

Lecture 4

Market power – part II



microeconomics II
first module

Important notes

- * **Homework 2** will soon be available
- * **Office hours** today 14:00 – 16:00

Pricing: monopoly vs. PC

* Monopoly

$$p > MC$$

price exceeds MC by an amount that depends inversely on the **elasticity** of demand

* Perfect Competition

$$p = MC$$

demand for the firm is **perfectly elastic** at $p = MC$

Monopoly and elasticity

- * If $|\varepsilon_d| > 1$ for the entire range of demand, there is **little benefit** to being a monopolist
the larger the elasticity, the closer to a perfectly competitive market
- * However, a monopolist will never **limit production** at the **inelastic portion** of demand curve ($|\varepsilon_d| < 1$)
- * At the inelastic portion

$$\frac{dQ}{Q} < \frac{dp}{p}$$

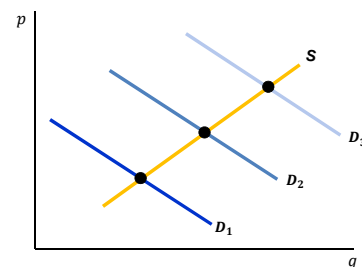
the monopolist, can **increase revenue** by increasing p and decreasing q (and also cost), till $|\varepsilon_d|$ exceeds 1

Supply curve in monopoly

- * In PC, the market supply curve is determined by **marginal cost**
- * How is the supply curve of a **monopoly**?
- * For a monopoly, optimal output is determined by **marginal cost** and the **shape of the demand** curve
there is **no supply curve** for monopolistic market

Shifts in demand in PC

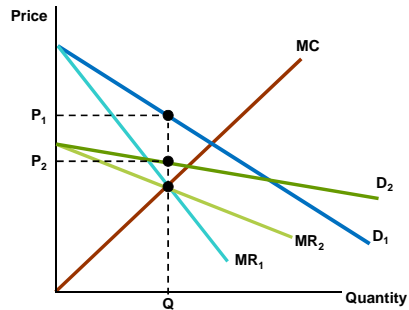
- * In PC, shifts in demand **trace out** price and quantity changes corresponding to a **supply curve**



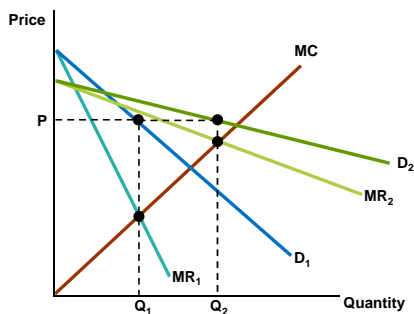
Shifts in demand in monopoly

- * In monopoly, shifts in demand may lead to
 - ◆ Changes only in **price** (no change in output)
 - ◆ Changes only in **output** (no change in price)
 - ◆ Changes in **both** price and quantity
- * Monopolistic market differs from perfectly competitive market
 - ◆ Competitive market supplies **specific quantity at every price**
 - ◆ This "1 to 1" relationship **does not exist** for a monopolistic market

Shifts in demand – same quantity



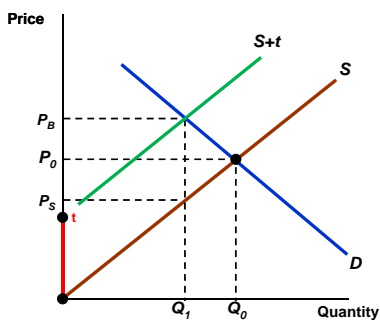
Shifts in demand – same price



Taxation

- * Consider a **specific tax** on a good sold in a perfectly competitive market
 - a **fixed** ruble amount **over the price** of the good
- * The per-unit tax causes price to rise by **less than the tax**
 - the tax burden is **split** between the consumer and the producer

