

## LM01 Firms and Market Structures

### Breakeven and shutdown points of production

Under perfect and imperfect competition:

Situation	Short Run	Long Run
Price > ATC	Economic Profit - Operate	Economic Profit - Operate
Price = ATC	Breakeven - Operate	Breakeven - Operate
AVC < Price < ATC	Operate	Shutdown
Price < AVC	Shutdown	Shutdown

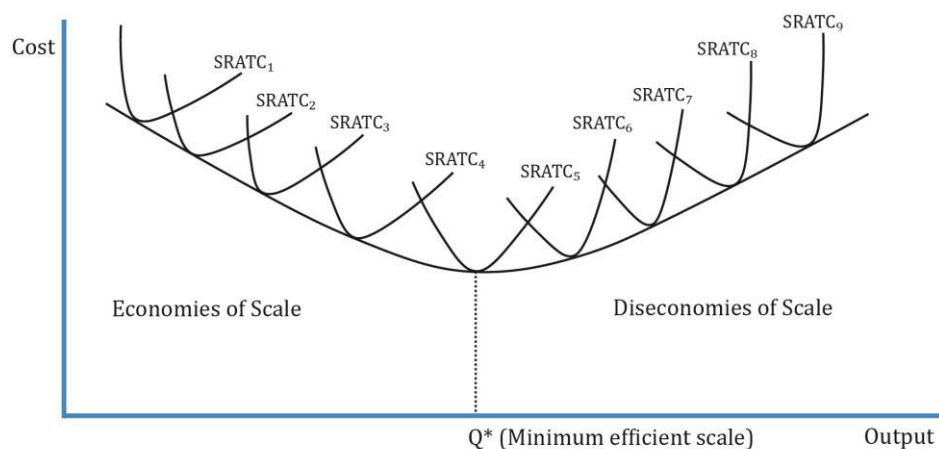
### Economies and diseconomies of scale

**Economies of scale:** As output increases, the long-run cost per unit decreases. Factors contributing to economies of scale include:

- Increase in output larger than increase in input
- Specialization
- More expensive but more efficient equipment
- Lower waste and lower costs
- Better use of market information
- Volume discounts from suppliers

**Diseconomies of scale:** As output increases, the long-run cost per unit increases. Factors contributing to diseconomies of scale include:

- Increases in output are less than increases in input
- Company size becomes too large to manage efficiently
- Duplication
- Higher labor costs
- Higher resource costs

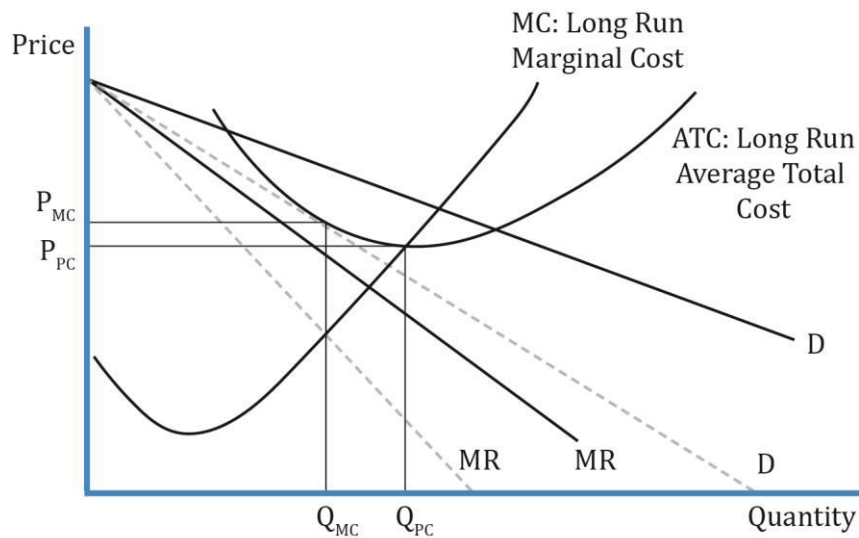


### Characteristics of perfect competition, monopolistic competition, oligopoly and pure monopoly

	<b>Perfect Competition</b>	<b>Monopolistic Competition</b>	<b>Oligopoly</b>	<b>Monopoly</b>
<b>Number of Sellers</b>	Many firms	Many firms	Few firms	Single firm
<b>Barriers to Entry and Exit</b>	Very low	Low	High	Very high
<b>Product Differentiation</b>	Homogeneous	Substitutes but differentiated	Close substitutes or differentiated	Unique product
<b>Non-price Competition</b>	None	Advertising and product differentiation	Advertising and product differentiation	Advertising
<b>Pricing Power</b>	None. Price taker.	Some	Some to significant	Considerable
<b>Example</b>	Oranges; Milk; Wheat	Toothpaste	Prices of commercial airlines for a given route	Electricity provider/any utility company (water, cooking gas) as they are typically controlled by a government authority

### Monopolistic competition

- Since the products are unique, a monopolistic firm has a downward sloping demand curve. MR is steeper and lies below the demand curve.
- Profit maximization output is based on  $MR = MC$ .
- Price is determined based on the demand curve.
- The supply function is not well-defined in monopolistic competition.



