

Production: The Case of One Producer

Economics II: Microeconomics

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- Consumers:
 - People.
 - Households.
- Firms:
 - Optimisation ← Now
 - Monopoly.
 - Oligopoly.
 - Perfect competition.
- Equilibrium:
 - Holds.
 - Does not hold.

Optimisation

Assumption: Firms maximise their profit

- $\pi = \text{revenue} - \text{cost}$

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Monopolist

Market Structure

Definition

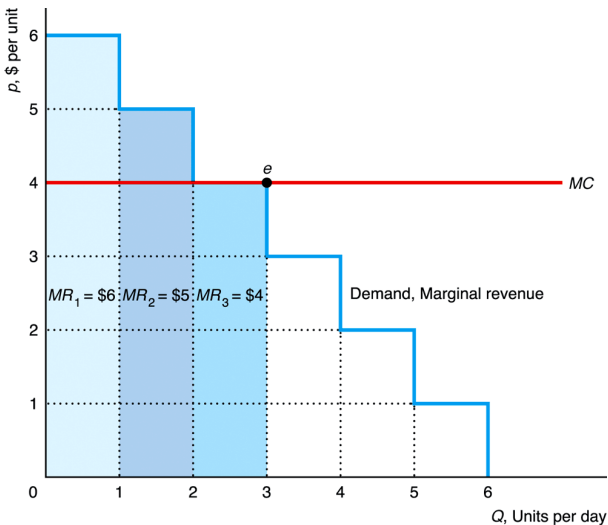
A situation where a market is dominated by a single seller of a product is known as a **monopoly**.

Fact

The monopolist (the sole producer) faces market demand, and thus, has to choose the price and produce the demanded quality (or vice versa).

Monopolist

Assumption: Perfect discrimination ability



Monopolist

Assumption: Arbitrage pricing

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Monopolist

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$$\begin{aligned}MR &= p(q) \cdot \frac{\partial q}{\partial q} + q \cdot \frac{\partial p(q)}{\partial q} \\&= p(q) + q \cdot \frac{\partial p}{\partial q} \\&= p(q) \left[1 + \frac{q}{p} \cdot \frac{\partial p}{\partial q} \right]\end{aligned}$$

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- $$MR = p(q) \left[1 + \frac{1}{\varepsilon_p(q)} \right] = p(q) \left[1 - \frac{1}{|\varepsilon_p(q)|} \right] = MC$$

Monopolist

Pricing rules

$$MC = p(q) \left[1 - \frac{1}{|\varepsilon_p(q)|} \right]$$

$$p(q) = \frac{MC}{\left[1 - \frac{1}{|\varepsilon_p(q)|} \right]}$$

Lemma (Pricing Rule 1: The Elasticity Rule for Monopoly Pricing)

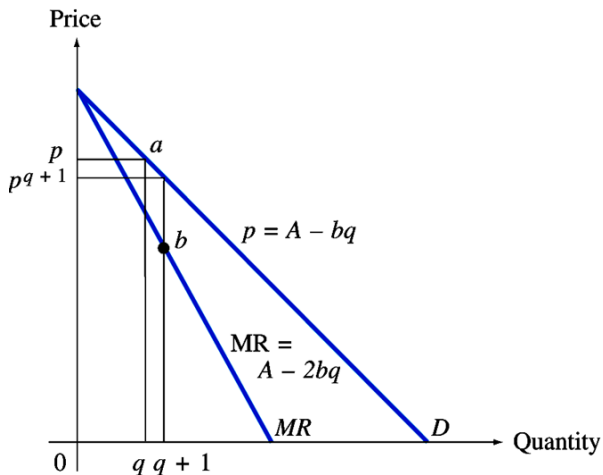
Never price on the inelastic portion of the demand curve.

Lemma (Pricing Rule 2: Markup Pricing)

The optimal price for a monopolist is the price that is on the demand curve at the optimal quantity point.

