

RAFFLES INSTITUTION YEAR 5 H2 ECONOMICS 2022

FIRMS AND DECISIONS (PART 2)

Firms' Decisions and Strategies

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Appendix 1: Mathematical Relationship Between TR, AR and MR

Appendix 2: Diagrammatic Analysis of the Price Leadership Model (Tacit Collusion)

Appendix 3: First and Second Degree Price Discrimination

Appendix 4: Case studies of Price Discrimination

Appendix 5: The Case of the Banking and Financial Sector

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Lecture Objectives:

At the end of the lecture series, candidates should be able to:

- explain the key features of each of the market structures
- explain how firms compete in the respective market structures based on their features
- understand the relevance of barriers to entry in explaining differences between market structures
- apply these models in analysing and comparing markets and evaluate their usefulness as explanations of real world competitive behaviour
- use the concept of profits to illustrate real world competitive decisions made by firms to protect their profits

FIRMS' DECISIONS AND STRATEGIES

1 INTRODUCTION

Firms sell goods and services under different market conditions, which economists call market structures. Firms output, pricing and non-pricing decisions and strategies are based not only on the objectives they seek to achieve but are also based on the market structures they are in. Understanding market structures is key to running a successful business. Business owners need to know the type of market structure they are engaged in in order to facilitate decision-making with regards to, for example, how much freedom they have to set prices, or how much attention to pay to the action of their rivals.

The market structure the firms are in also have an impact on the level of profits firms can make in the long run, the choices available to consumers and whether efficiency can be achieved in these markets. The concepts that we explore in this topic will help us to better understand the choices faced by firms, consumers and policy-makers and the eventual decisions they undertake.

The Four Characteristics Determining Market Structure

Market structures is a classification system for the key characteristics of a market. They are:

- i. Number of sellers/firms relative to market size
- ii. Extent of barriers to entry
- iii. Nature of product
- iv. Knowledge of product/market

Types of Market Structure

There are 4 types of market structure - **perfect competition**, **monopolistic competition**, **oligopoly** and **monopoly**. They vary according to the degree of competition in terms of the number and size of firms relative to the market.

At one end of the spectrum is perfect competition where there are many firms competing with one another and each firm is an insignificant part of the whole industry. At the other end is a monopoly, whereby there is only one firm in the market and there are no other competing firms. In between would be firms in monopolistic competition and oligopoly. Monopolistic competition, oligopoly and monopolies are imperfect market structures.

Market structures also differ in terms of the nature of product, the knowledge of product and extent of barriers to entry and exit.

2 PERFECT COMPETITION

Perfect competition is a market structure whereby there is a **large number of small firms relative to market size** and **its product is homogeneous**, **barriers to entry and exit are absent** and **information is perfect**.

The model of perfect competition is regarded as the 'ideal type' and is often used as a standard against which we judge the shortcomings of real-world industries. As such, it is built on assumptions that are very strict.

2.1 Characteristics of a Perfectly Competitive (PC) Market Structure

i. Large number of buyers and sellers

The exact number of firms cannot be stated. This condition is fulfilled when each firm in a market has no significant share of total market output due to the lack of entry barriers. Each firm hence acts independently in deciding its own output level, rather than coordinating decisions collectively. For example, there are thousands of independent egg farmers in the United States, each acting independently in deciding its output level.

ii. No barriers to entry and exit

As mentioned previously, the lack of entry barriers means that new firms face no restrictions when they enter the market. Financial, technical or government-imposed barriers such as licenses and patents are absent. Using the example of egg farmers in the US, start-up costs to raise hens are relatively low, resulting in the ease of entry and hence thousands of independent egg farmers in the US. By the same logic, there are also no restrictions on firms exiting the market.

This lack of entry & exit barriers accounts for the large number of firms with insignificant market share. It also accounts for why PC firms can only make normal profits in the long run.

iii. Homogeneous product

The product of the firm is identical to that of its rivals (in other words, they are perfect substitutes). For example, Farmer Brown's eggs are similar to Farmer Jones' eggs. Buyers will therefore not show preference for the product of any one farmer or firm. This characteristic rules out rivalry among firms in advertising and quality differences. Given that products are standardized, there is no variety in the PC market.

Given the insignificant market share and homogeneity of the product, each firm is unable to determine the price of its own product and has to sell it at the price that is determined by market demand and supply. In other words, each PC firm is a price-taker.

iv. Perfect knowledge

Every seller knows the prices and production costs of rivals, market costs, and the available production technology. Buyers also have complete information about each and every seller's price, the quality and availability of the products. Thus, buyers will not purchase from a PC firm that sells its good at a price higher than the prevailing market equilibrium price.

This characteristic contributes to the firm being a price-taker.

How the Characteristics Affect Pricing Decisions Under Perfect Competition (PC)

The perfectly competitive firm is a price-taker because of characteristics (i), (iii) and (iv). The PC firm has no control over the price of the product it sells but it has to follow the market price which is determined by the interaction between market demand and market supply.

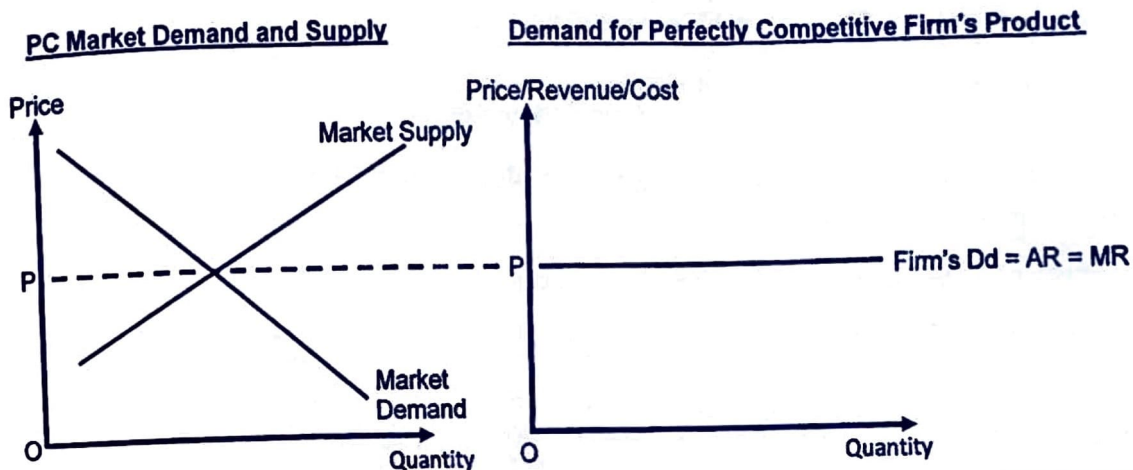
Think:
Can you think of real world examples of the PC market?

Recall factors
affecting market demand and supply under 'Price Mechanism and its Applications'.

As shown in Figure 1, the market equilibrium price OP is determined by the interaction between market demand and market supply. The PC firm has to sell its product at the prevailing market price OP because:

- If the PC firm were to sell its good above the market price OP , quantity demanded for that PC firm's product will fall to zero because consumers will simply purchase the product from any other firm since the products are perfect substitutes or identical.
- The individual PC firm has no incentive to reduce the price below the market equilibrium price OP because it can sell all it wants at the prevailing market price.

Figure 1



The market demand curve is the horizontal summation of the individual consumer's demand curve. It is illustrated by a downward sloping curve because a fall in market price will lead to an increase in quantity demanded for the good due to the substitution and income effects (*Recall: Law of Demand*).

The demand for the PC firm's output, on the other hand, is perfectly price-elastic because the PC firm is a price-taker. Hence, the PC firm's demand curve is illustrated by a horizontal straight line which means that every unit of output will be sold at the market price, OP .

For the PC firm, its Price (P) = Average revenue (AR) = Marginal revenue (MR). To understand why, we need to understand the different types of revenue concepts:

- **Revenue concepts**

- Total revenue (TR) refers to the total receipts of a firm generated from selling goods and services in a market.

$$\text{TR} = \text{Price (P)} \times \text{Quantity sold (Q)} = P \times Q$$

- Average Revenue (AR) refers to the revenue per unit of output sold.

Assume a uniform price is charged regardless of output sold,

$$\text{AR} = \text{TR}/Q = [P \times Q]/Q = P$$

Note:
The horizontal demand curve facing the PC firm is reflective of price taking behavior. Firms with price setting ability in the other market structures will face a downward sloping demand curve.

- **Marginal Revenue (MR)** refers to the increase in revenue resulting from selling an additional unit of output

$$\bullet \text{ MR} = \Delta \text{TR} / \Delta Q$$

- **Given that a single price is charged for each and every unit sold by the firm, the firm's average revenue is equal to its price.** Since the demand curve reflects the maximum price consumers are willing and able to pay for each unit of the good, the demand curve for the firm's output is also its average revenue (AR) curve.
- **The PC firm's marginal revenue (MR) remains constant and is equal to AR regardless of the output level** because the sale of each and every additional unit of output adds exactly the same amount to total revenue. For example, if an extra unit is sold at a constant price of \$5, an extra \$5 will be earned.
- *The mathematical relationship between price, average revenue, marginal revenue and total revenue is explored in greater detail in Appendix 1.*

As we shall see later, the $P=AR=MR$ property will have some implications on the performance of PC firms.