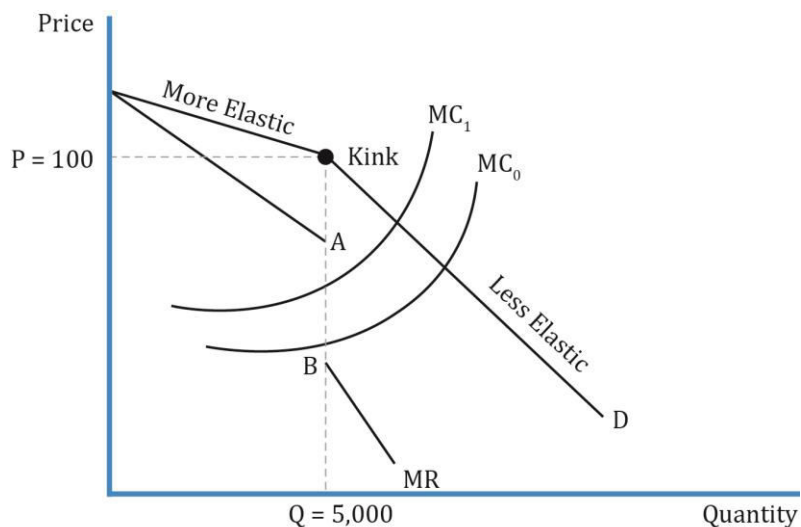
## Oligopoly

If firms do not collude, each firm faces an individual demand curve and a market demand curve. There are several models that try to explain pricing in oligopoly markets:

- Pricing interdependence – Kinked demand curve model
- Cournot assumption
- Nash equilibrium
- Stackelberg model

### Kinked demand curve model:

- Firms will not follow a price increase but will cut their prices in response to a price decrease by a competitor.
- The point of kink is the profit maximizing amount of production and price.
- Kink in the demand curve also creates a gap in the MR curve for the firm.



Cournot duopoly model:

- Each firm determines profit-maximizing quantity assuming other firms' output will not change.
- In the long-run, change in price or quantity will not increase profits.
- As the number of firms increases the equilibrium point moves towards perfect competition.

Nash equilibrium model:

- Each firm acts in its own best interest and does not collude.
- No firm can increase profits by changing its price/output choices.

Consider a two-firm oligopoly where both have agreed to charge a higher price.

	Firm Y respects	Firm Y cheats
Firm X respects	X earns 200 Y earns 200	X earns 50 Y earns 350
Firm X cheats	X earns 350 Y earns 50	X earns 150 Y earns 150

**Solution:**

Nash equilibrium is for both firms to charge a lower price i.e. cheat on their agreement. Either of the firm can improve their profits from 200 to 350 by cheating. However, the non-cheating firm can increase its profit from 50 to 150, giving both the firms an incentive to cheat.

Stackelberg dominant firm model:

- One firm is assumed to have the lowest cost structure and a significant proportion of the market.
- Dominant firm essentially sets the price for the industry.
- All other firms are price takers and set their output quantities according to this price.

The curriculum discusses the supply analysis for only one type of oligopoly – the dominant firm oligopoly.

- As in monopolistic competition, the supply function is not well defined.
- We cannot determine equilibrium output and price without considering the demand function and competitive strategies.
- Profit-maximizing condition:  $MR = MC$ .
- The equilibrium price is based on the demand curve

There is no single optimum price and output model that works for all oligopoly market situations because of different strategies and pricing methods. The process for determining the optimal price for a few methods is listed below:

- Kinked demand curve: Price at the kink in demand function.
- Dominant firm: Price at the quantity where  $MR = MC$ . Followers take the leader's

price.

- Cournot assumption: No changes in price and output by other firms once the dominant firm chooses its output level where  $MR=MC$ .
- Nash equilibrium: Each firm acts in its best interest under the given circumstances. No certainty of price and output level.

## Concentration measures

The two concentration ratios used to measure the market power of the firm are:

### N-Firm Concentration Ratio

- Sum of the market shares of the N largest firms in an industry
- Market share = firm revenue / total market revenue
- Advantage: Simple to calculate and understand
- Disadvantages: Ignores barriers to entry; does not directly measure market power or elasticity of demand

### Herfindahl-Hirschman Index (HHI)

- HHI = sum of squared market shares of N largest firms in a market.
- Ranges from 0 to 1: where 0 indicates perfect competition and 1 indicates a perfect monopoly.
- Advantage: Simple and commonly used by regulators.
- Disadvantage: Does not consider barriers to entry and elasticity of demand.

Consider the market share of the following firms:

Firm	Revenue/Total market revenue
Bruce	30%
Clark	20%
Flash	15%
Peter	10%
Xavier	10%
James	5%

Compute the following 4-firm concentration ratio and the HHI.

1. 4-firm concentration ratio prior to and post the merger of Bruce and Clark.
2. HHI prior to and post the merger of Bruce and Clark.

### Solution:

1. Prior to the merger:

Four – firm concentration ratio =  $30 + 20 + 15 + 10 = 75\%$

Post the merger, Bruce and Clark become one entity having a market share of 50%:

Four – firm concentration ratio =  $50 + 15 + 10 + 10 = 85\%$

Four-firm concentration ratio fails to capture the large increase in market share of the most

dominant firm which has gone up from 30% to 50%, while the measure has only gone up by 10%.

2. Prior to the merger:

$$\text{HHI} = 0.30^2 + 0.20^2 + 0.15^2 + 0.10^2 = 0.1625$$

Post the merger:

$$\text{HHI} = 0.50^2 + 0.15^2 + 0.10^2 + 0.10^2 = 0.2925$$

HHI shows a larger increase, better reflecting the increase in the market share of the new large firm.