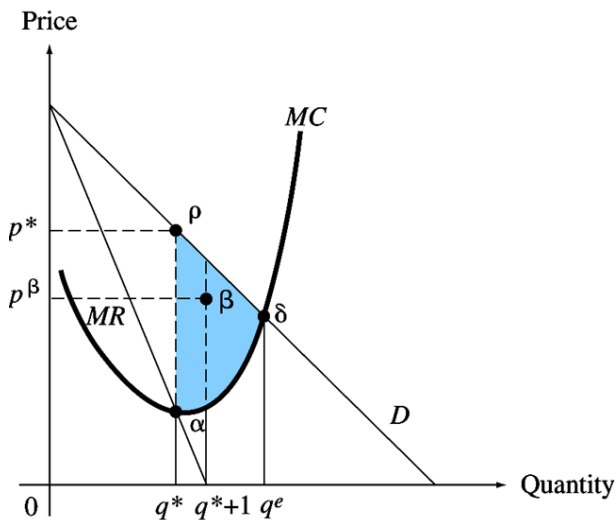
Monopoly Pricing Rule

Linear demand example



Monopoly Pricing Rule

Linear demand example



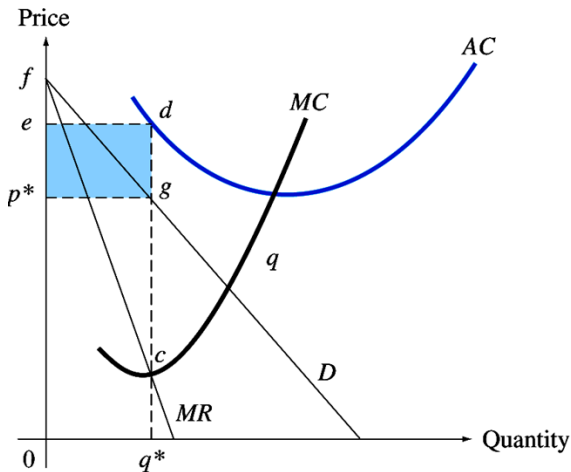
Monopoly Pricing

Profit

$$\begin{aligned}\pi &= p(q^*)q^* - C(q^*) \\ &= p(q^*) \cdot q^* - AC \cdot q^* \\ &= (p(q^*) - AC) \cdot q^* \\ \pi > 0 &\iff p > AC\end{aligned}$$

Monopoly Pricing

Profit



The producer cannot operate profitably as $p < AC$. The profit is negative and is represented by the rectangle $edgp^*$

Problem

Why do monopolies emerge?

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Why do monopolies emerge?

Solution

Among others:

- *Minimum efficiency scale and Natural monopoly*
- *Inertia shopping and Contestable markets*
- *Governmental licences and historical reasons*
- *Cartels*

Monopoly

Natural Monopoly

Definition

A **natural monopoly** is a monopoly that develops because the cheapest way to produce any given level of output in this market is to have one firm to do it.

Definition

A **cost function is subadditive** if

$$C(q) < C(q') + C(q'')$$

for all levels q , q' and q'' , such that $q = q' + q''$.

Monopoly

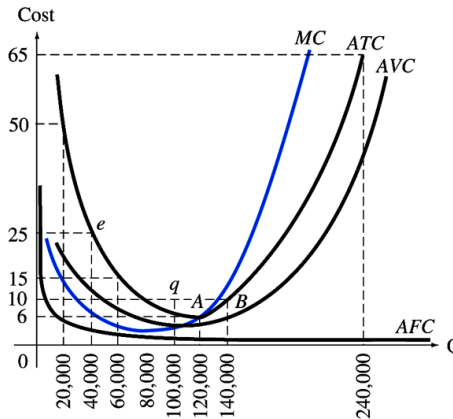
Natural Monopoly and Minimum efficiency scale

Definition

Minimum efficiency scale (MES) is the level of output that minimizes average cost.

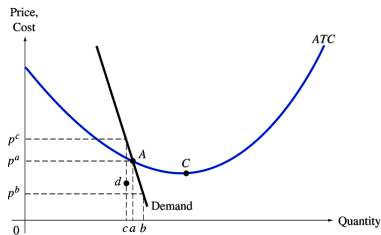
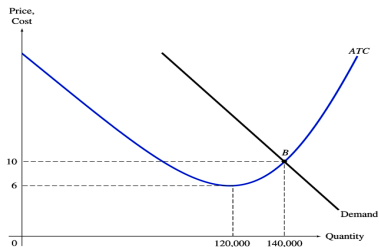
Fact

For the monopoly to emerge the MES should be small relative to the size of demand.



Monopoly

Sustainable Monopoly



Definition

A Natural monopoly that has a cost function $C(q)$ and faces demand function of $D(p)$ is sustainable if there is a price of p and an output of q such that

- 1 at any price the firm satisfies all the demand in the market:

$$q = D(p)$$

- 2 covers its cost:

$$p \cdot q = C(q)$$

- 3 a competing firm will incur loss if enters to the market:

$$p' \cdot q' < C(q')$$

for all $p' < p$ and $q' \leq D(p')$

Monopoly

Sustainable Monopoly

Fact (technical)

A natural monopoly is sustainable if, for an output of q , average costs are declining at every level up to that quantity.

Fact (intuitive)

A sustainable price-output combination must be a point at which the demand curve intersects the average cost curve.

Problem

Why do monopolies price the commodities higher than the average costs?

