Essentials of Economics II II

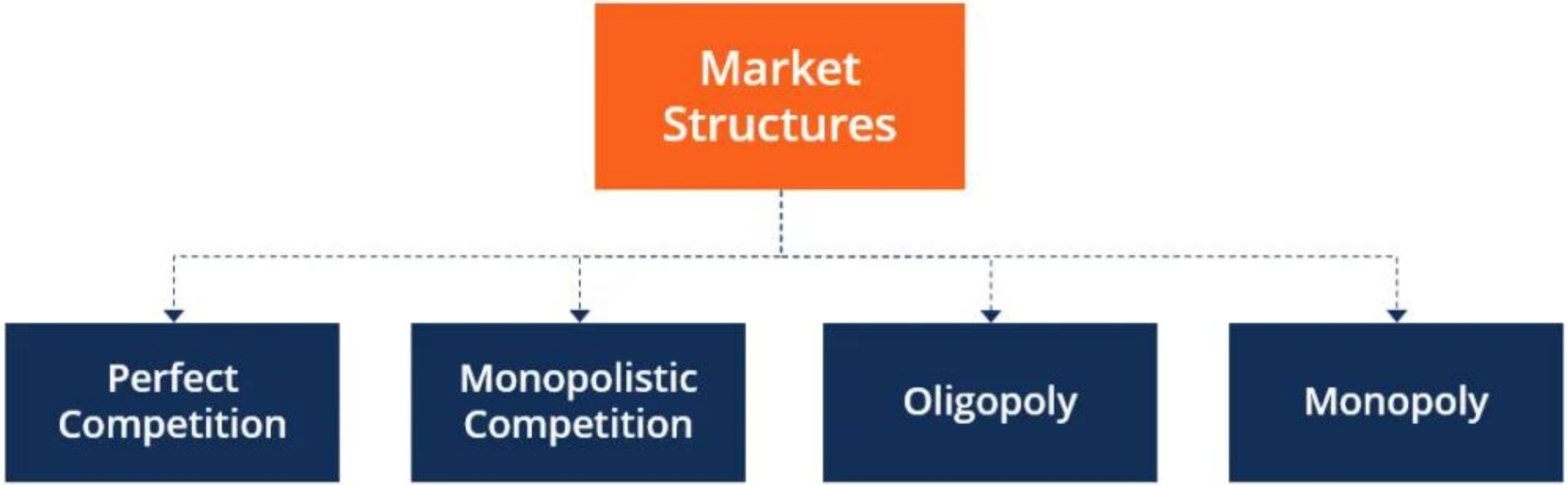
Chapter 1: Markets

Essentials of Economics II

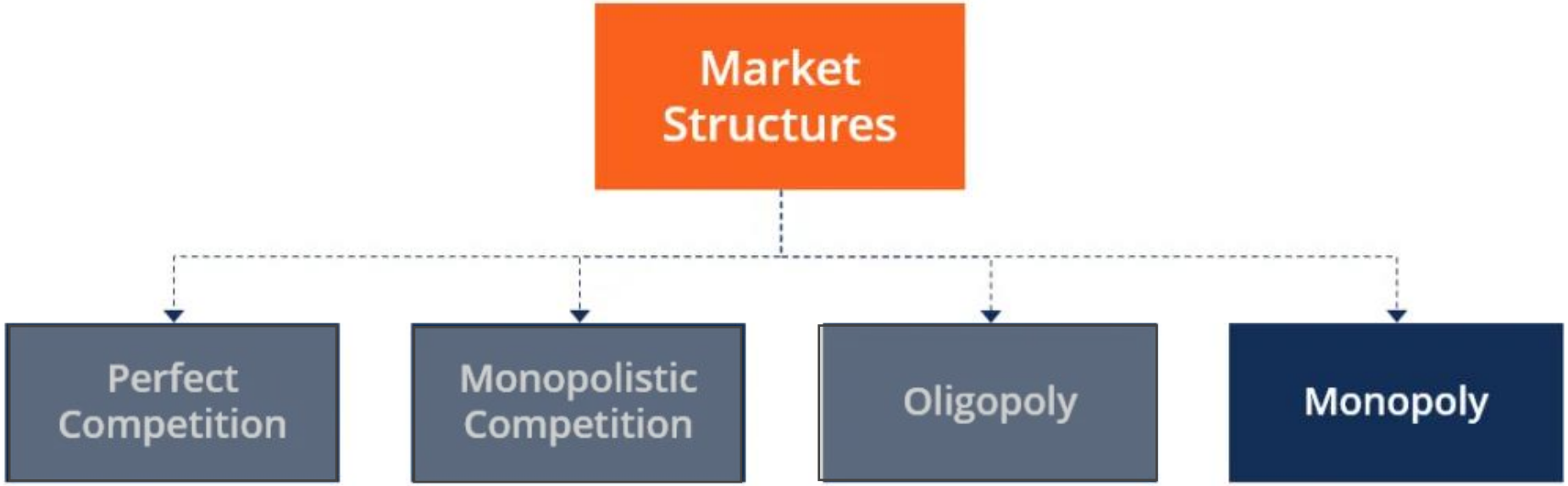
Ferdowsi University of Mashhad

Spring Term 2024

Markets


Market Structures
Perfect Competition
Monopolistic Competition
Oligopoly
Monopoly

Markets

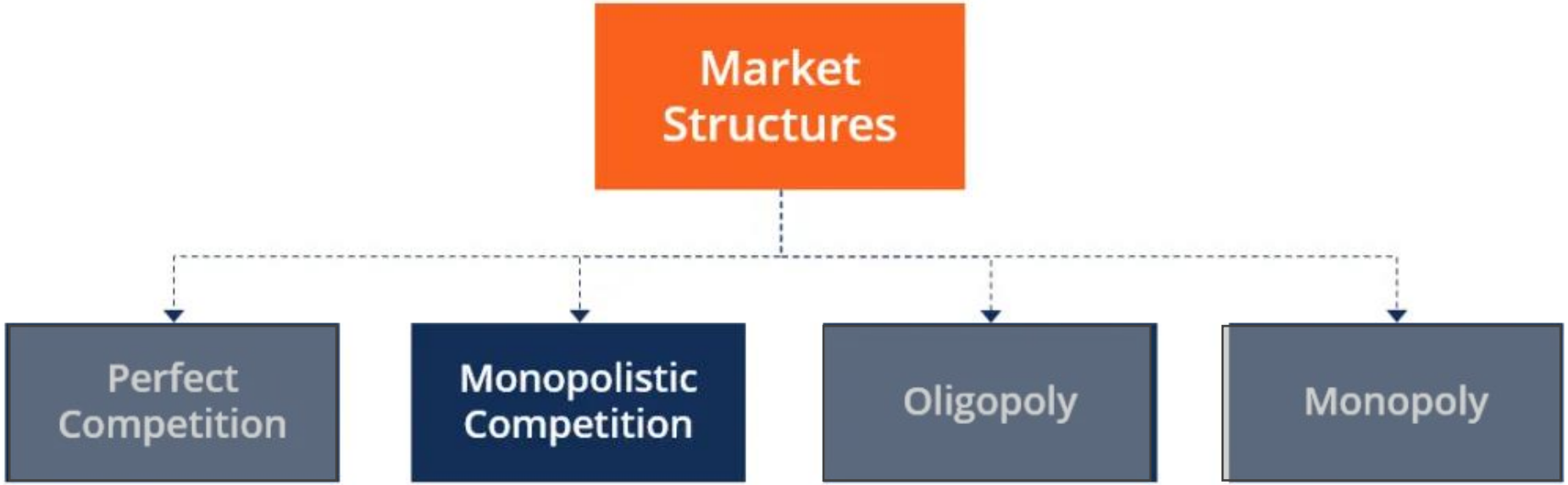


In a monopoly market, a single company represents the whole industry. It has no competitor, and it is the sole seller of products in the entire market. This type of market is characterized by factors such as the sole claim to ownership of resources, patent and copyright, licenses issued by the government, or high initial setup costs.

