

Lecture 2

Perfectly competitive markets



micro2
first module (m2)

Basic assumptions of PC

A market is perfectly competitive when

1. Firms are *many*
2. Product is *homogeneous*
3. Entry and exit are *free*.

Assumptions

1. Large number of firms

- ★ Firms are so many that cannot *meaningfully interact*
- ★ This assumption leads to *price-taking*
 - ◆ Each *firm* holds a tiny market share and its actions *do not affect* other firms
 - ◆ Price is set at the *market level* - the firm *cannot* affect it
 - ◆ That is, for the firm, price is considered *given*
- ★ What happens if the firm *deviates*?
- ★ Also, every *consumer* buys too small a share of industry output to have any impact on market price.

Assumptions

2. Product homogeneity

- ★ All products *have differences*
- ★ It matters how the consumer *perceives* the good
- ★ Heterogeneous products, such as brand names, can charge *higher prices* because they may be perceived as better.

Assumptions

3. Free entry and exit

- ★ Suppliers can easily *enter or exit* the market
 - ◆ There are no *special costs* that make it difficult for a firm to enter (or exit) an industry
 - ◆ There are *no prohibitions* in entering a market
- ★ Buyers can easily *switch* from one supplier to another.

Profit maximization in general

- ★ Lets see the math first:

$$\Pi = R - C$$

- ★ The FOC for this expression is

$$\frac{d\Pi}{dq} = \frac{d(R - C)}{dq} = \frac{dR}{dq} - \frac{dC}{dq} = MR - MC = 0$$

- ★ This yields the *generalized* profit maximization condition

$$MR = MC$$

under *any market structure*, profit is maximized when the cost for producing an extra unit equals the revenue from this unit.

Profit maximization in PC

- ★ Under perfect competition the price is **constant**
- ★ So, the **revenue** is

$$R = \bar{p} \cdot q$$

- ★ Thus, marginal revenue (MR) is

$$\frac{dR}{dq} = \frac{d(\bar{p} \cdot q)}{dq} = \bar{p} \frac{dq}{dq} = \bar{p}$$

- ★ So, under PC the profit maximizing condition becomes

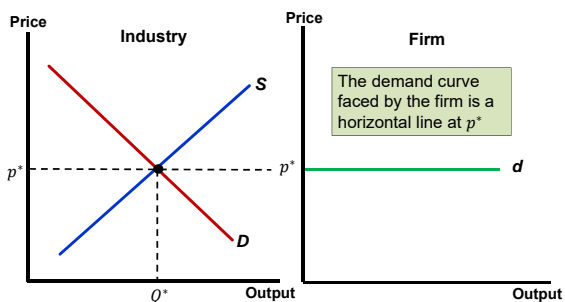
$$p = MC$$

under PC, profit is maximized when the cost for producing an extra unit equals the (given) price.

Demand for a PC firm

- ★ **Demand curve** faced by an individual firm is a horizontal line
firm's sales have **no effect** on market price
- ★ **Demand curve** faced by the whole market is downward sloping
shows quantities *consumers* will purchase at different prices.

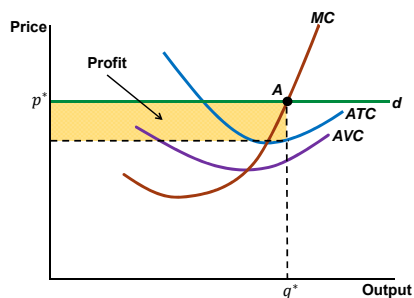
Demand for a PC firm (graphs)



Choosing output: Short-Run

- ★ We will need to **combine** the **demand** with the **cost** structure of the firm in the same graph in order to investigate the **decision about q^***
- ★ In the Short-Run, **capital is fixed** and firm must choose levels of **variable inputs** to maximize profits
- ★ We can look at the **graph** of MR, MC, ATC and AVC to determine profits.

A competitive firm in the S-R



Stability of the S-R equilibrium

- ★ Assume that $MR=MC$ when the PC firm produces q^*
- ★ This means that q^* **maximizes** the firm's profit
- ★ If the firm produces any $q < q^*$

$$MR > MC$$
more profit could be gained by **increasing output**
- ★ If the firm produces any $q > q^*$

$$MR < MC$$
decreasing output will increase profits.