How the Characteristics Affect Output Decisions Under Perfect Competition (PC)

Profit Maximising Equilibrium (Marginalist Approach)

Profit refers to the difference between total revenue (TR) and total opportunity costs (TC). Profit plays a significant role in businesses because profit is the financial return or reward for undertaking risk in the business. Profits are also important because banks, suppliers and other lenders are more likely to provide finance to a firm that demonstrates the ability to make profits. The ability to make profits also ensures the survival of firms in an industry in the long run. In addition, retained profit is an important source of finance for a business. Retained profits are profits that are earned but are not distributed to the owners via dividends or other payments. Instead they are reinvested and can be used to finance R&D and expansion of the firm.

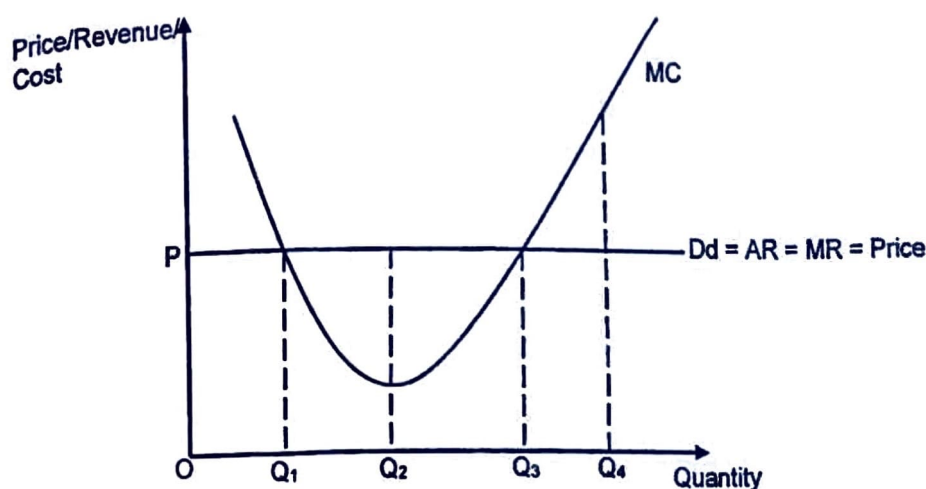
The traditional theory of the firm assumes that firms aim to **maximize total profits** (that is, maximize the difference between total revenue (TR) and total opportunity costs (TC)). By achieving its aim, the firm is said to be in equilibrium, in other words, the firm has no tendency to change its price and output decision.

Important: Firms are assumed to be profit-maximisers unless otherwise inferred.

Although the PC firm cannot determine its own price but has to accept the market price as given, the PC firm can determine its output level. The PC firm is in equilibrium if it is producing the level of output that maximises total profit. In order to maximize total profits, the rational PC firm has to make output decisions **at the margin** by weighing its marginal costs (MC) against its marginal revenue (MR). The PC firm is in equilibrium only when the following two conditions are met:

- MR = MC and**
- MC must be rising.**

Figure 2: Perfectly Competitive Firm



This is a revision of the marginalist principle that was explained in Firms and Decisions (Part 1).

i. $MR = MC$

- Recall that $MC = \Delta TC / \Delta Q$
- Recall that $MR = \Delta TR / \Delta Q$
- In order to maximise its total profits, a firm should produce the output level where the addition to total revenue from the sale of the last unit of output equals to the addition to total cost in producing it. In other words, marginal revenue is equal to marginal cost. As shown in Figure 2, the profit-maximising output level is at OQ_3 . The firm should change its output level whenever marginal revenue is not equal to marginal cost because:
 - At output OQ_2 , MR is greater than MC . The addition to total revenue from the last unit of output is greater than the additional cost incurred in producing it. The firm can increase its profits if it increases production beyond OQ_2 .
 - However, at output OQ_4 , MC is greater than MR . It costs more to produce that last unit than what the firm gains in revenue. Producing this last unit causes a fall in total profits. Hence, the firm should reduce its output.
 - Hence, profit is only maximised when the last unit of output produced adds as much to total revenue as it does to total cost. And that profit-maximising level of output is at OQ_3 .

ii. MC must also be rising. This is because:

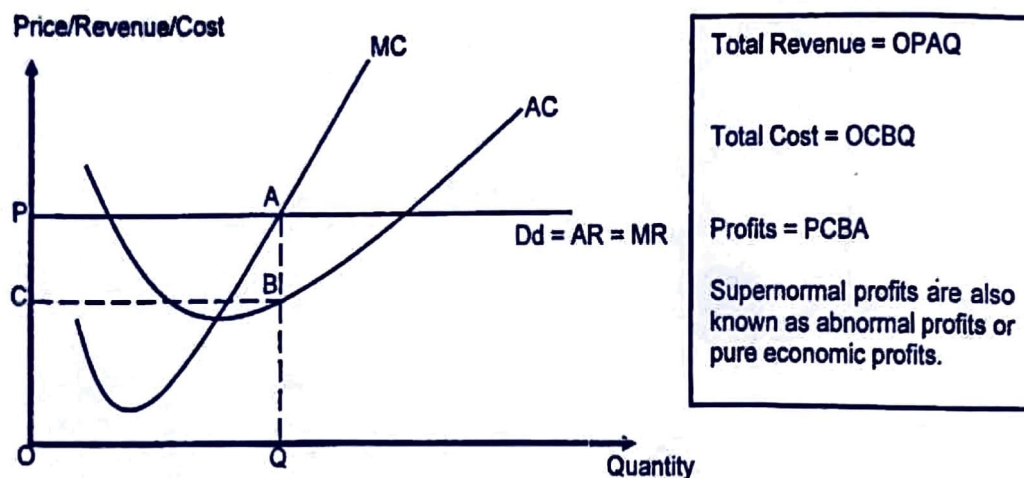
- At OQ_1 , $MR = MC$ but MC is falling. Why doesn't the firm stop here? This is because additional output produced (Q_1Q_3) will add more to total revenue than to total cost. Hence, the firm should still increase its output in order to maximize its total profits.

2.2 Short Run Equilibrium and Shut-Down Condition

In the short run, at its profit-maximising output level, the perfectly competitive firm can be making supernormal, normal or subnormal profits.

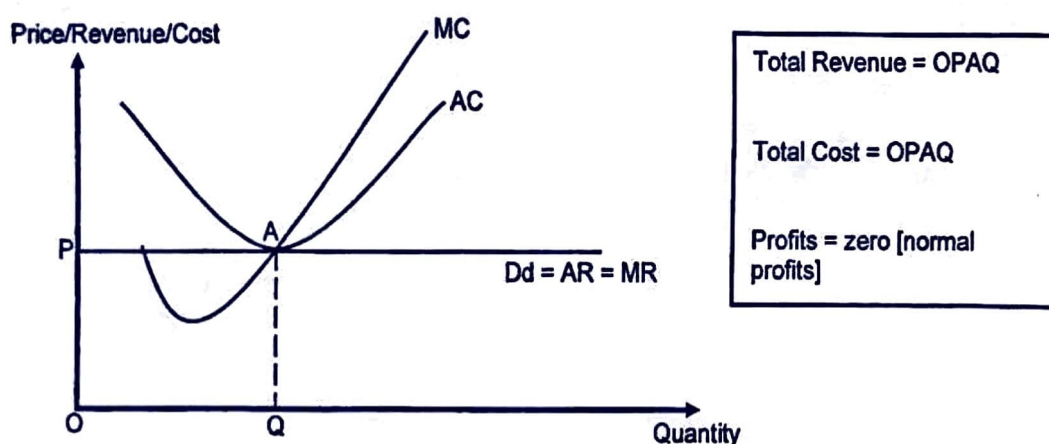
The scenarios and diagrams below illustrate the revenue and cost curves of the PC firm under different conditions. The firm's profit-maximising output level is at OQ where MC and MR and MC is rising.

Figure 3a: Equilibrium with Supernormal Profits ($TR > TC$ or $AR > AC$)



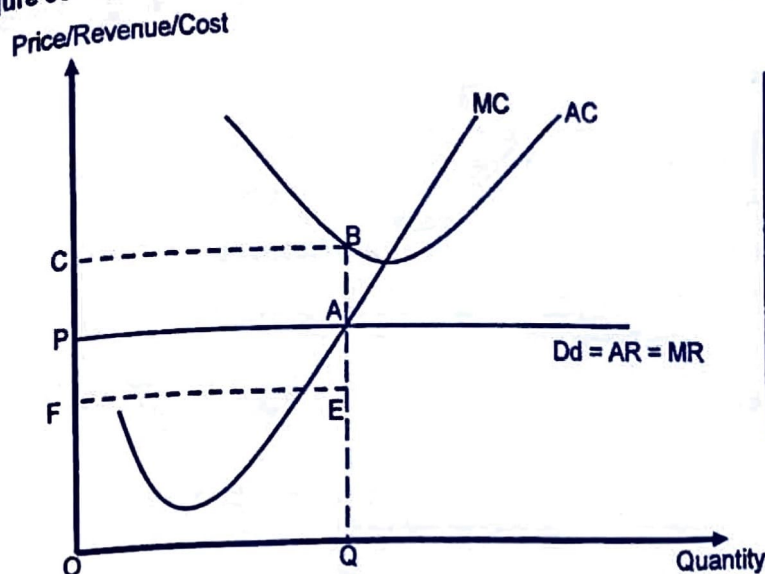
- The PC firm in figure 3a is making short run supernormal profits. Supernormal profit is the excess of total profit above normal profit. Hence there is incentive for new firms to enter the market in the long run.