Markets

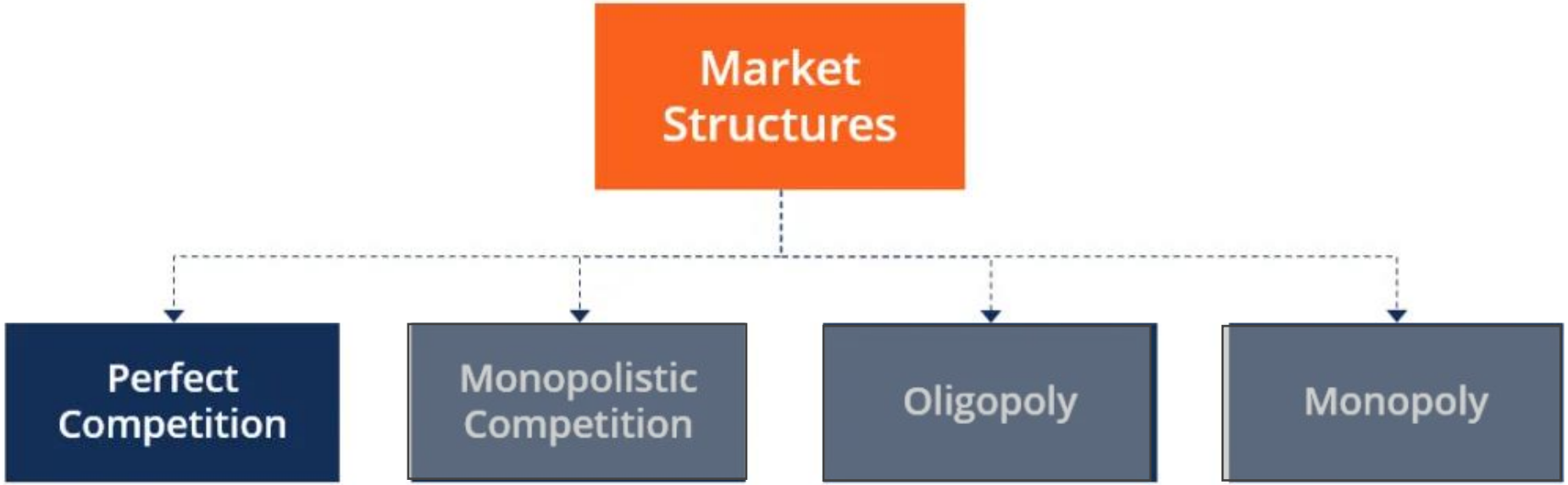
An oligopoly market consists of a small number of large companies that sell differentiated or identical products. Since there are few players in the market, their competitive strategies are dependent on each other.

Markets



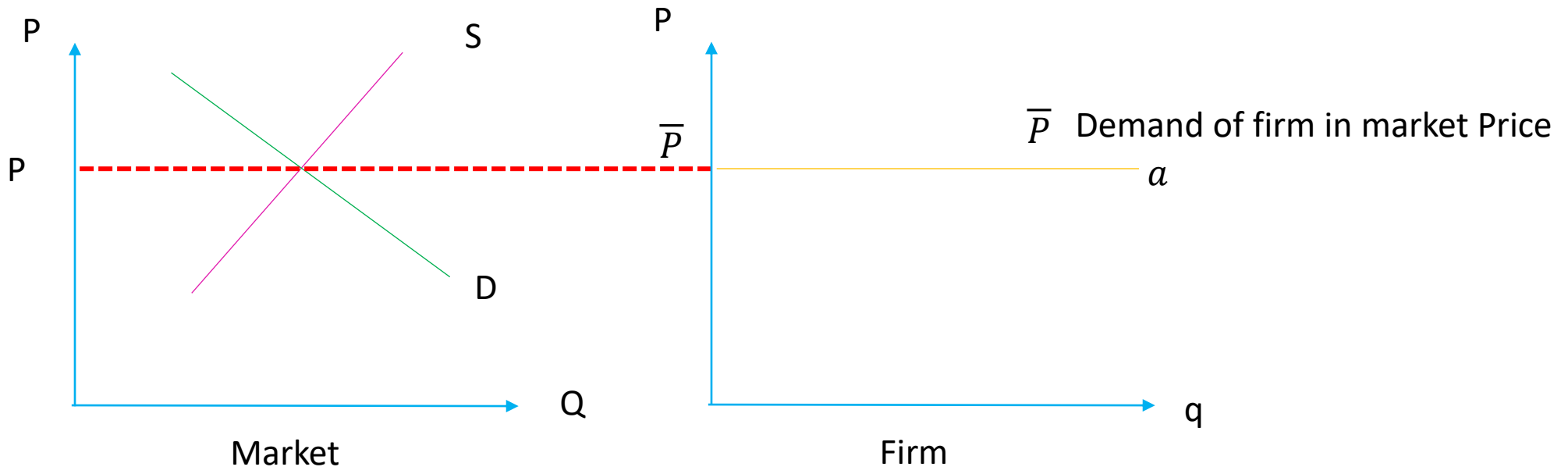
Monopolistic competition refers to an imperfectly competitive market with the traits of both the monopoly and competitive market. Sellers compete among themselves and can differentiate their goods in terms of quality and branding to look different. In this type of competition, sellers consider the price charged by their competitors and ignore the impact of their own prices on their competition.

Markets



Perfect competition occurs when there is a large number of small companies competing against each other. They sell similar products (homogeneous), lack price influence over the commodities, and are free to enter or exit the market.

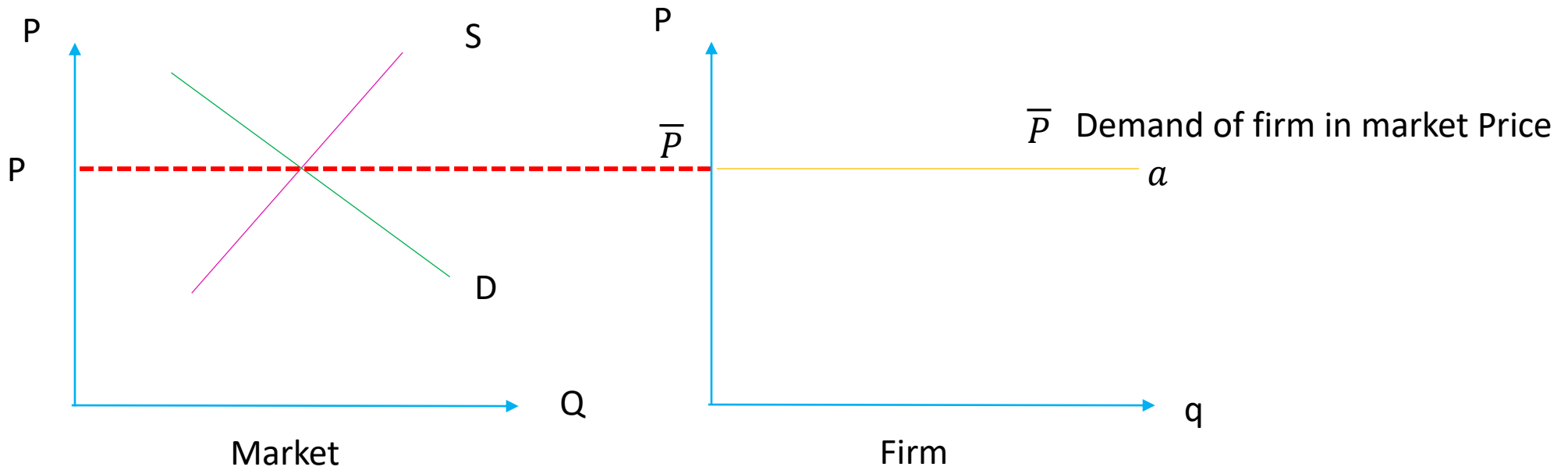
Markets, Perfect Competition



Therefore, the demand function is constant P=a and independent of the sales amount.