Monopoly

Historical incumbent and Inertia-shopping rule

Example

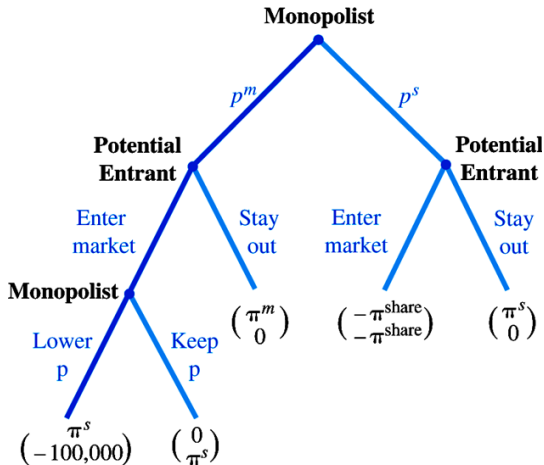
There is an incumbent in the market. The potential entrant will suffer sunk costs once enters the market. And the consumers follow the inertia shopping rule. Incumbent has to decide whether to set monopolistic or sustainable price. Potential entrant decides. Incumbent, observing entrant's decision chooses new price or keeps the same.

Definition (Inertia-shopping Rule)

Buy from the firm that charges the lowest price, but if you are already buying from a firm and another firm enters the market and offers you a lower price, give your current firm a chance to meet the entrant's price before shifting.

Monopoly

Historical incumbent and Inertia-shopping rule



The rest is not covered!

Monopoly

The Contestable Markets

Example

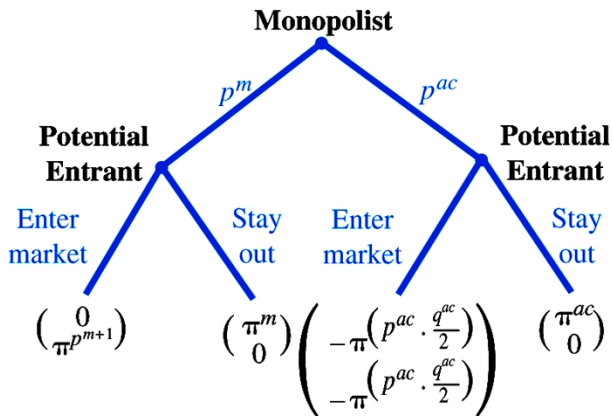
There is an incumbent in a contestable market. The consumers have no loyalty to sellers. The entrants can use hit-and-run strategy, i.e. enter with lower price, make profit, and go out of the market (with little costs) once the incumbent decreases his price.

Definition

A market that competitors can easily enter and leave is known as a **contestable market**.

Monopoly

The Contestable Markets

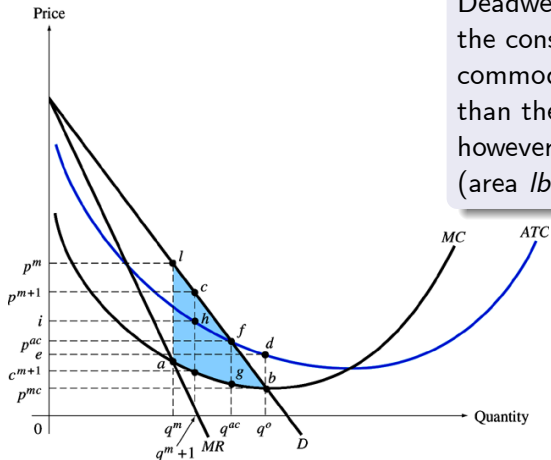


Monopoly

Deadweight loss and Government regulation

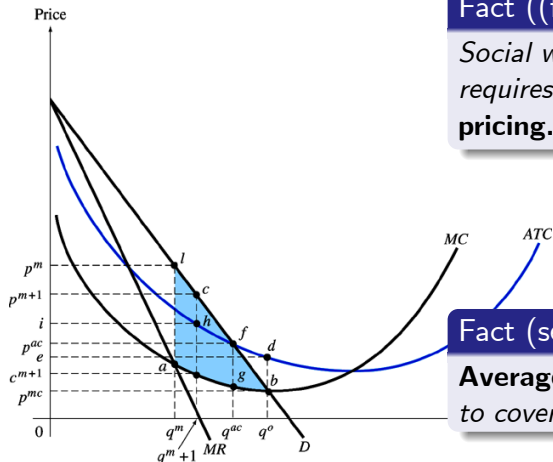
Definition

Deadweight loss occurs when the consumers demand commodity with higher price than the costs of production, however it is not produced (area lba).



Monopoly

Deadweight loss and Government regulation



Fact ((first-) best result)

*Social welfare maximisation requires **marginal-cost pricing.***

Fact (second-best result)

Average-cost pricing is used to cover the total costs.