Figure 3b: Equilibrium with Normal Profits ($TR = TC$ or $AR = AC$)



- The PC firm in figure 3b is making normal profits. Normal profit is the minimum profit required to keep factors of production in their current use in the long run. The firm's total revenue adequately compensates the owners for the time and other resources they expend to keep the business going.

Figure 3c: Equilibrium with subnormal profits ($TR < TC$ or $AR < AC$)



Total Revenue = OPAQ

Total Cost = OCBQ

Loss = PCBA

(Loss to the firm is also known as subnormal profits)

- The profit-maximising PC firm in figure 3c is making subnormal profits.

Short Run Shut Down Condition:

When a firm incurs losses, we might wonder why the firm may choose not to shut down to avoid losses instead of continuing production. In the short run, the firm can only reduce the variable costs to zero by stopping production and shutting down. However, it will not be able to avoid the losses incurred from paying for the fixed factors of production even if it produces a quantity of zero. Therefore, in the short run, the firm making subnormal profits must decide whether to continue production or to shut down and produce zero output temporarily to minimize its losses.

Key Concept:
It is important to know the shut-down condition of firms. Firm should shut-down in the SR when:
- $TR < TVC$
- $AR < AVC$

In the short run, there is at least one fixed factor of production, hence the firm making subnormal profits cannot leave the industry but it can adjust its output level to make the best of the situation and minimize its losses.

In deciding whether to continue production or to shut down in the short run, the firm only needs to consider whether its total revenue can cover its variable costs. It should produce if the revenue earned is more than its variable costs as the surplus generated can be used to offset part of its fixed costs. If the revenue earned is less than the variable costs, the firm should shut down so that its losses are limited to only the fixed costs instead of making losses on both fixed and variable costs. The firm does not have to consider its fixed costs because fixed costs have to be incurred regardless of whether the firm continues production or shuts down and produce nothing in the short run. For instance, the firm has to pay rental costs for its factory in the short run even if it stops production temporarily in the short run.

However, a firm will consider shutting down production when the revenue received from the sales of goods and services produced cannot cover the variable cost of production. In this situation, a firm will lose more money when it produces goods and services than if it does not produce at all. Similarly, if the firm were to produce a lower output, it would continue to add to the losses because it would still need to acquire variable factors of production to produce the goods and services that are not covered by the revenue in addition to the fixed costs. Hence, by ceasing production, the firm would minimize its losses by only incurring the fixed costs.

In the long-run, the firm should only continue producing if it can cover all costs. All factors

of production are variable in the long-run so firms do not incur fixed costs. Therefore, firms should continue production as long it can cover its cost of production.

- **Example of Short Run Shut Down Condition**

For example, assume a firm called Miss Coconut, sells coconut shakes at Raffles Institution. It has signed a contract to rent a stall at the Year 5-6 canteen for \$2,000 per month and hires staff for \$5,000. If Miss Coconut decides to operate, its variable costs for hiring staff every month is \$5,000. However, if Miss Coconut decides to shut down, it must still pay the rent of \$2,000 for the stall to Raffles Institution but would not need to hire staff to mend the stalls since there will be no production of coconut shakes.

Now, let us look at three possible scenarios.

- In the first scenario, if Miss Coconut does not make any sales and therefore does not make any revenues, it faces a loss of \$7,000.
- In the second scenario, if Miss Coconut manages to sell a certain number of coconut shakes and earn a revenue of \$2,000 for the month, but ultimately experiences a loss of \$5,000.
- In the third scenario, if Miss Coconut earns revenues of \$6,000 for the month, but experiences a loss of \$1,000.

In all three cases, Miss Coconut earns subnormal profits. In all three cases, when the rental contract expires and the total revenue does not improve in the long run, Miss Coconut should exit the coconut shake business. However, in the short run, Miss Coconut needs to decide whether to shut down to minimize losses or continue production depending on the level of losses.

- In scenario 1, Miss Coconut earns zero total revenue, so employing staffs would increase total variable costs. As such, the firm **should shut down** to minimize losses and only incur total fixed costs of \$2,000 [rental].
- In scenario 2, Miss Coconut's losses are greater because it does not make enough revenue to offset the total variable costs [from hiring labour] plus total fixed costs. Hence, it should **shut down immediately to minimize its losses**. Instead of making a loss of \$5,000, it will make a loss of \$2,000 by shutting down. Thus, if the price of each cup of coconut shake is below the minimum average variable cost, then Miss Coconut must shut down.
- In scenario 3, the revenue that Miss Coconut can earn is high enough for the losses to be minimised when it continues production. The **revenue earned is enough to cover the variable costs and part of the fixed costs**. Hence, by continuing production, it will only incur a loss of \$1,000 which is lower than shutting down [incurring a loss of \$2,000 = fixed costs]. As such, Miss Coconut should continue operating in the Raffles Institution Year 5-6 canteen in the short run.

Should Miss Coconut Shut Down Now or Later?

Scenario 1:

If Miss Coconut shuts down now, total revenue is zero but it will not incur any variable costs and would only need to pay fixed costs of \$2,000.

$$\text{Profit} = \text{Total Revenue} - (\text{Total Fixed Costs} + \text{Total Variable Costs})$$
$$\text{Profit} = \$0 - \$7,000 = -\$7,000$$

Scenario 2:

Miss Coconut earns a total revenue of \$2,000, and its total variable costs are \$5,000.
Miss Coconut should shut down now.

$$\text{Profit} = \text{Total Revenue} - (\text{Total Fixed Costs} + \text{Total Variable Costs})$$

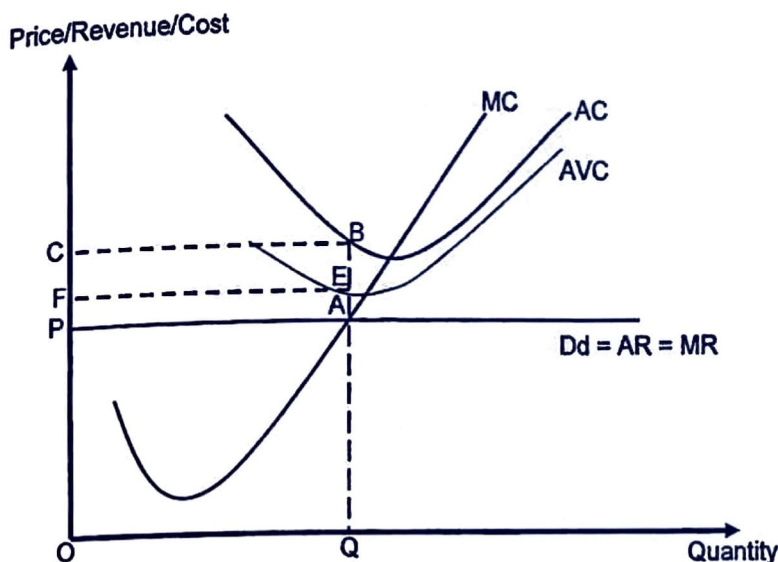
$$\text{Profit} = \$2,000 - (\$2,000 + \$5,000) = -\$5,000$$

Based on scenarios 1&2, the firm earning subnormal profits in the short run will shut down and stop production temporarily only if its TR falls below its TVC ($TR < TVC$). This is because the firm will minimize its loss if it shuts down and stops production temporarily rather than if it continues production. If it shuts down and stops production temporarily, the firm's loss will be equal to its total fixed costs. If it continues production, assuming that $TR < TVC$, the firm's TR will not be able to cover part of its total variable costs and all of its total fixed costs. Hence, the firm will minimize its loss by shutting down production if $TR < TVC$.

From figure 3c, if Miss Coconut continues production, the firm's TR will not be able to cover part of its total variable costs (FEAP) and all of its total fixed costs.

Figure 3c: Short-run shutdown ($TR < TVC$ or $AR < AVC$)

Note:
Diagrammatic analysis of the shutdown condition is not required.



Scenario 3:

Miss Coconut earns a total revenue of \$6,000, and its total variable costs are \$5,000.
Miss Coconut should continue operating its stall in the canteen.