Demand curve is horizontal line with infinite price elasticity of demand.

Markets, Perfect Competition



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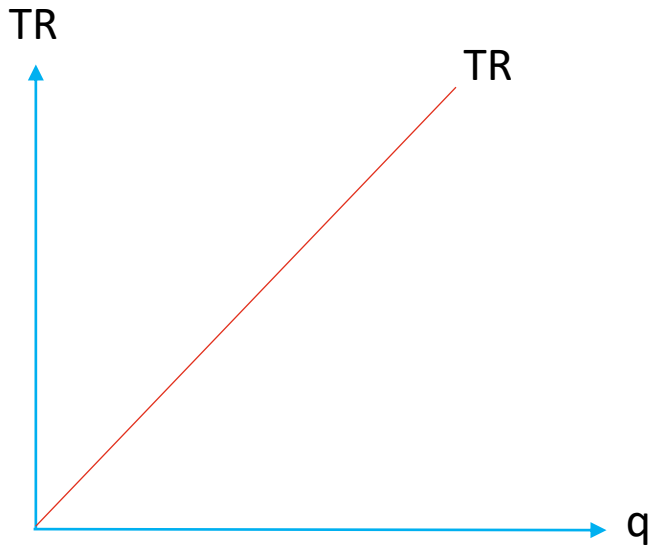
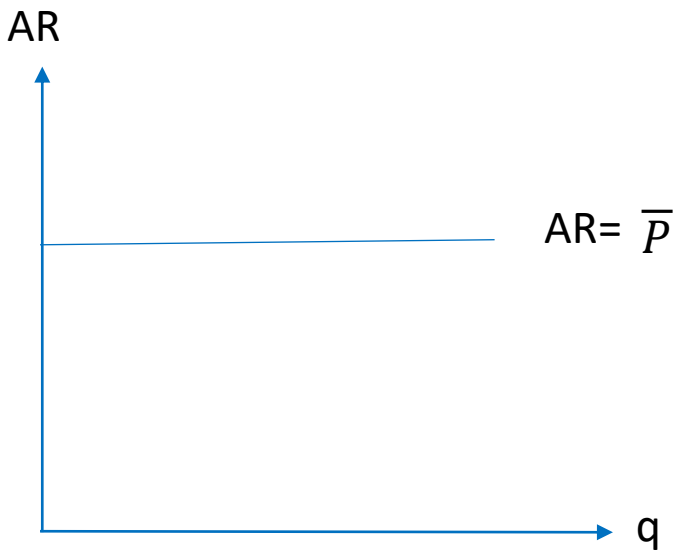


Total Revenue (**TR**)

$TR = P.q$

In the conditions of perfect competition, since the price of the product is fixed for the firm. The firm's total revenue curve will be a straight line with a constant price slope.

Markets, Perfect Competition

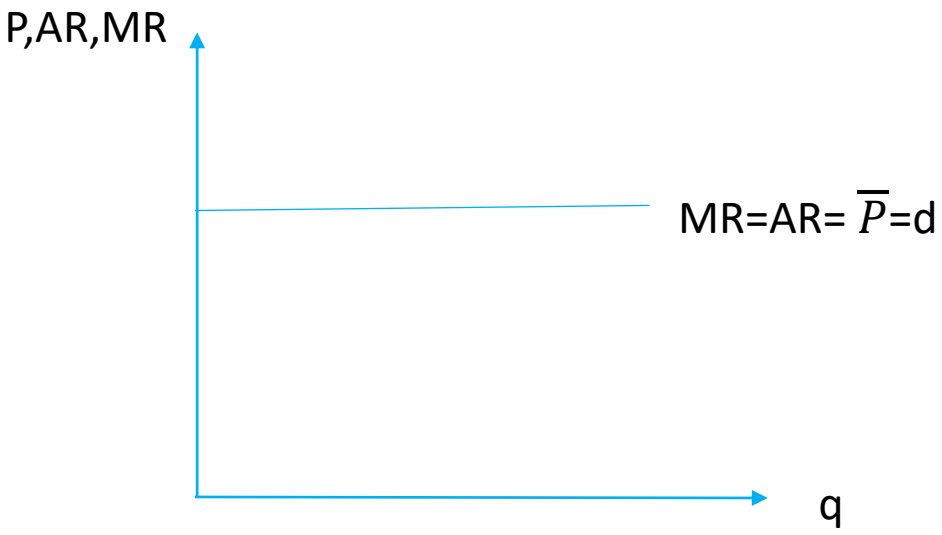


Average Revenue (**AR**)

$$AR = \frac{TR}{q} = \frac{P.q}{q} = P$$

In the conditions of perfect competition, because the selling price is fixed, the selling price is the same as the average revenue.

Markets, Perfect Competition



Marginal Revenue (**MR**)

$$MR = \frac{\Delta TR}{\Delta q} = \frac{dTR}{dq}$$

In the conditions of perfect competition, where the selling price of the product per unit of time is fixed for each company, the demand curve, average revenue and marginal revenue are consistent with each other.

Markets, Perfect Competition

Equilibrium in a perfectly competitive market:

- The goal of all manufacturing firms is to maximize their profits.
- On the other hand, in the **competitive market**, companies are price sensitive and cannot influence the price and increase or decrease it.
- That is, the price is obtained from the intersection of market supply and demand, and companies decide how much to produce based on this given price.
- In fact, P is constant for companies, and at that level of the equilibrium price, they can sell any number of goods, for this reason, the demand curve that every company faces for its manufactured goods is a horizontal line and has infinite elasticity.
- Due to the fixed price for the company, the company can only decide on its **production level** to maximize profit, that is, it must find the optimal production level for itself.
- For this purpose, we form the profit function and take the derivative with respect to the production level (Q) and set it equal to zero:

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Markets, Perfect Competition

Equilibrium in a perfectly competitive market:

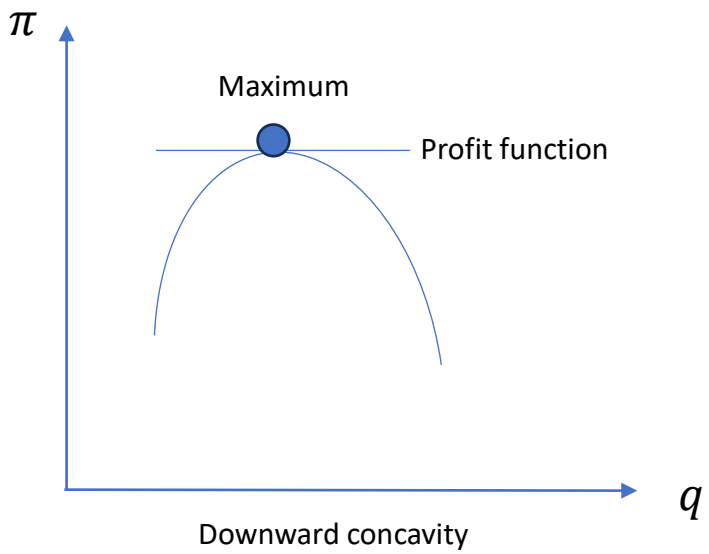
$$\pi = TR - TC$$

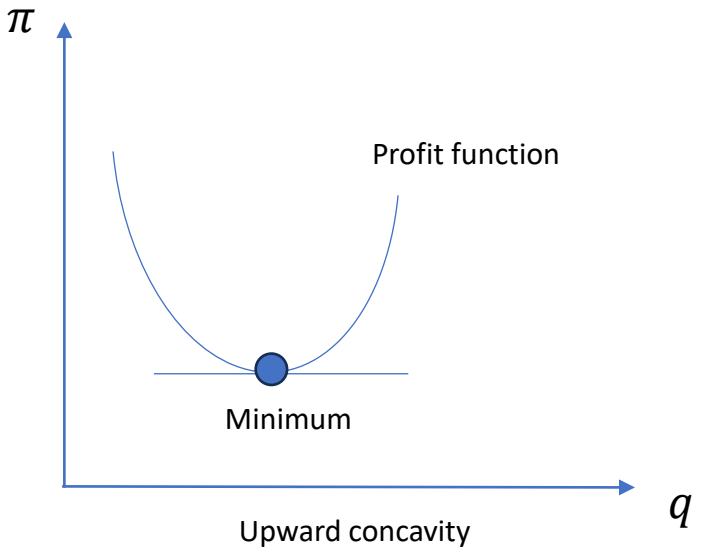
$$\pi_{max} = \frac{d\pi}{dQ} = 0 \rightarrow \frac{dTR}{dQ} - \frac{dTC}{dQ} = \frac{dP.Q}{dQ} - \frac{dTC}{dQ} = 0 \rightarrow P - MC = 0 \rightarrow P = MC$$