A specific tax in PC

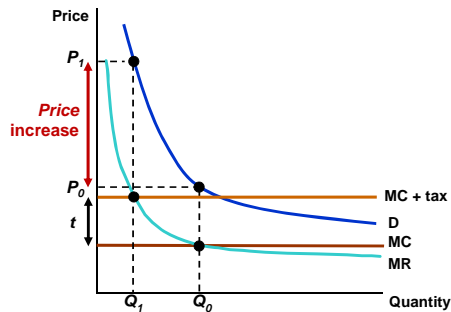


Taxation to a monopoly

- * How is a tax going to affect a monopolistic market?
- * A fixed tax will **affect the MC** of the firm

$$MC' = MC + t$$

Fixed tax on monopolist – graph



Effect of fixed tax on monopolist

- ★ The amount the price increases due to the tax **depends** on **elasticity of demand**
- ★ Price **may** or **may not** increase by more than the tax
- ★ **Profits** for monopolist will **fall** with a tax
- ★ In a competitive market, the price **cannot increase** by more than tax

Multi-plant monopoly

- ★ For some firms, production takes place in **more than one plant**
- ★ What if each plant has **different costs**?
- ★ How will the firm **distribute production** between both plants?
 - ◆ $MC_1 + MC_2 = MR$?
 - ◆ $MR = \min MC$?
 - ◆ $MR = \log(MC_1 + MC_2/3.14) - 7/8$?

Profit maximization in plant 1

- ★ Consider a firm who owns **two plants** with **cost** $C_1(q_1)$ and $C_2(q_2)$
- ★ **Demand** for the good is $p(q_1 + q_2)$
- ★ Let's set up the **profit** function

$$\Pi = p(q_1 + q_2) \cdot (q_1 + q_2) - C_1(q_1) - C_2(q_2)$$
- ★ **Maximizing** with respect to q_1

$$\frac{\partial \Pi}{\partial q_1} = \frac{\partial [p(q_1 + q_2) \cdot (q_1 + q_2)]}{\partial q_1} - \frac{\partial C_1}{\partial q_1} = MR - MC_1 = 0$$
- ★ Thus, profit maximizing **condition** is $MR = MC_1$

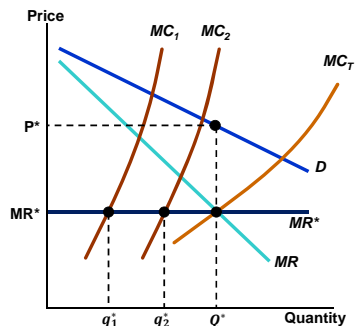
Profit maximization with 2 plants

- ★ We can show **the same** for plant 2

$$MR = MC_2$$
- ★ Therefore, we can conclude that the firm should choose to **produce** where

$$MR = MC_1 = MC_2$$
- ★ Lets see it graphically...

Production with two plants



- ★ $MR = MC_T$ gives total output
- ★ This point shows the MR^* for each plant

$$MR^* \text{ crosses } MC_1 \text{ \& } MC_2 \text{ at the profit maximizing output for each plant}$$

Example – producing an additional unit

| Q | TC ₁ | TC ₂ | Q _{total} | Q ₁ | Q ₂ | TC |
|---|-----------------|-----------------|--------------------|----------------|----------------|----------|
| 1 | 1 | 3 | 1 | 1 | 0 | 1 |
| 2 | 2 | 4 | 2 | 2 | 0 | 2 |
| 3 | 3 | 5 | 3 | 3 | 0 | 3 |
| 4 | 5 | 7 | 4 | 4 | 0 | 5 |
| 5 | 7 | 9 | 5 | 5 | 0 | 7 |
| 6 | 11 | 13 | 6 | 5 | 1 | 7+3 = 10 |
| 7 | 20 | 32 | 7 | 5 | 2 | 7+4 = 11 |

- ★ You want to **start using** your least effective plant as the increase in production causes your effective plant to hit the **diseconomies** of scale.^^

Market power with more than one firms

- ★ **Market power** is the ability of charging $p > MC$
- ★ This can happen **even** if the firm is **not alone** in the market
- ★ A firm has market power when **it faces** a **downward sloping** demand curve
- ★ Pure monopoly is **rare** but its **principles** can be applied to firms that **possess some market power**.^