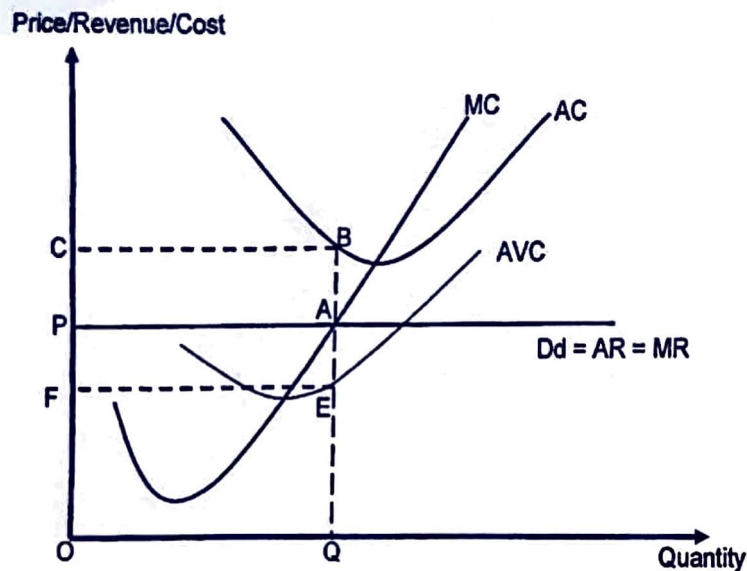
$$\text{Profit} = \text{Total Revenue} - (\text{Total Fixed Costs} + \text{Total Variable Costs})$$

$$\text{Profit} = \$6,000 - (\$2,000 + \$5,000) = -\$1,000$$

From the illustration above, a firm earning subnormal profits will continue production only if its TR is at least equal to or exceeds its TVC ($TR =$ or $> TVC$) in the short run. This is because the firm will minimize its loss if it continues production rather than if it stops production temporarily. If it shuts down and stops production temporarily, the firm's loss will be equal to its total fixed costs (TFC). If it continues production, assuming that $TR > TVC$, the firm's TR will be able to cover its total variable costs and part of its total fixed costs. Hence, the firm will minimize its loss by continuing production if $TR > TVC$.

As shown in figure 3d, if Miss Coconut shuts down and stops production temporarily, the firm's loss will be equal to its total fixed costs (TFC) which is area CBEF. If it continues production, assuming that $TR > TVC$, the firm's TR (area OPAQ) will be able to cover its total variable costs (area OFEQ) and part of its total fixed costs (area PAEF).

Figure 3d: Equilibrium with subnormal profits (Continue Production)



- Implications of a Shut Down in the Short Run

The decision to shut down production is usually temporary and does not necessarily imply that a firm will go out of business, exiting the industry. For example, several firms in industries that are affected by seasonal changes such as fishing, agriculture, are likely to shut down their operations during the offseason to avoid incurring unnecessary operating costs to minimize their losses. This is because these firms are unlikely to generate any revenue during the offseason. As such, they are unable to cover the variable costs of production such as fertilisers and labours. Therefore, firms operating in these industries will temporarily shut down until the upcoming season.

Similarly, if the market conditions improve because of rising prices or declining cost conditions, the firm can resume production. A firm's decision to cease production is a short run decision. If a firm chooses to shut down, it will still retain its capital assets but will not leave the industry or avoid paying for its fixed factors of production.

However, a firm cannot incur losses indefinitely as it affects its long run decisions. If a firm shuts down for an extended period, it has to decide whether to continue the business or leave the industry in the long run. The decision to exit is taken over a period of time. A firm that exits an industry does not earn any revenue, but is also does not incur fixed or variable costs.

2.3 Long Run Equilibrium and Shut-Down Condition

The PC firm can only make a maximum of normal profits in the long run because there are no barriers to entry or exit, hence any firm that sees there are supernormal profits to be gained in the industry has the ability to enter and compete in that industry. Similarly, any firm that is facing subnormal profits will be able to leave the industry in the long run.

Adjustment from Short Run Supernormal Profits to Long Run Normal Profits:

Figure 4a illustrates the market demand and supply curves in a PC market. Figure 4b illustrates the revenue and cost curves of a typical firm in the PC market and the firm is assumed to be initially maximizing its short run supernormal profits of P_1ABC at output OQ_1 where MC equals MR_1 and MC is rising.

Note:
Diagrammatic illustration of firms' short-run to long-run equilibrium adjustment is not required.

The presence of supernormal profits attracts new firms to enter the market. The increase in the number of firms leads to an increase in the quantity supplied at every price in the market. Thus, the market supply curve increases (and this is illustrated by the market supply curve shifting to the right) which leads to a surplus at the original market price OP_1 . The surplus then causes the equilibrium market price to fall. As PC firms are price-takers, they now have to sell at the lower price. As price falls, the supernormal profits of firms get eroded.

Eventually when the market supply curve has shifted to S_2 , with a resultant fall in market equilibrium price to P_2 , the supernormal profits of all firms in the PC market would have been completely eroded. The firms which are still in the PC market would be making only normal profits ($AR_2=AC$) at their new and lower profit-maximising output OQ_2 where MC equals MR_2 and MC is rising. Therefore, in the long run, the firm in perfect competition makes only normal profits. (Note that while the market supply has risen to Q_{m2} , each individual PC firm would have reduced its respective output from Q_1 to Q_2 .)

Figure 4a: PC Market

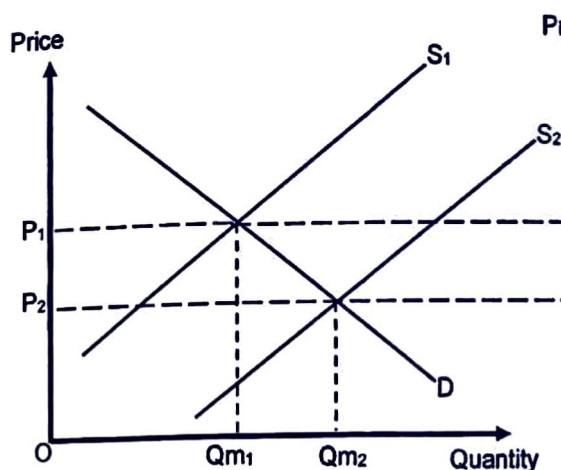
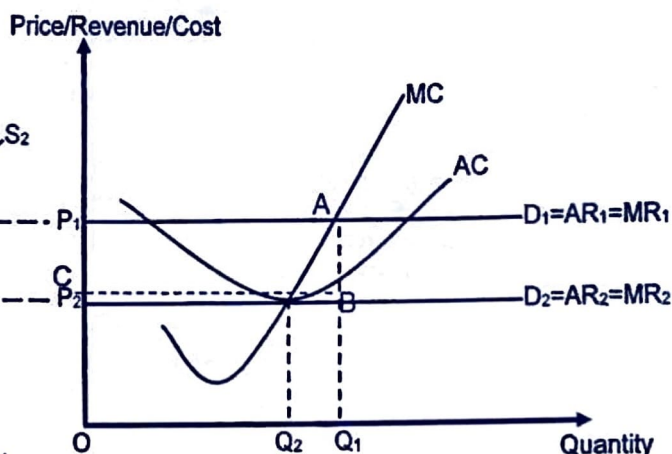


Figure 4b: PC Firm



Adjustment from Short Run Subnormal Profits to Long Run Normal Profits:

When firms in the PC market make short run subnormal profits and they expect the subnormal profits to persist, they will decide to shut down and leave the market in the long run. This is because the long run time frame is a planning period when all factors of production are variable.

The lack of exit barriers facilitates the exit of these PC firms which causes the number of firms in the market to be reduced which in turn leads to a fall in the quantity supplied of output in the market at every price level and hence, the market supply falls. The fall in market supply causes a rise in price. Assuming no change in cost conditions, the higher price results in the losses of those PC firms who survived in the market being reduced. Eventually at a new higher market equilibrium price in the long run, the surviving PC firms will only be making normal profits, that is $TR=TC$ or $AR=AC$.

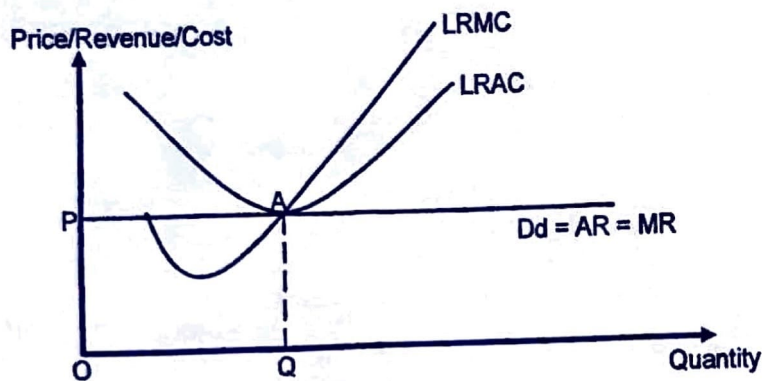
Key concept:
The long-run shut down condition is $TR < TC$ or $AR < AC$ at the profit maximizing output level.

Long Run Equilibrium of PC Firm

In the long run, profit-maximising PC firm can only make normal profits due to absence of entry barriers. The PC firm making normal profit in the long run is indifferent between staying in the market or leaving the market in the long run.

Based on the characteristics of the PC market structure, PC firms are price takers that do not engage in price or non-price competitive strategies.