Markets, Perfect Competition

Equilibrium in a perfectly competitive market:

- So the company produces to maximize its profit at a point where the condition P=MC is satisfied
- This condition is the first or **primary condition**
- A sufficient condition is that the MC curve at the equilibrium point **should be upward sloping and not downward sloping** to maximize profit
- If the MC curve is downward at P=MC, the loss will be maximum.
- Mathematical proof is a sufficient condition that in order to maximize profit, the concavity of the profit **curve must be downward** so that the point where the first derivative is equal to zero is the maximum of the function, and if the concavity of the profit function is upward, the point where the first derivative is equal to Zero is the minimum point of the profit function.





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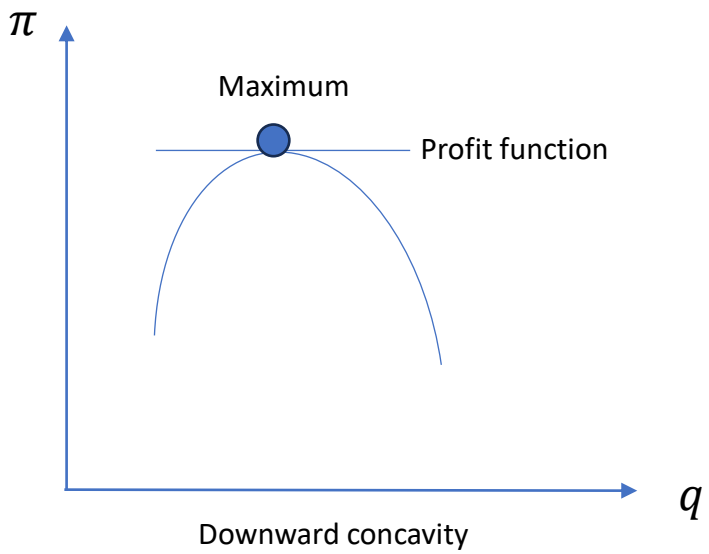

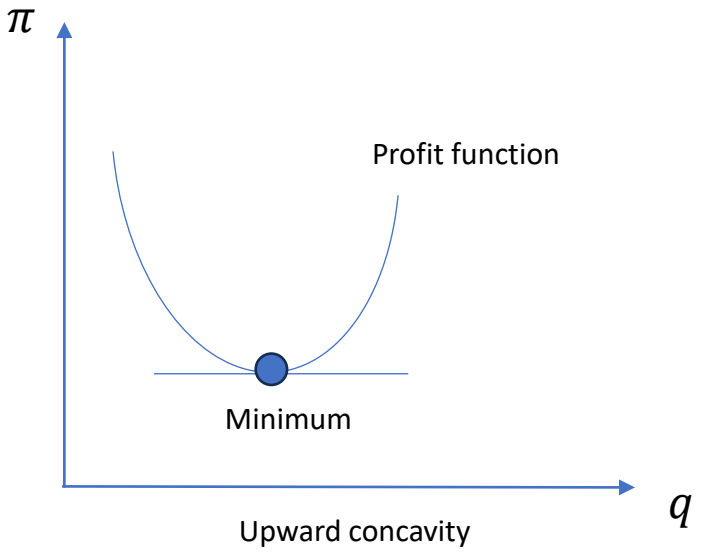

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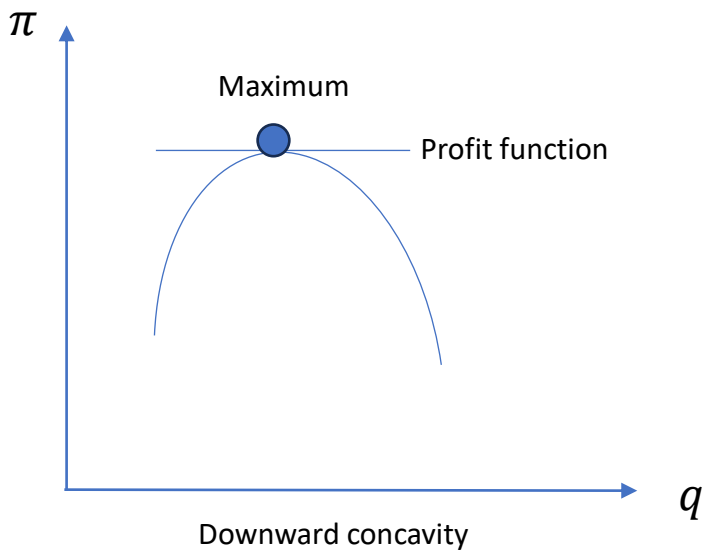

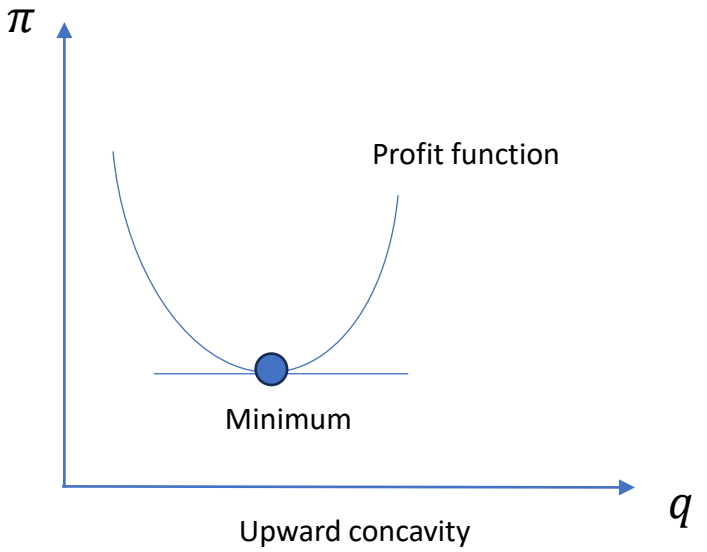

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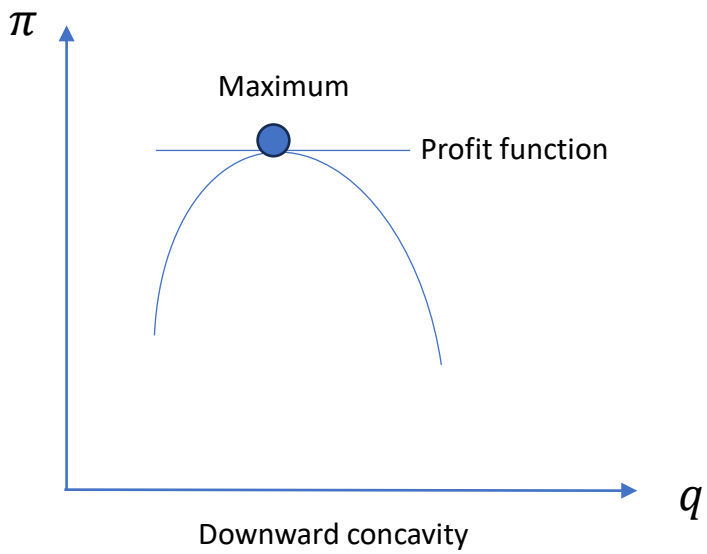

