**PERFECT COMPETITION**

Different types of market structures can be classified basing on the number of producers and whether products are differentiated or not. If there is one producer, products cannot be differentiated, so products are homogeneous and there is a **monopoly**. If many producers work in a market and product are not differentiated (homogeneous), namely perceived by consumers are identical, we have a **perfect competition**. If there are many producers and products are differentiated there is a **monopolistic competition**. If there are few producers, there is an **oligopoly** both if products are differentiated or homogeneous. The number of producers defines whether firms are **price-takers** (observe the prices in the market and have no power of defining different prices) or **price-makers** (a single producer has the possibility of defining both quantity and price of output 🡪 monopoly). In reality, there is a continuous index that depends on the market share.

**PERFECT COMPETITION**

In a perfect competitive market there are **many sellers** that produce **homogeneous** goods for a **large number of buyers** with a **small market share**. Market share is the fraction of the total industry output accounted for by that producer’s output. The consequence of this in a competitive market is the fact that both **consumers** and **producers** are **price-takers**. The **products** are **standardized** (homogeneous) across sellers, namely consumers regard different sellers’ products as identical. There is **free entry** and **free exit**, so new producers can easily enter the market if there is the possibility of making positive profits and firms can easily leave the market if profits are low.

Given a firm operating in a competitive market (same amount of output for each seller), the main **determinant** of the optimal quantity produced is **profit**, since a producer decides to enter the market only if there is the possibility of making positive profits. Profits are the difference between total revenue (TR = P x Q) and total costs, so:

**Profit = TR – TC**

Therefore, each producer can decide which is the optimal quantity of output to maximize profit.

Considering the structure of cost and the amount of demand, it is possible to solve the optimal output problem through marginal analysis.

**Marginal revenue** is the **change in total revenue generated by an additional unit of output**.

**MR = ΔTR/ΔQ**

For price-taking firms, the marginal revenue is simply the good’s market price, where Q is a continuous variable (divisible in infinite parts) and in competitive markets nobody can set a price which is different from the market price.

According to the **optimal output rule**, **profit** is **maximized** by producing the quantity of output at which the **marginal revenue** of the last unit produced is **equal** to its **marginal cost** (**MR = MC**). In fact, each time the firm produces another unit, there are extra costs and extra revenues. If producing another unit adds more to revenue than cost, profit will increase. Because if MR > MC, producing more will add to profit (incentive to increase output) and if MR < MC, producing less will add to profit. Since MR = P for competitive firms, the **profit-maximizing rule** is: **choose the quantity of output where P = MC** (no incentive to modify the amount of output). Graphically, it is the intersection between the marginal cost curve and the market price.

Before applying the profit-maximizing principle of marginal analysis to determine how much to produce, a potential producer must answer an “either-or” question: should it produce at all? If the answer is yes, it then proceeds to a “how much” decision: maximizing profit by choosing the quantity of output at which marginal cost is equal to price. It depends on the cost structure and therefore on a comparison between total revenues and total costs, which tells us whether an activity is profitable or not. A firm’s decision to produce or not, to stay in business or to close down, should be based on economic profits:

* If **TR > TC**, the firm is **profitable** (obtaining positive profits).
* If **TR = TC**, the firm **breaks** **even** (the quantity produced covers exactly the costs of production).
* If **TR < TC**, the firm incurs a **loss** (negative profits).

**Profit = TR − TC = (TR/Q − TC/Q) × Q**

So

**Profit = (P − ATC) × Q**

**Break-even price** of a price-taking firm is the **market price** at which itearns **zero profit**.

In general,

* If the firm produces a quantity at which **P>ATC**, the firm is **profitable**.
* If the firm produces a quantity at which **P=ATC**, the firm **breaks even**.
* If the firm produces a quantity at which **P<ATC**, the firm incursa **loss**.

If the price is just high enough to cover ATC (ATC = P) and if it chooses the Q where  
MR = MC, the firm will break even.

At 50, market price is greater than ATC, so for each unit produced the firm earns $3.60. Multiplying it for 50, the total profit is $180 (positive profits).

The optimal quantity is 30, yet producing 30 is not profitable because ATC is greater than market price and therefore than marginal revenue. There is a per unit loss of 10 – 14.67 = -4.67. Multiplied for 30, the total loss is about $140.

In the short run (fixed inputs included in the analysis of costs), does loss mean that the firm has to immediately shutdown? No, because the fixed costs must be covered anyway, so producing 30 units is better than producing nothing because the firm has the incentive to cover the fixed costs at least in part, as well as all the variable costs. If the price is at or below the **shut-down price**, namely the **minimum average variable cost**, the firm will still have an incentive to stay open. In the short run, when the firm has still fixed costs to cover, the price that guarantees the existence of the firm is the shut-down price, which covers at least the variable costs. Instead, in the long run, the price must cover all the costs and if it does not happen the firm has to exit the market unless it is subsidized by the government.

In the short run individual supply curve, where P is variable, a firm will produce at every price above minimum AVC where price intersects the MC curve, but will stop producing in the short run if the market price falls below the shut-down price, so the **MC curve** (above shut-down price) is the **firm’s supply curve**. So, in this case, for all prices lower than 10 the firm will produce 0, while for prices greater than 10 the output defined by the supply curve will correspond to the MC curve. For P = 10, the firm will be indifferent between staying in the market or leaving.

To sum up, in the short run a firm will **produce if P > shutdown price (min AVC)**, while it will **not produce if P < min AVC**. **If P > break-even (min ATC),** firms are **profitable**. This profit attracts **new entrants**.

As for the industry supply curve, which is what we generally refer to as supply curve, we have to relate it to individual supply curves (of which it is the horizontal sum) and to market demand.

Considering an industry composed by 100 firms identical to the one analyzed before, the Q supplied by the industry depends on the market price, so higher prices mean that more firms are willing to supply.

At $18, the individual firm will make a profit equal to TR – TC, so , where . If new firms enter the market, there will be a positive shock in market supply curve. New firms have an incentive to enter the market as long as there is economic profit (P > min ATC).A new equilibrium will be defined (P=16; Q=45).

40 is the new breakeven price, at which the firm makes 0 profit. In fact, at the price of 14 the company would make 0 profits because 14 used to be the breakeven price. When there is no profit, new firms will have no incentive to enter the market.

The market is in the long run equilibrium when quantity supplied equals the quantity demanded given that sufficient time has elapsed for entry into and exit from the industry to occur. In this case, we have a long run market equilibrium because the supply curve adjusted to incentives given the market price. New firms enter the market up to the point at which each firm has 0 profit in the long run.

What happens if demand increases?

As for (b), the positive shock in the demand side is represented as a rightwards shift in demand, with a change in the market price from 14 to 18. In this case, there will be higher possibility to make profits (because the market price is higher than the breakeven price) and, since there is free entrance, new firms will enter the market, causing a positive shock of the supply side. The entrance of new firms will continue up to the point at which the market price will be equivalent to the breakeven price. Therefore, in the long run the original equilibrium will be restored and firms will go back producing the original quantity of output.

The long run industry supply curve will be more elastic than the short run one, since there will be more entrances and exits and this will lead to a higher sensitivity to changes in price, being more able to adapt and modify their cost structure.

A higher price attracts new entrants in the long run, raising industry output and lowering price.

A fall in price induces existing producers to exit in the long run, reducing industry output and raising price.