Figure 4c: Long Run Equilibrium



Sectional Summary:

- The 4 characteristics of perfect competition are a large number of firms, complete freedom of entry and exit, a homogeneous product and perfect knowledge. These 4 characteristics affect the price and output decisions of PC firms as well as their lack of marketing strategies and their performance in the market. No real-world market exactly fits the 4 assumptions or characteristics of perfect competition but some markets such as the farm product markets e.g. Eggs approximate the PC model.
- The PC firm is a price taker and has to sell its output at the market equilibrium price. Although it cannot set its price, the PC firm can adjust its output level. The profit-maximising PC firm can use the marginalist approach to set its output level which is achieved when $MR = MC$ and MC is rising.
- The PC firm can make supernormal, normal and subnormal profits (as long as $TR > TVC$) in the short run (applies to all market structures).
- The PC firm can only make normal profits in the long run because of absence of entry and exit barriers.
- Short run and Long-run shut-down conditions are given below:

Table 1

Should the firm making subnormal profits ($TR < TC$) shut down? (Applies to firms in all market structures)				
Short run (at least one factor input is fixed)				Long run (all factor inputs are variable)
$TR > TVC$		$TR < TVC$		Yes
No, the firm will minimize its loss by continuing production.		Yes, the firm will minimize its loss by shutting down and producing zero output.		Yes, the firm will minimize its loss by shutting down and leaving the industry.
If continue production	If stop production	If continue production	If stop production	-
TR covers all TVC and part of TFC, Loss = part of TFC	Loss = TFC	TR covers only part of TVC, Loss = part of TVC + TFC	Loss = TFC	-

Note: Students are expected to be able to explain and/or illustrate each of the above statements using relevant examples. Diagrammatic illustration is a useful tool but not required to score full credit if explanation is sound.

3 MONOPOLY

3.1 Characteristics of a Monopoly

A monopoly is a market structure whereby the firm is the only seller of a good or service that has no close substitutes. Its barriers to entry and exit are complete and information is imperfect.

i. Single producer

A firm is a perfect monopoly or a pure monopoly if it controls 100% of the market in a product (*strict definition*).

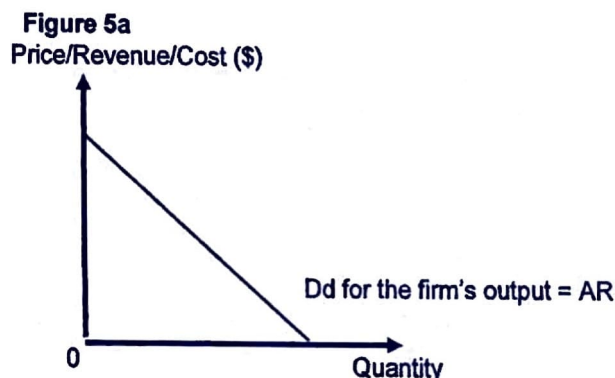
In reality, a firm is considered a monopoly when it controls slightly less than 100% of the market but is the only dominant firm in the market (*broader definition*). For instance, throughout the twentieth century, in the market for diamonds, De Beers was considered a monopoly because it controlled 80 to 90 percent of the diamond market.

Since the monopoly faces no competition at all, the monopoly is able to exert control over how much it charges for its product, in other words, the monopoly is a **price setter** and it can decide whether it wants to charge a high price or a low price for its product. For example, De Beers wielded so much monopoly power that it was almost totally able to exert control over diamond prices.

Key concept:
Market power or monopoly power refers to the ability of firms to set prices.

Although a monopoly like De Beers can choose to sell at any price it wants without fear of being undercut, it is still constrained by its market demand. This means that if it wishes to sell a larger quantity, it must lower its price. If it wants to sell at a higher price, then the output must be reduced. In other words, it cannot increase both price and output at the same time.

Figure 5a illustrates the demand curve for the monopolist's output which is also the market demand curve because the single firm supplies to the entire market. The demand curve for the monopolist's output is downward sloping because of substitution and income effects.



Whether a firm can be considered a monopoly is not always clear. To some extent, the boundaries of a market are arbitrary. It depends on how narrowly the market is defined. For e.g., could SMRT be considered a monopoly for train services?

ii. Complete barriers to entry and exit

In a monopoly, new firms **cannot enter** the industry even when there are supernormal profits to be earned because of the presence of complete barriers to entry erected by the incumbent monopoly. Barriers to entry and exit include:

- **Artificial barriers to entry – include statutory barriers and strategic barriers.**

- **Strategic barriers (strategic entry deterrence)**

- **Strategic entry deterrence involves any move by the incumbent firm to keep potential firms out of the market. Examples include intensive advertising to product differentiate, R&D, limit pricing and hostile takeovers and acquisitions.**
- **For instance, a monopoly can employ intensive advertising to raise awareness which can help to boost demand for its product as well as to persuade customers that there are no close substitutes for its product. This serves to induce customer loyalty and makes it more difficult for potential entrants to break into the market. For instance, De Beers created these four iconic words "A Diamond Is Forever" that have appeared in every single De Beers advertisement since 1948 and they also created "a situation where almost every person pledging marriage feels compelled to acquire a diamond engagement ring" through the use of different marketing tools to establish reputation and customer loyalty so that potential firms will find it difficult and costly to enter the market. In addition, the monopoly's demand becomes relatively less price elastic and thus, the monopoly is able to charge a relatively high price for its product. The myth that supply was scarce helped it to maintain high prices.**
- **Gaining control over supplies of essential raw materials can be considered a strategic barrier. In the case of diamonds, if a firm owns all the diamond mines (as De Beers effectively did in the 1870s), it has control of the production process. A new firm cannot simply enter the market without gaining control of a mine. By gaining control over the diamond mines, De Beers ensured that the smaller amounts of diamonds came onto the market and effectively controlled the supply of diamonds in the market, hence keeping prices relatively high.**
- **Hostile takeovers and acquisitions involve the dominant company buying up a rival firm or taking a stake in a rival firm. For example, between the late 19th and 20th Century, De Beers ran most of the diamond mines in South Africa, Namibia and Botswana that long produced the bulk of world supply of the best gemstones. For decades, if anyone had rough diamonds to sell on the side, De Beers bought these too, adding them to the mix.**
- **Due to its complete barriers to entry, the monopoly can use its long run supernormal profits to finance its research and development to develop new products or improve on its production process to lower costs (reflected by a downward shift of the LRAC curve) so as to further entrench its market power. However, the lack of existing competition due to huge barriers may also make it less willing to do so.**
- **Some strategic barriers may be deemed anti-competitive by the British and EU competition authorities for example, hence may be illegal.**

Although there are high barriers to entry, most markets, including monopoly, will demonstrate some degree of contestability in the long-run.

- **Statutory barriers**

- Statutory barriers are entry barriers given by force of law. The incumbent firm attains legal protection in the form of exclusive rights e.g. patents, copyrights, market franchises, licenses.
- Governments can create or support private monopolies through regulation of **Intellectual property rights**. **Patents and copyrights** give people who invent or create something the exclusive right to produce and sell it for a given period of time. For instance, by forbidding the use of a chemical formula by other manufacturers, patents allow pharmaceutical companies to act temporarily as monopolists in the market for a particular drug. This has the effect of **keeping demand high and relatively less price elastic** which in turn keeps the price of the patented drug relatively high until the patent expires and competitors enter the market with a generic version of the same drug.

Note:
It is important to be able to explain with the use of examples, the different types of BTE – artificial & natural BTE.

• **Natural or structural barriers to entry**

- Natural or structural barriers arise from **differences in production and costs between incumbent/existing firm and potential entrant**. **Capacity expansions** (ie. Operating on a larger scale of production) by the incumbent results in lower unit costs of production through exploiting more fully available internal economies of scale. This will enable the incumbent firm to be more cost efficient and in turn lead to a much lower LRAC than that of a potential entrant. This allows the incumbent firm to be more price competitive than a potential firm which tends to operate on a smaller scale (hence a higher unit cost of production incurred). In this way, the potential firm is deterred from entering the market.
- In some cases, a natural monopoly may emerge. A **natural monopoly** is a market in which the market demand is large enough to support only one large firm operating at or near its minimum efficient scale of production (MES).

• **Barriers to exit (sunk costs)**

- The financial implications of leaving an industry also act as a barrier to entry of new firms because they increase the risk of making huge losses if these firms decide to leave a market. A good example of barriers to exit is the presence of **sunk costs**.
- Sunk costs are costs, which once committed, cannot be recovered. Sunk costs arise because some activities require specialized assets that cannot readily be diverted to other uses. Second-hand markets for such assets are therefore limited. Examples include:
 - Capital inputs that are specific to an industry and which have little or no resale value.
 - Money spent on advertising, marketing and research and development projects that cannot be carried forward into another market.
 - Money spent on building expensive and complex IT systems that are subsequently ditched because they are unworkable.

Complete (or high) barriers to entry protect the monopoly power of the incumbent firm so

that it can charge a relatively high price above its MC. By protecting the incumbent firm from actual competition, the incumbent firm is also able to retain its supernormal profits in the long run.