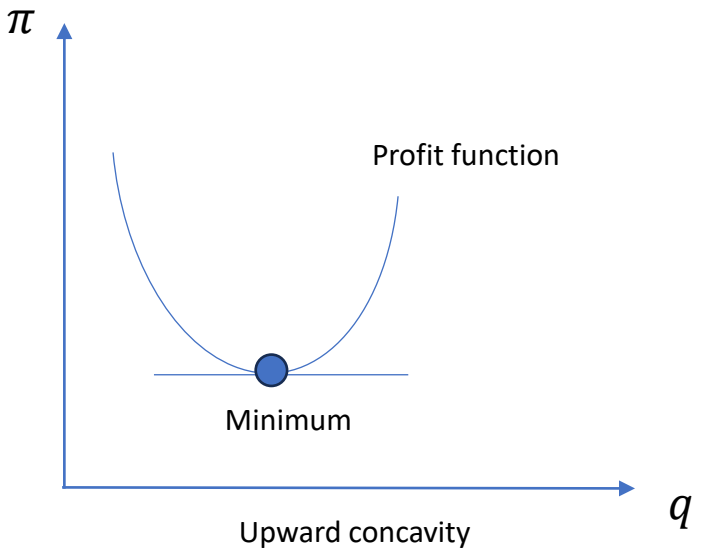

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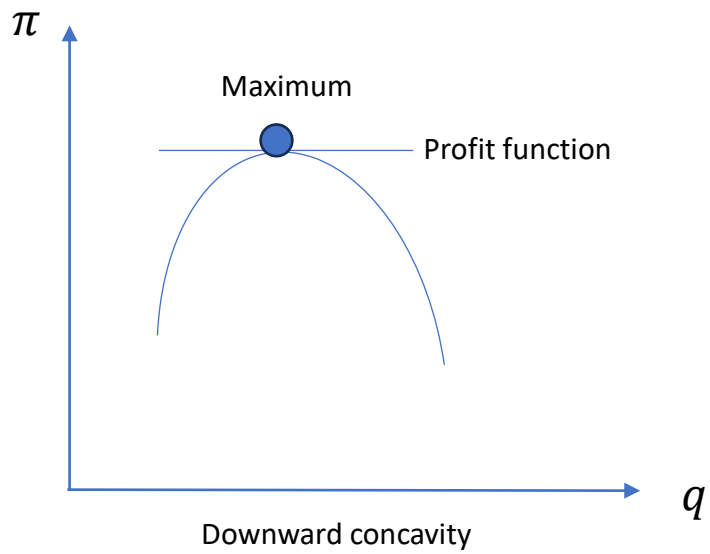

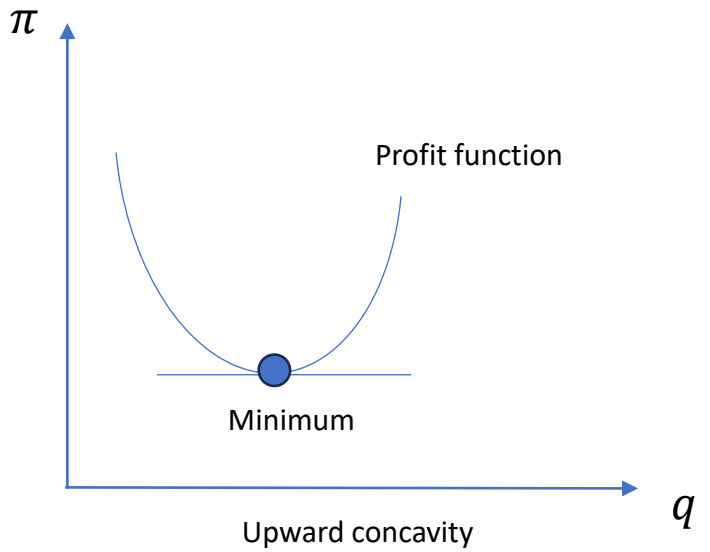

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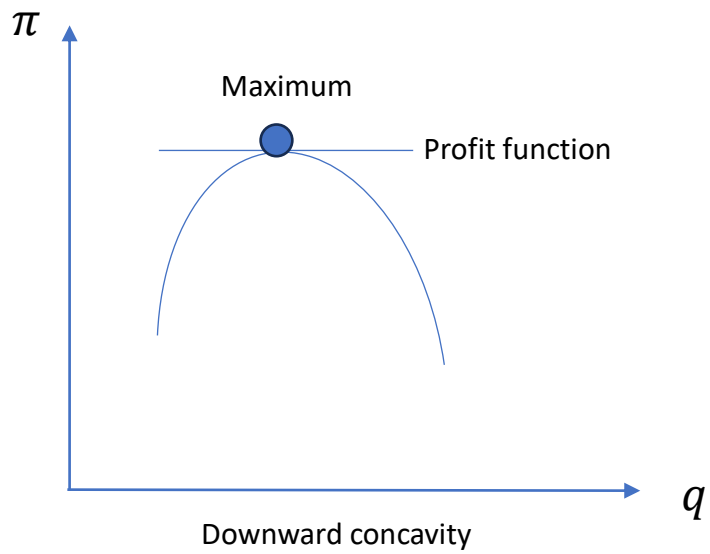