When should the firm shut down?

- ★ A firm is producing **chairs**
 - ◆ 1 worker for \$80 / day with 1-year contract
 - ◆ \$10 worth of materials per chair (wood, etc.)
- ★ The worker makes 10 chairs per day



$$AC = \frac{80}{10} + 10 = \$18$$

- ◆ For $p > 18$ the firm has profit
- ◆ For $p < 18$ the firm has losses – Should it **shut down**?
- ★ For $10 < p < 18$ the firm **covers** its AVC and parts of FC
 - ◆ If it shuts down it will have to pay the FC **from its pocket**
 - ◆ Keep operating till the **contract** with the worker expires

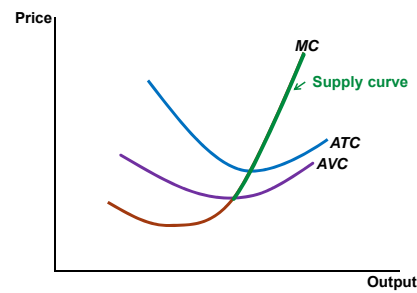
Losses and shut down

- ★ It is not rare that at a given market price, a firm will incur **losses** that is, when $p < AC$
- ★ If $AVC < p < AC$, the firm should **continue** producing in the short-run
 - operation allows to cover all of variable costs and part of fixed costs
- ★ If $p < AVC < AC$, the firm should **shut down**
 - operation makes the situation worst – cannot even cover variable costs

S-R supply

- ★ Supply curve tells **how much output** the firm will produce at different prices
- ★ Competitive firms **produce the quantity** where $p = MC$
- ★ Also, **shut down** when $p < AVC$
- ★ The competitive firm's **supply curve** is the portion of the MC curve above the AVC curve

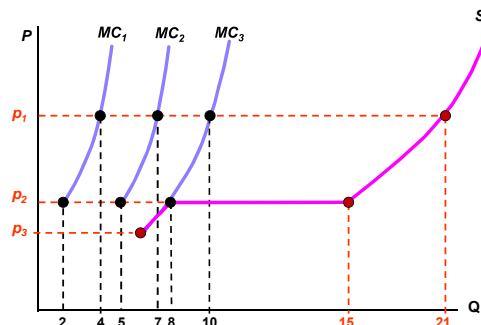
S-R supply curve



Market supply for the S-R

- ★ Shows the amount of output the **whole market** will produce at given prices
- ★ Is the **horizontal sum** of all the individual firms' supply curves in the market
 - adding quantities for each price
- ★ The **market** supply is more elastic than the **firm** supply curves

Market supply (graph)

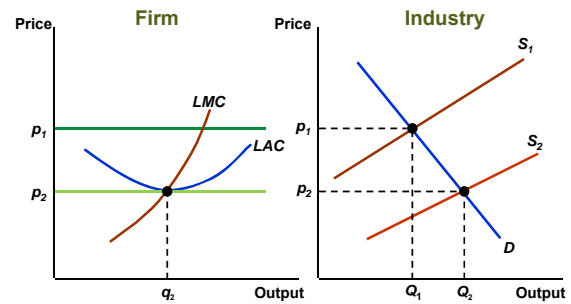


Long-Run Competitive Equilibrium

- ★ For the long-run equilibrium, firms must have **no desire** to enter or leave the industry
- ★ Mobility in and out this industry will be eliminated when **economic profit vanishes**
- ★ When $\Pi = 0$, the owner of the firm is earning a **normal return** on his/her investment
 - normal return is firm's **opportunity cost** of using money to acquire the capital instead of investing elsewhere.