Barriers to entry however are usually temporary because potential firms drawn by the supernormal profits will develop new technologies and devise price strategies to break into the market. In the case of De Beers, as recently as 1998, it accounted for nearly two-thirds of supply of the world's diamonds. Today production from its own mines gives it a mere 45% share because other big miners got hold of their own supplies of diamonds, far away from southern Africa and from De Beers's control. Hence the monopoly faces a continuous task of maintaining such barriers.

iii. Unique product - No close substitutes for the product

As a result of strong entry barriers, the lack of a close substitute for its product is an essential part of the definition of a monopoly. In the case of the diamond market, one of the keys to De Beers's success is that it persuaded many people through clever marketing to perceive diamonds as a good with no close substitutes even though a diamond is simply a sparkly stone that look nice in jewelry and there are rubies, sapphires and emeralds that might be able to rival it. The famous phrase "A diamond is forever" was the invention of a De Beers advertising campaign that ran in the US from the late 1930s to the late 1950s. Within one generation, De Beers created the idea that the diamond is the recognized symbol of betrothal.

Hence, given the lack of close substitutes, the monopoly has relatively greater price-setting ability than firms in other market structures. Thus, the demand for the monopolist's output is relatively less price elastic than the demand for firm's output in other market structures. The price elasticity of demand and cross elasticity of demand for the monopolist's output is also relatively low compared to other market structures.

iv. Imperfect Knowledge

Consumers are not fully aware of the costs and production of the product. Often times, the technology used in the production is closely guarded e.g. through the use of patents. This further increases the price-setting ability of the monopolist.

How the Characteristics Affect the Price and Output Decisions of a Profit-Maximising Monopolist (Marginalist Approach)

The traditional theory of the firm assumes that the monopoly seeks to maximise profits.

The first step in understanding how a monopolist maximizes its profits using the marginalist approach is to explain the relationship between the average revenue curve and marginal revenue curve of the monopolist.

Assuming the monopolist charges a uniform price for every unit of his product, then the demand curve for the firm's output is also its average revenue (AR) curve. Recall that the demand (or AR) curve for the monopolist's output is downward sloping, its MR curve also slopes downwards (figure 5b). The monopolist's price (AR), however, is always greater than its MR at any output (except for the first unit).

Figure 5b



- MR curve is negatively sloped and MR is always less than AR (or price) in an imperfect market structure for every corresponding level of output because:
 - Assuming the monopolist charges a uniform price for every unit of his product, it has to lower price on all units in order to sell an extra unit. Thus, the MR is equal to the price he receives from the sale of the last additional unit minus the loss of revenue from the sale of all other units at a lower price.
 - *Note: The mathematical relationship between AR and MR for price setters is provided in Appendix 1. This relationship between AR and MR applies to firms in all imperfect market structures where the firms are price setters.*

Profit-maximising Condition of Monopoly

Assume that the monopolist seeks to maximize profits, the monopoly is in equilibrium if it is producing the level of output that maximises total profit. In order to maximize total profits, the rational monopoly has to make output decisions at the margin by weighing its marginal costs (MC) against its marginal revenue (MR). The profit-maximising monopoly is in equilibrium only when the following condition is met: $MR = MC$ (this applies to all firms in imperfect market structures).

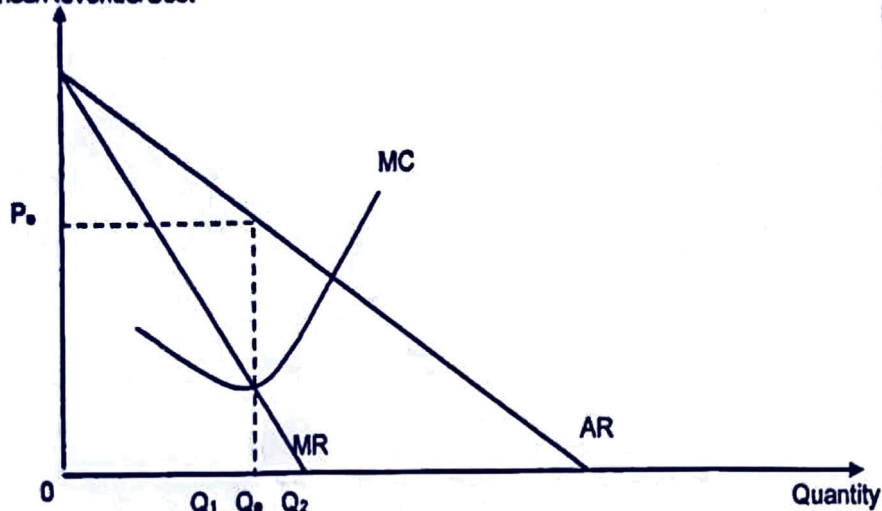
This is similar to the explanation for the PC firm except that the MR is downward sloping for monopoly.

Figure 6 illustrates the profit-maximising output level of a monopoly. The profit-maximising output level is at OQ_0 , where marginal revenue is equal to marginal cost. This is because:

- At output level Q_1 , MR is greater than MC. Each additional unit of output sold adds more to revenue than it adds to cost. This increases the profits of the firm. The firm should expand output beyond Q_1 .
- On the other hand, if output expands beyond Q_0 , for example at Q_2 , each additional unit sold adds more to cost than to revenue. Now MR is less than MC. So each additional unit reduces the profits of the firm.

It is only at output Q_0 where $MR=MC$ that the firm will be in equilibrium i.e. the firm has maximised its profits. It will charge a price of P_0 based on the demand curve

Figure 6: Profit-maximising Monopoly
Price/Revenue/Cost



Important result:
The price charged under monopoly is higher than the marginal cost at the profit-maximising output.

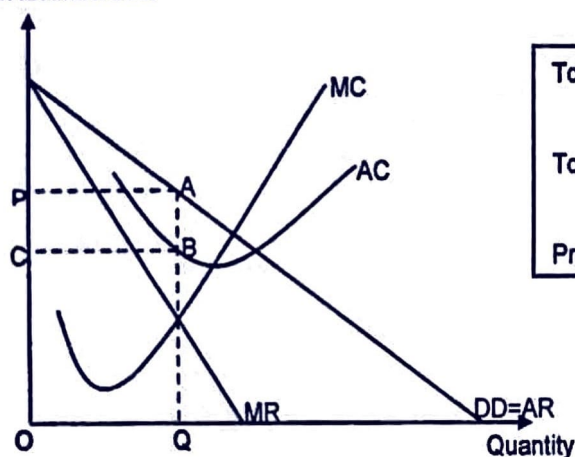
How does this compare PC?

3.2 Short Run and Long Run Equilibrium of a Profit-Maximising Monopolist

Using its profit maximizing output of Q_0 , where $MC=MR$, it will charge a profit maximising price of P_0 based on the market demand curve. In the short run, a profit-maximising monopolist may be earning supernormal, normal or subnormal profit.

Figure 7a: Supernormal Profit ($TR > TC$ or $AR > AC$)

Price/Revenue/Cost



Total Revenue = $OPAQ$

Total Cost = $OCBQ$

Profits = $PCBA$

Figure 7b: Normal Profit ($TR = TC$ or $AR = AC$)
Price/Revenue/Cost

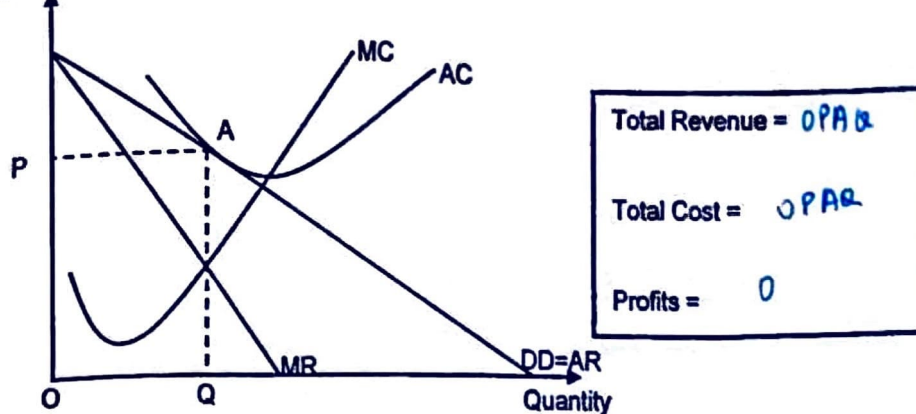
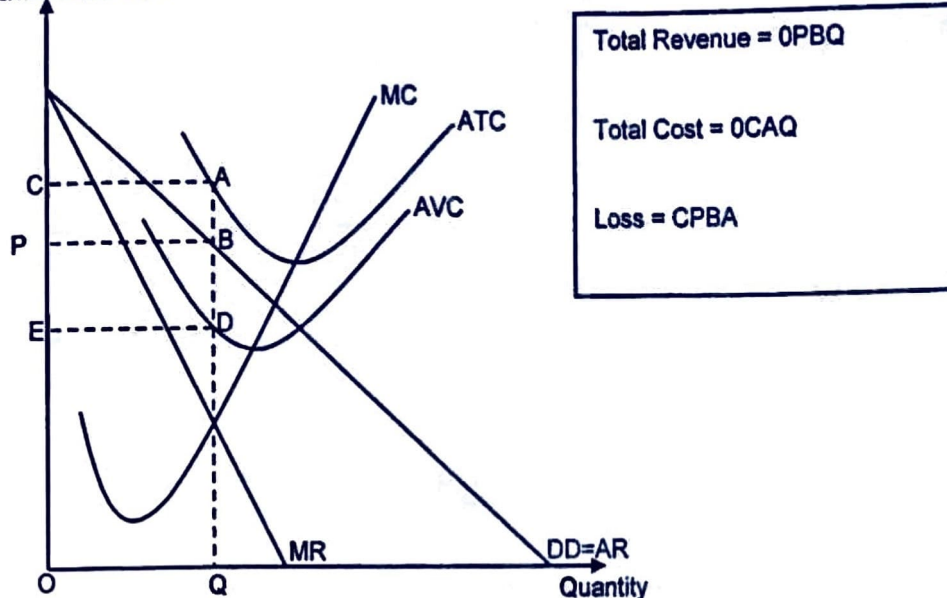


Figure 7c: Subnormal Profit Equilibrium
(assume $TR < TC$ but $TR > TVC$ (or $AR < ATC$ but $AR > AVC$))
Price/Revenue/Cost



Though the monopolist is the only seller in the market, there is no guarantee that it will not make a loss in the short run.