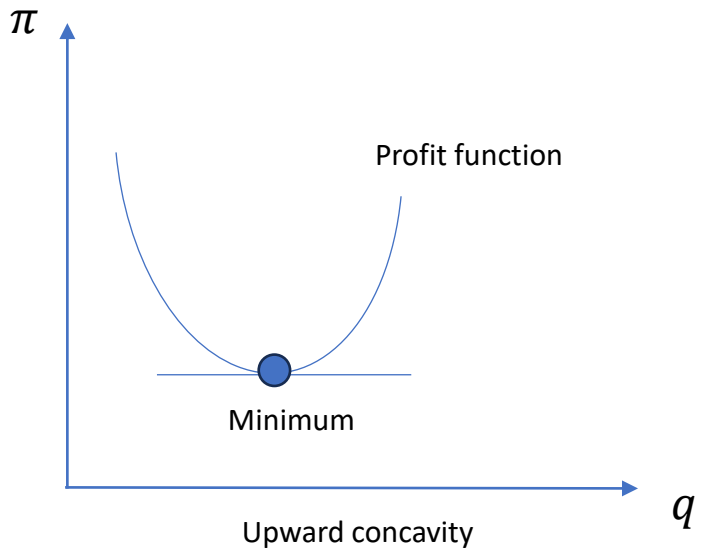

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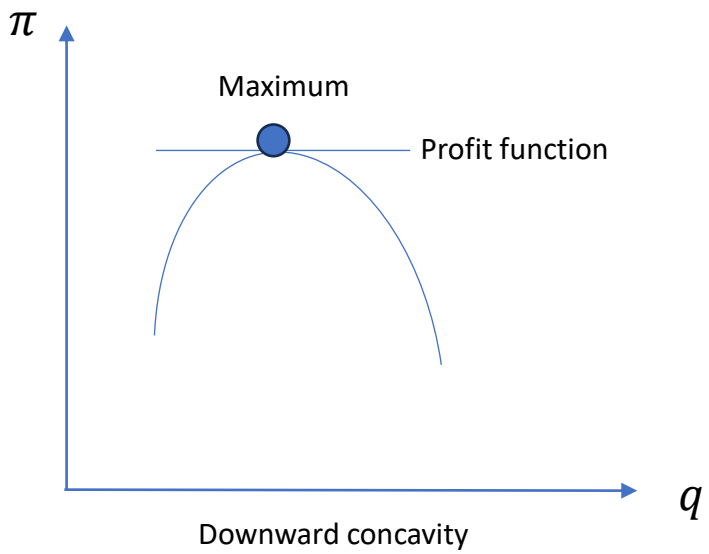
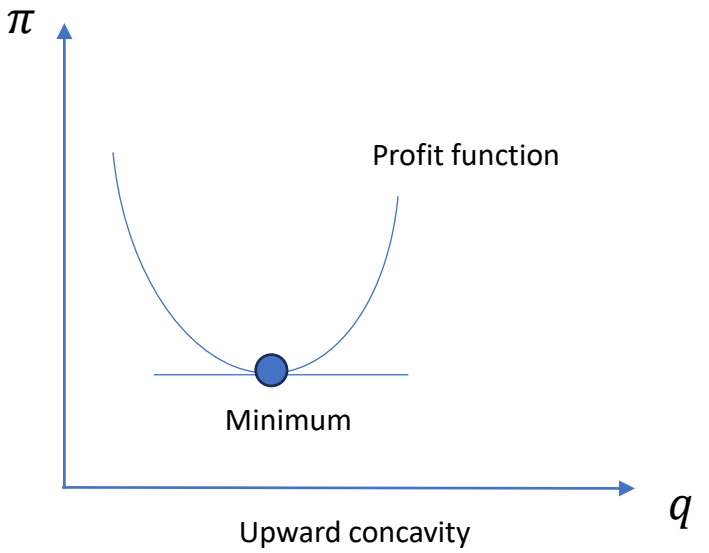
- If the second derivative of the function is positive at the desired point, we have upward concavity, and if it is negative, it is downward concavity.
- So, the second derivative of profit must be negative so that the profit function is maximized at P=MC.

$$\frac{d\pi}{dQ} = P - MC \quad \rightarrow \frac{d^2\pi}{dQ^2} = 0 - \frac{dMC}{dQ} < 0 \quad \rightarrow \quad \frac{dMC}{dQ} > 0$$





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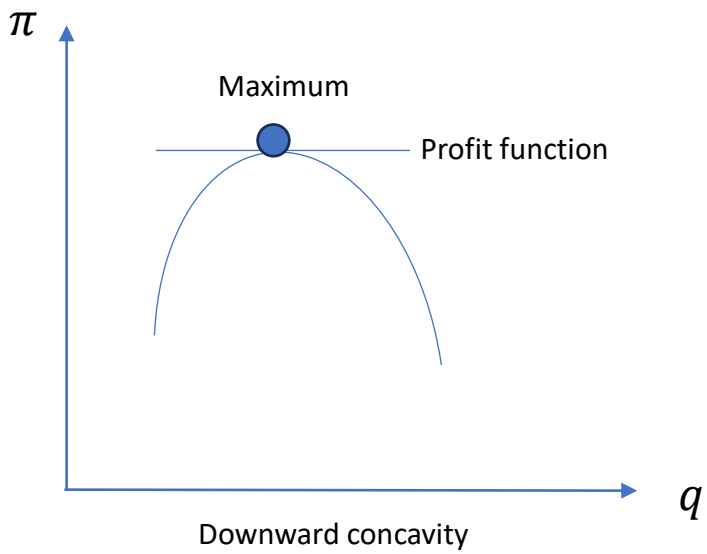

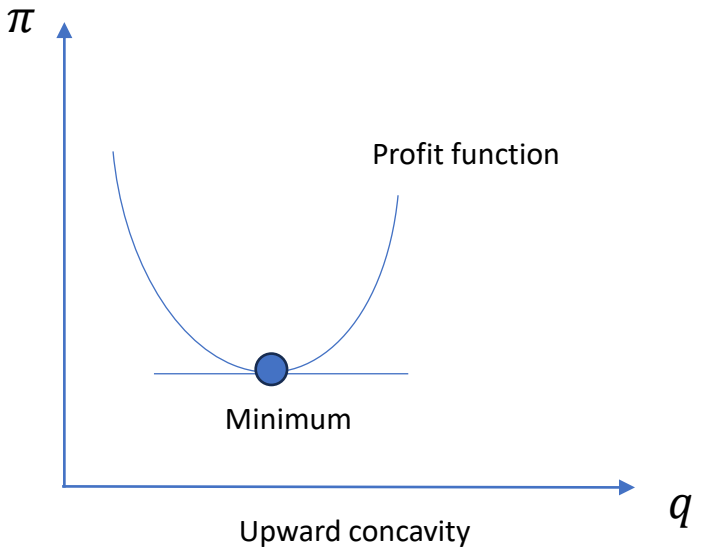

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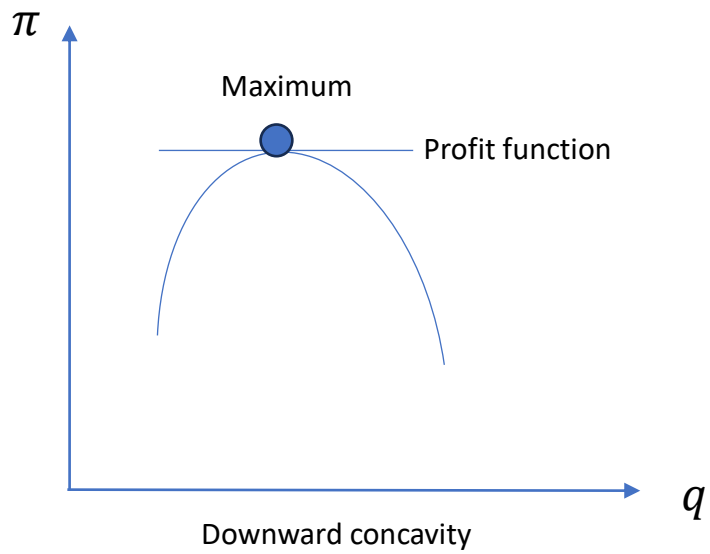

