964)
- Monopolist might be dynamically inefficient because it has too little incentive to adopt new technologies, (replacement effect)

**Monopoly**: $MC = c_H$ and $\Pi_H$ introducing a process innovation by paying a fixed cost $F$, $MC = c_L < c_H$ and $\Pi_L > \Pi_H$

Incentive to innovate: $\Delta \Pi = (\Pi_L - F) - \Pi_H > 0 \rightarrow \Pi_L - \Pi_H > F$

**Bertrand oligopoly**: $MC = c_H$ and $\Pi_H = 0$ introducing a process innovation by paying a fixed cost $F$, $MC = c_L < c_H$ and $\Pi_L > 0$

Incentive to innovate: $\Delta \Pi = \Pi_L$

$\rightarrow \Pi_L (\text{oligopoly}) > \Pi_L - \Pi_H (\text{monopoly})$

*Ex-ante Monopoly is dynamically inefficient*
Monopoly: dynamic efficiency (?)

- However: competition stimulates innovation, *ex-ante*, but it cannot completely appropriate the benefits of innovation (*ex-post*)

  Bertrand case: innovative firm $MC = c_L$ and $\Pi_L > 0$, but without patent protection all the competitors may produce with the same level of costs. Therefore $P = c_L$ and $\Pi_L = 0$

  $\Rightarrow$ No firm has an incentive to innovate.

- *Market power has an important role in incentivating firms to innovate, introduce new goods and improve quality.*
R&D and competition
Contestable markets

Contestable market theory (Baumol, Panzar, Willig (1982))

→ Monopoly power is likely to be temporary since the existence of profit would attract the entry of new firms and erode market power.

HP:
- Incumbent monopolist, potential entrant
- Homogeneous product
- Technology equally accessible
- \( C_I = C_E = F + cq \)

\[
P^* = \frac{F}{q} + c < P_M
\]

- If \( P^* > \frac{F}{q} + c \) entry
- If \( P^* < \frac{F}{q} + c \) losses
Contestable markets: comments

Monopoly $\rightarrow$ socially efficient output

But,

- Monopoly would change its price when it does not face competition
- Entry depends on the level of $F$. No *sunk costs* to start production in a new sector.

$\rightarrow$ The theory C.M. requires there are zero sunk costs otherwise the «hit-and-run» strategy would not be possible.