Like a perfectly competitive firm, when a loss is incurred, the monopolist will aim to minimise its losses. The equilibrium of the firm where $MR = MC$ is now the loss-minimising level of output. It will continue production so long as total revenue is able to cover at least all total variable costs of production in the short run.

The monopolist will continue production in the short run when its total revenue is greater than its total variable cost, as shown in Figure 7c.

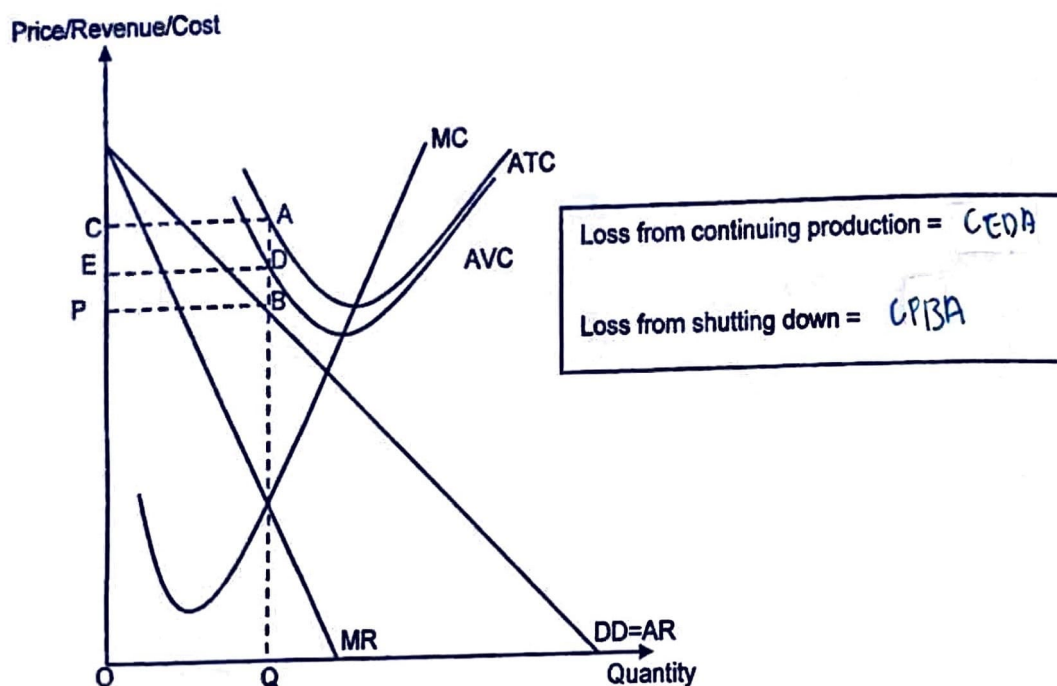
Loss if production continues = $CPBA$

Loss if shut down = $TFC = CEDA$

In this case, the monopolist incurs a smaller loss if it continues production. This is because by producing OQ, its total revenue is enough to cover all the variable costs (area OEDQ) and some of the fixed costs (area EPBD). (Note that the vertical distance between ATC and AVC is the AFC.)

TR	=	OPBQ
TVC	=	OEDQ
Part of TFC recovered when OQ is produced	=	EPBD

Figure 7d: Short-run shut down of a monopoly (assume $TR < TVC$ or $AR < AVC$)



In figure 7d the loss from shutting down is less than the loss from continuing production. The monopoly will choose to shut-down in the short-run and exit the industry in the long-run if the situation is unchanged.

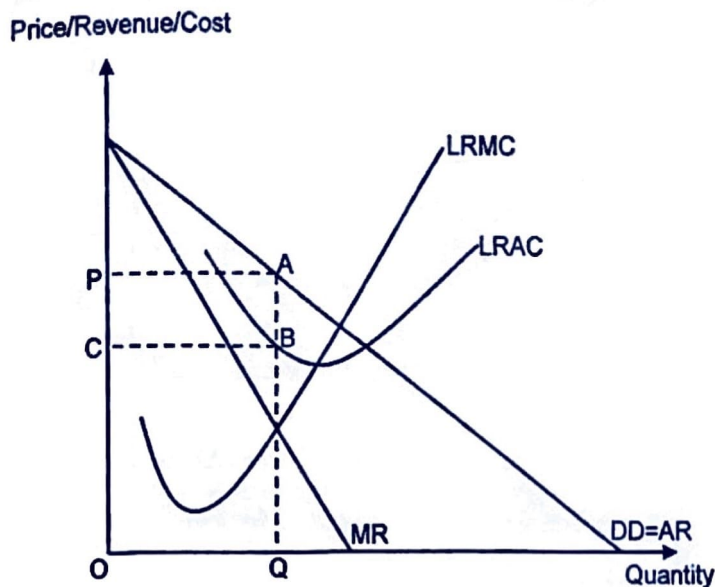
Long Run Profits:

It is possible for the monopolist to retain its supernormal profits in the long run by erecting huge barriers to entry. In the long run, a monopolist, like any profit-maximising firm, will remain in business only if it can at least make normal profits or break even. Thus, the long run equilibrium of a profit-maximising monopoly is the output level where $LRMC = MR$ and TR is at least equal to TC .

A monopoly can retain supernormal profits by preventing new entrants via erecting significant BTEs.

Figure 7e illustrates a monopoly making supernormal profits in the long run.

Figure 7e: Supernormal Profit ($TR > TC$ or $AR > AC$)

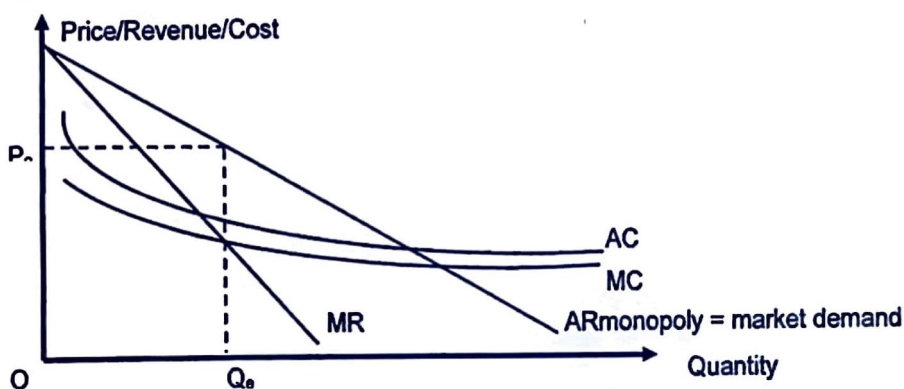


3.3 Natural Monopoly

In some markets, internal economies of scale are so large relative to the market size that competition between two or more firms simply does not make much sense; in these cases, the required infrastructure is too costly to replicate, hence a natural monopoly arises. A **natural monopoly** is a market in which the market demand is large enough to support only one large firm operating at or near its minimum efficient scale of production (MES). Figure 8 illustrates the revenue and cost curves of a natural monopoly. The LRAC curve of the natural monopoly falls continually over the entire market demand, resulting in a very large MES relative to market demand.

Alternative definition:
A natural monopoly results from the high capital outlay in some markets, which is a natural barrier to entry. The LRAC falls continually, enabling the incumbent to reap significant IEOS.

Figure 8



The electricity-supply market is an example of a natural monopoly. This is because to operate in the electricity-supply market, a firm has to incur overhead costs that are prohibitively high. These overhead costs include the costs of building power plants and huge systems of distribution poles and wires. The overhead costs are also relatively high compared to the variable costs of supplying another unit of electricity. Hence, the firm that can sell the most electricity can spread its overhead costs more widely over a larger output level and can in turn exploit available technical economies of scale more fully. This in turn will enable the natural monopoly to achieve a lower long run cost per unit than a firm with the same overhead costs but lower output.

With the lower unit cost, the incumbent can deliberately reduce the price of its product to ward off potential entrants. New market entrants tend to operate on a smaller scale and hence new entrants are unable to compete effectively with the incumbent firm which is already operating on a larger scale. This natural barrier thus discourages potential new firms from entering. The result is that one big firm can have a large cost advantage in providing all of the electricity for a given region.