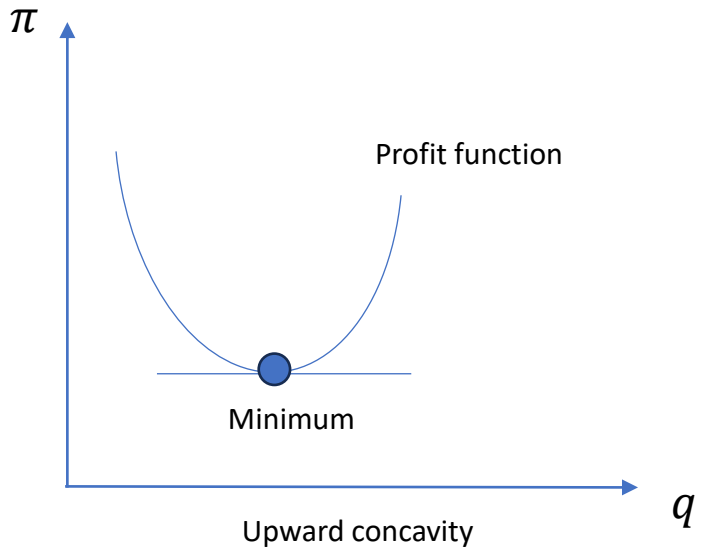

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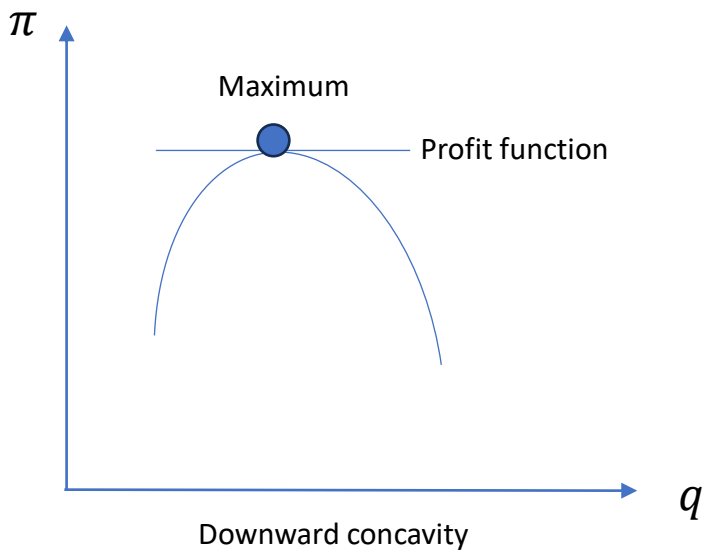
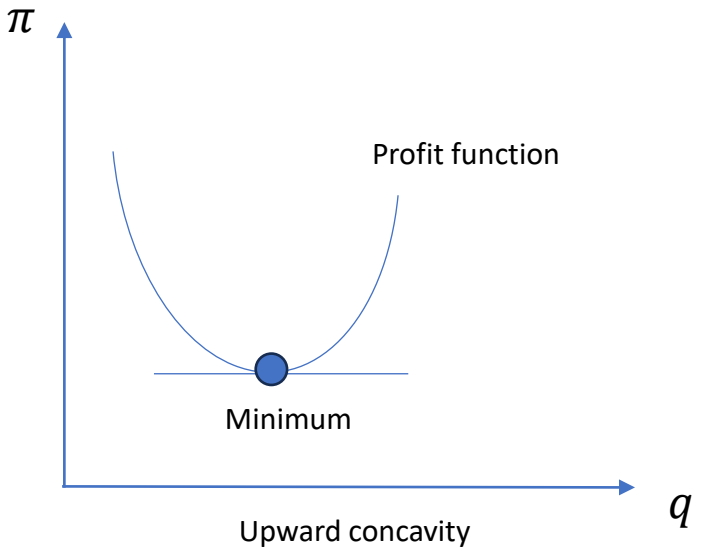
That is, the derivative of MC with respect to Q must be positive for MC to rise.





Markets, Perfect Competition

- A firm operates in a perfectly competitive market. If its total cost function is as follows and is at P=60, what is the optimal production that maximizes the company's profit?

$$TC = 100 + 69q - 14q^2 + q^3$$

Markets, Perfect Competition

❖ A firm operates in a perfectly competitive market. If its total cost function is as follows and is at P=60, what is the optimal production that maximizes the company's profit?

$$TC = 100 + 69q - 14q^2 + q^3$$

In a perfectly competitive market, the firm produces where P=MC.

$$MC = \frac{dTC}{dQ} = 69 - 28q + 3q^2$$

$$P = MC \qquad 60 = 69 - 28q + 3q^2$$

$$3q^2 - 28q + 9 = 0 \qquad (3q - 1)(q - 9) = 0 \qquad q = \frac{1}{3}, 9$$

$$\frac{dMC}{dQ} > 0 \qquad 6q - 28 > 0 \Rightarrow q > \frac{28}{6} \Rightarrow q > 4.6$$

Markets, Perfect Competition

The break-even point of the perfect competition firm:

- It is also the case that the market price is lower than the average variable cost
- In this case, the company's income cannot cover part of the variable cost of production in addition to its fixed cost. As a result, if they shut down the company, the variable cost is eliminated and the amount of loss is reduced.
- In this case, if the activity continues, the amount of loss will be more than the total fixed cost, while if it closes, it will lose to the amount of TFC, which means that the amount of loss will be less.
- If the market price becomes higher than the minimum average variable cost (min AVC), the company will start production again, and since MC always crosses the minimum AVC, the minimum AVC point is also called the closure point or the closure boundary of the company.
- According to the price situation, according to the AVC and AC curves, at the level of production P=MC, there are five states for the company.

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- In this case, if the activity continues, the amount of loss will be more than the total fixed cost, while if it closes, it will lose to the amount of TFC, which means that the amount of loss will be less.
- If the market price becomes higher than the minimum average variable cost (min AVC), the company will start production again, and since MC always crosses the minimum AVC, the minimum AVC point is also called the closure point or the closure boundary of the company.
- According to the price situation, according to the AVC and AC curves, at the level of production P=MC, there are five states for the company.

Markets, Perfect Competition

The break-even point of the perfect competition firm:

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Markets, Perfect Competition

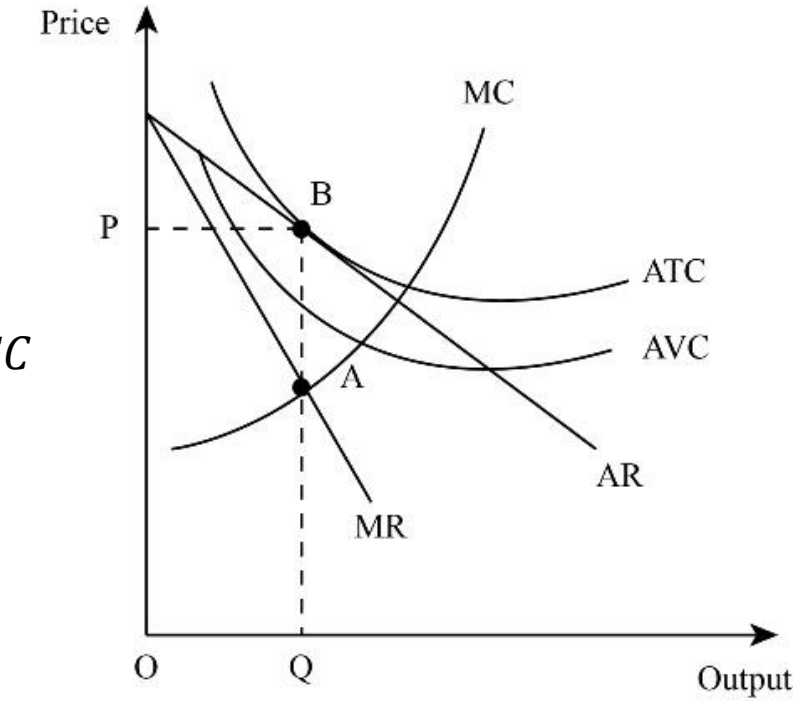
1) $P > AC \rightarrow TR > TC \rightarrow TR - TC > 0 \rightarrow \pi > 0$

2) $P = AC \rightarrow TR = TC \rightarrow TR - TC = 0 \rightarrow \pi = 0$

3) $AVC < P < AC \rightarrow TVC < TR < TC \rightarrow \pi < 0\ , \quad Loss < TFC$

4) $P = minAVC \rightarrow TR = TVC \rightarrow \pi < 0\ , \quad Loss = TFC$

5) $P < minAVC \rightarrow TR < TVC \rightarrow \pi < 0\ , \quad Loss > TFC$

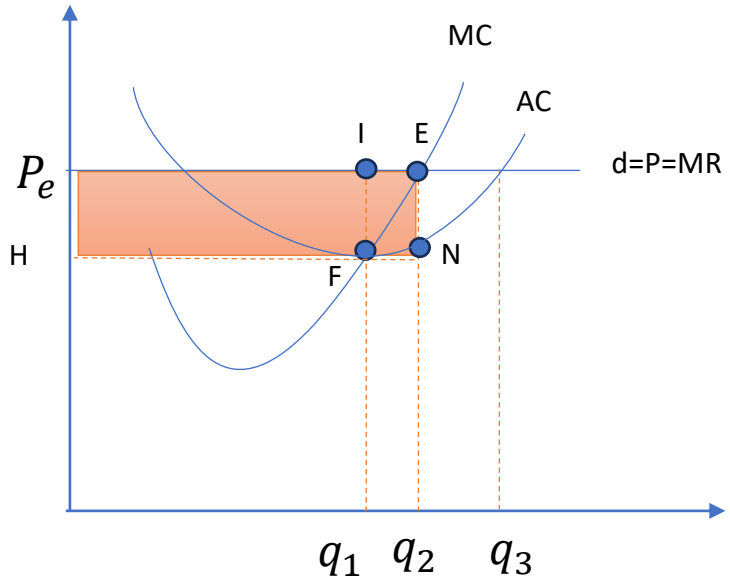


Markets, Perfect Competition

1) The price is higher than the minimum ATC.