Assessing market power

- ★ We **measure** market power by the extent to which **price exceeds the MC**
- ★ For this purpose, we use the **Lerner's index**

$$L \equiv \frac{p - MC}{p}$$

the **larger** the index the greater the power

- ★ Recall that

$$L = \frac{1}{\varepsilon_d}, \quad \varepsilon_d: \text{ for the firm.}^{\wedge}$$

Market power and profits

- ★ Market power **does not guarantee** profits
- ★ Profit depends on **average cost** relative to **price**
- ★ A firm may have **more market power** but **lower profits** due to high average costs. ^

Supermarkets & convenience stores

Supermarket

- ◆ Cheaper **prices**
- ◆ Takes more **time** to shop
- ◆ **Far** away from customers
- ◆ Store **elasticity** -10
- ◆ **Markup** calculated to 10%

Convenience store

- ◆ More **expensive**
- ◆ **Quicker** service
- ◆ **Closer** to customer
- ◆ Store **elasticity**, near -5
- ◆ **Markup** much higher, 20%

- ★ Convenience store has **more market power** higher **profit margin** than supermarket
- ★ Supermarkets have usually **higher profit**, however **higher volume** of sales and **lower AC**.^

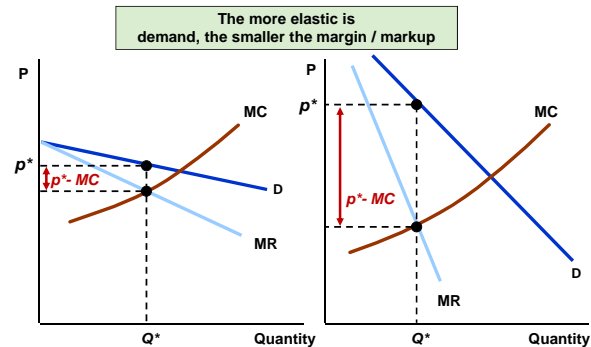
The rule-of-thumb revisited

- ★ Optimal pricing for **any firm** with market power

$$p = MC \cdot \left(1 - \frac{1}{\varepsilon_d + 1} \right)$$

- ★ Now ε_d is the elasticity of demand **for the brand**
 - ◆ **Elastic** products will have a **low** markup
 - ◆ **Inelastic** products will have a **high** markup. ^

Elasticity and profit margin / markup



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Creating market power

- * Make your product **better**
differentiate your product so that consumers cannot *substitute it easily* with other products
- * Close the **door** behind you
 create **barriers to entry** so that potential competitors will keep out of your profits
- * **Kill** the competition
 - ◆ Not literally!
 - ◆ Apply strategies that can constrict the competition and **drive rivals out** of business.

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Sources of market power

- * **Why** do some firms have considerable market power, and others have **little or none**?
- * Market power is determined by ability to set price higher than marginal cost
 - ◆ This is affected by the **firm's elasticity of demand**
 - ◆ The **less elastic** its demand curve, the more market power a firm has
- * The firm's elasticity of demand is **determined by**:
 - ◆ Elasticity of **market demand**
 - ◆ **Number of firms** in market
 - ◆ The **intensity of competition** among firms.

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1. Elasticity of market demand

- * With one firm, the market demand and the firm's demand curve **coincide**
 market power is determined **completely** by elasticity of market demand
- * With more firms, individual demand **will differ** from market demand
- * Demand for a firm's product is **more elastic** than the market elasticity
- * **Why?**

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2. Number of firms

- * The market power of a firm **falls** as the number of firms **increases**; all else equal
 - ◆ More important are the number of firms with **significant market share**
 - ◆ Market is **highly concentrated** if only a few firms account for most of the sales
 - ◆ Incumbent firms would like to create **barriers to entry** to keep new firms out of market.

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3. Intensity of competition

- * Firms can be **aggressive** in gaining market share
 undercutting, offers, aggressive R&D etc.
- * Then **prices** may **fall** close to **competitive levels**
- * In other industries firms **collude**
 agree to **moderate** competition
- * Firms can co-exist with **substantial market power**
- * Markets are **dynamic** and therefore, so is the concept of market power.

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Thank you!



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