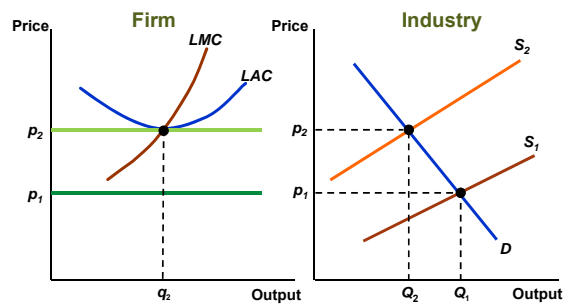
L-R Competitive Equilibrium – Entry

Equilibrium



L-R Competitive Equilibrium – Exit

Equilibrium



L-R equilibrium properties

Equilibrium

- ★ All firms in industry are **maximizing** profits

$$MR = MC$$
- ★ No firm has incentive to **enter** or **exit** the industry

$$\Pi = 0$$
- ★ Market is in **equilibrium**

$$Q_D = Q_S$$

Efficiency

- ★ A market is **efficient** when **nothing is lost** due to its function
 - if the function of the market creates **frictions**, the market is inefficient
- ★ All the **gains from trade** between the parties are **captured**
 - does it matter who captures them?

Measuring market efficiency

Efficiency

- ★ How can we **quantify an index** of economic efficiency?
- ★ How do we measure **inefficiency** in a specific market?
 - such measure of efficiency would be necessary to **evaluate government intervention** or policy.

Surplus

- ★ Surplus is the **benefit** beyond the minimum benefit required for a transaction to occur
 - ◆ I was willing to teach 3 courses per year in order to accept an offer from HSE
 - ◆ They offered me to teach just two
 - ◆ So, I am enjoying a surplus of 1 course less teaching load.

Consumer Surplus

- ★ **Consumer surplus** is the value consumers receive beyond what they actually pay for the good

$$CS = \left(\begin{array}{l} \text{How much you} \\ \text{are willing to pay} \end{array} \right) - \left(\begin{array}{l} \text{How much you} \\ \text{actually pay} \end{array} \right)$$

- ◆ **Willingness** to pay is measured by...?
- ◆ **Actual payment** is given by...?
- ★ CS measures the net benefit to consumers by the **area** between the demand curve and the market price.

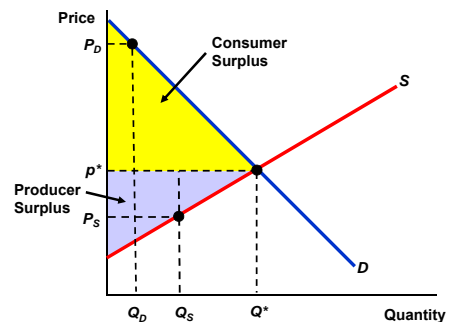
Producer Surplus

- ★ **Producer surplus** is the benefit producers receive beyond what it costs to produce a good

$$PS = \left(\begin{array}{l} \text{How much you} \\ \text{actually receive} \end{array} \right) - \left(\begin{array}{l} \text{How much you} \\ \text{are willing to sell} \end{array} \right)$$

- ◆ **Willingness** to sell is measured by...?
- ◆ **Actual payment** received is given by...?
- ★ Producer surplus measures the net benefit to producers by the **area** between the supply curve and the market price.

Consumer and Producer Surplus



Efficiency in a Competitive Market

- ★ From the previous figure it seems that **nothing is lost**
- ★ The total surplus is **gained by someone** in this market
- ★ Therefore, PC markets are **always 100% efficient**
- ★ Does this mean that **no failures** occur in PC? .

Market Failure

- ★ Sometimes, the **market system** may **fail**
 - ◆ **What** is a failure?
 - ◆ **How** can it occur if markets automatically **equilibrate**?
- ★ When the market fails:
 - ◆ Prices fail to **provide proper signals** to consumers and producers
 - ◆ The market is "**inefficient**" (in what sense?)
- ★ Government may **intervene** to fix the problem .

Types of market failures

- ★ **Externalities**
costs or benefits that *do not show up* as part of the market (e.g. pollution, systemic risks, antibiotic resistance, education)
- ★ **Asymmetry of information**
imperfect information prevents *efficient transactions* from happening
- ★ **Mechanism design** can induce failure
- ★ Government intervention may be desirable in all cases

Example

	Georgi	Olga
Plan A	10	10
Plan B	1	11

- ★ Which plan is *best*?
- ★ What if Olga alone *is deciding* about the plan?
- ★ What can we say about *efficiency*?

ευχαριστώ!
(thank you!)



WARNING

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