In this case, $P>ATC \rightarrow TR>TC$ and the company earns profit and continues to produce

$$\pi = TR - TC = HP_eEN \qquad area$$



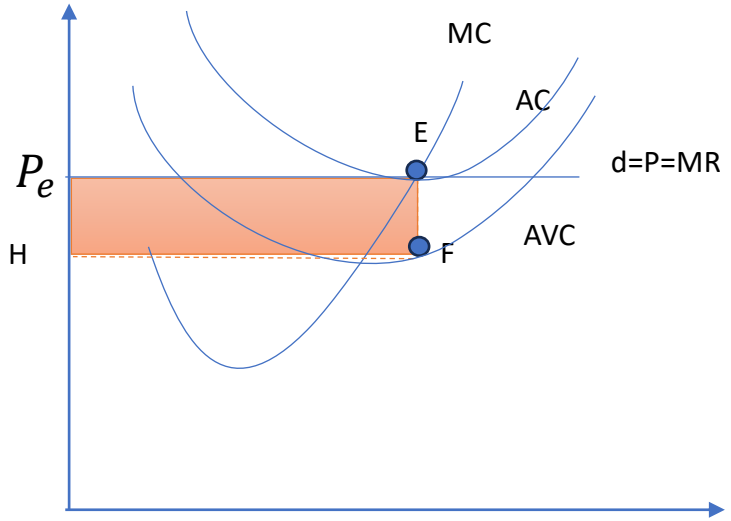
Markets, Perfect Competition

2) The price is equal to the minimum ATC.

In this case, the company does not make a profit because:

P=ATC → TR=TC → π=0, but the company continues to produce because if it shuts down, it **loses** as much as the fixed cost, while if it shuts down, the company's TR and TVC are zero, but the company's fixed cost remains, so the loss is equal with TFC.

$$TFC = HP_eEF \quad area$$



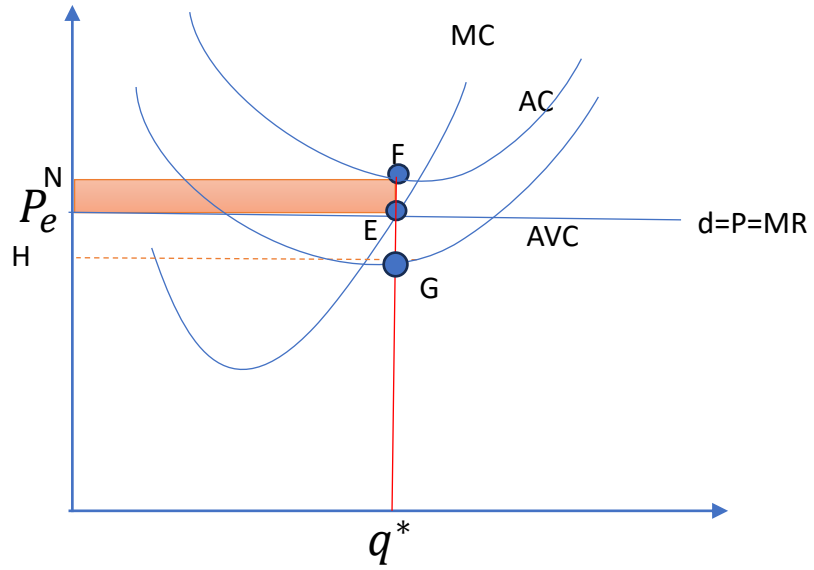
Markets, Perfect Competition

3) The price be lower than the minimum ATC and higher than the minimum AVC.

In this case, the company will lose if it shuts down and continues production, but if it continues to produce at the level of P=MC, the loss of the company will be less.
In this situation, the total loss of the company is equal to the minimum total loss, because if it does not continue production, the total income will be zero and the company will lose as much as TFC, which will be more than the total loss of the company if production continues.

$$Total\ loss = HP_eEF \quad area$$

TFC = $NHFG\ area$

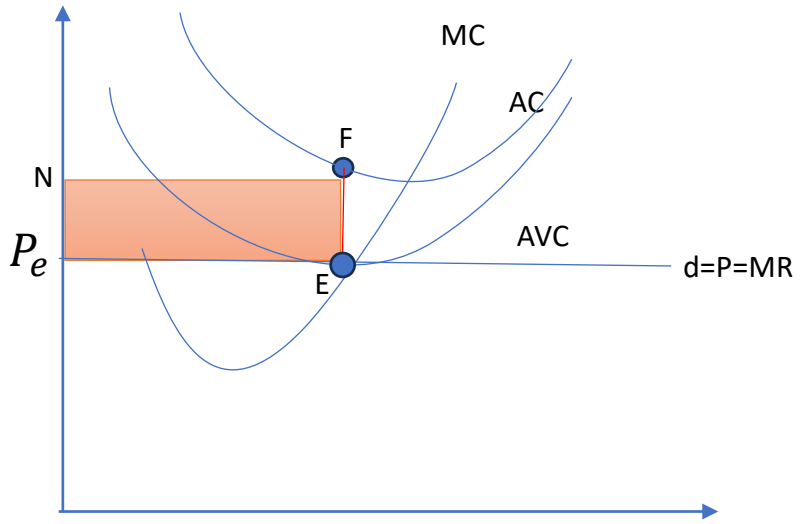


Markets, Perfect Competition

4) The price is equal to the minimum AVC.

In this case, the company loses, and the company's loss is equal to the company's TFC. Therefore, in case of continuing production and shutting down the company, it will lose equally. In this case, the firm is indifferent to production or shutdown

$$Total\ loss = P_e NEF \quad area$$

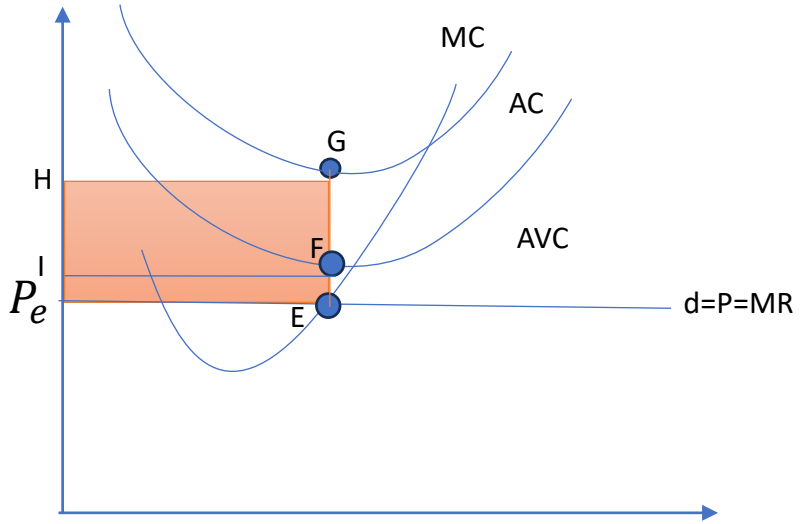


Markets, Perfect Competition

5) The price be lower than the minimum AVC.

In this case, the company loses and the company's loss is greater than TFC. Therefore, it is in the company's interest to close production in the short term. Therefore, if the price is lower than the minimum AVC, the firm will shut down, and if the price is higher than the minimum AVC, the firm will continue to produce even if it loses money. For this reason, the minimum AVC is called the point or boundary of the closure of a competitive firm

$$\Pi = TR - TC = P_e HGE$$
$$TFC = IHGF$$



Markets, Perfect Competition

The minimum AVC is the limit of closing and the minimum ATC is the limit of loss of the company.

Markets, Perfect Competition

The total cost function of a firm operating in a perfectly competitive industry is as follows. What is the minimum price that the company will continue to produce in the short term?

$$TC = 100 + 69q - 14q^2 + q^3$$