Sectional Summary:

1. The four characteristics of a monopoly include being the only sole seller in the market, selling a unique product, imperfect knowledge and high barriers to entry and exit.
2. There are different types of barriers to entry and exit. They can be categorized into artificial barriers and natural barriers.
3. The monopolist is a price setter. The profit-maximising monopoly can use the marginalist approach to set its output level. The profit-maximising output level of the monopoly occurs where $MR=MC$ (this applies to price-setting firms in all market structures).

Note: Students are expected to be able to explain and/or illustrate each of the above statements.

4 MONOPOLISTIC COMPETITION

Monopolistic competition is seen primarily as a market structure whereby a relatively large number of small firms that sell similar but differentiated products, and barriers to entry and exit are low and information is imperfect. The sellers still retain a certain degree of market power because their products are differentiated.

Unlike perfect competition, there is no market demand curve for monopolistic competition. This is primarily because many prices prevail due to product differentiation and the lack of perfect knowledge amongst consumers and sellers. There is no one single equilibrium price in the market.

Some examples of firms operating in monopolistic competition include hawker stalls in Singapore, clusters of coffee shops and fast food outlets in a busy town centre to hairdressers in a local area. Small scale nurseries and care homes for the elderly might also fit into the market structure known as monopolistic competition.

4.1 Characteristics of a Monopolistic Competitive (MPC) Market Structure

I. Large number of small buyers and sellers relative to market size

There is a large number of small firms relative to the market size at any point in time such that each firm has a relatively small share of the total market. This arises from the low barriers to entry. For instance, in Singapore, each hawker stall operates on a limited scale such as a small stall space, limited amount of cooking and eating utensils, each stall owner hires only one or two helpers.

With each firm having a relatively small share of the market, each firm's market power is limited, meaning its ability to set price above its marginal cost is limited.

In addition, each firm acts independently of the other. No firm attempts to take into account the reaction of all its rival firms because not only is that impossible to do with so many rivals, retaliation by rivals is also less likely to occur since if a firm lowers its price, its gains in sales revenue will be spread thinly over many of its rivals. Since the extent to which each rival firm suffers is negligible, each firm is able to determine its price-output policy with little consideration of the possible reactions of rival firms, quite unlike the mutual interdependence seen in an oligopoly. (To be covered in the next section)

The MPC firm, however, prefers to engage in non-pricing competition to differentiate their products from their rivals because through product differentiation, they are able to maintain customer loyalty which provides the firm with a certain degree of market power to set price.

ii. Low barriers to entry and exit

The large number of small firms existing in the MPC market structure is a result of low barriers to entry and exit which include relatively low start-up costs, relatively easy to copy technology and relatively mobile factors of production unlike in markets dominated by large firms. Low barriers make it easier for firms to enter or leave the industry, thus ensuring a large number of small firms. For instance, it is relatively easy to apply for licenses to operate a hawker stall compared to other industries like the telecommunication industry. The costs of setting up a hawker stall is also relatively low because overhead costs like the costs to set up cooking facilities is relatively low. Rental costs can also be relatively low.

With very low barriers to entry, firms in monopolistic competition can only make normal profits in the long run because potential entrants can easily enter the market and erode the supernormal profits existing firms make. The inability to retain supernormal profits in the long run restricts the ability of MPC firms to engage in large-scale advertising or invest huge sums of money in research and development, hence products are only slightly differentiated. Nonetheless, the presence of many rivals makes product differentiation necessary. Thus, firms in monopolistic competition do engage in advertising and promotion, but on a relatively small scale. Advertising can be in the form of flyers or off-peak time slots on television and the classified sections of newspapers.

iii. Differentiated products

Products are slightly differentiated in the MPC market structure, in other words, there are many close substitutes available. Product differentiation can take 3 forms:

- **Real physical differences:** Through product development and innovation, goods that serve a similar purpose are altered in such a way that they differ in some (minor) ways eg. differences in the materials used in the production of the good and in workmanship.
 - For example, in the case of hawker stalls in Singapore, there are many varieties of food in each hawker centre such as Chinese cuisine, Malay cuisine, Indian cuisine and Western cuisine. There is also variation within each food type. Chicken rice is frequently differentiated through taste and flavor because cooking styles differ between stalls or each stall has a slightly different recipe.

The extent in which a firm is able to raise its price above marginal cost is known as the markup. The markup is an indication of the market power of a firm.

Be prepared to explain a real-life example of low BTE for an MPC mkt structure in your essay.

- **Imaginary differences:** Other than quality, products can also be differentiated by design, packaging, branding and method of promotion. This can be achieved through non-price competitive techniques such as marketing techniques, advertising and packaging. These serve to inform, persuade and convince consumers to purchase the products. This may increase demand for the firm's product as well as to make demand relatively less price elastic, giving firms a greater leeway to raise prices without fear of a loss of market share.
- **Differences in conditions of sale:** This is achieved through differences in location of shops and quality of service such as level of customer service and ambience.

Due to the absence of long-run supernormal profits in monopolistic competition because of lack of entry barriers, the extent and scale of non-price competition is relatively limited.

As a result of product differentiation, each MPC firm has some degree of control over its own prices, unlike in perfect competition. The demand curve for a monopolistically competitive firm is therefore downward sloping. But compared to an oligopoly or monopoly, the demand for the firm's products is relatively price elastic as there are a large number of close substitutes. This severely limits the 'market power' of each monopolistically competitive firm. In order to maintain market power, the firms have to ensure that their products are clearly differentiated from their rivals.

iv. Imperfect knowledge

Sellers and buyers have imperfect information regarding production methods and prices. In the case of hawker stalls, rivals don't have complete information regarding all ingredients used by a hawker and consumers don't have complete information regarding ingredients used by the hawkers or all available prices offered by all hawkers.

Note:
Product differentiation is the main source of market power for MPC firms.

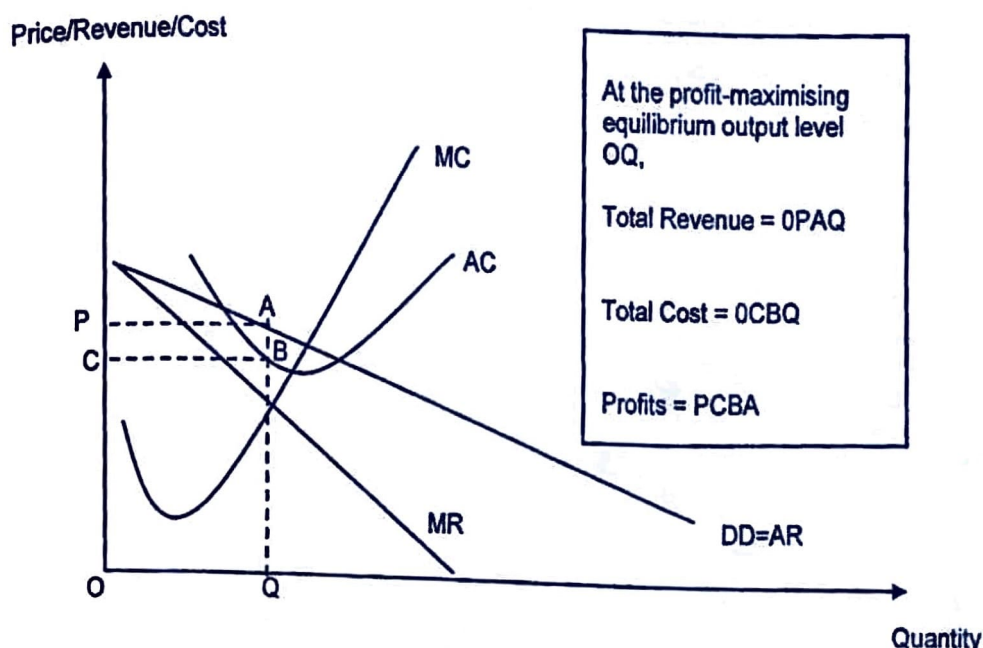
How the Characteristics Affect Pricing and Output Decisions of a Profit-Maximising Monopolistically Competitive Firm

4.2 Short Run Equilibrium of a Profit-maximising MPC Firm

Depending on its cost and revenue conditions, the firm in monopolistic competition may earn supernormal, normal or subnormal profits in the short run. If it earns subnormal profits, so long as it is able to cover its variable costs, the firm will continue production in the market. If it cannot cover its variable costs, the firm will shut down and stop production temporarily in the short run.

Figure 9 illustrates the revenue and cost curves of a typical MPC firm making supernormal profits.

Figure 9: Supernormal Profit ($TR > TC$ or $AR > AC$)



4.3 Long Run Equilibrium of a Profit-maximising MPC Firm

Due to low barriers to entry, in the long run, a monopolistically competitive firm makes only normal profits. When incumbent firms make supernormal profits, new firms will enter the industry. On the other hand, when the firms make subnormal profits, firms that cannot cover their total variable cost will shut down and leave the industry.

Note:
The MPC firm only make normal profits in the LR despite its price-setting ability.

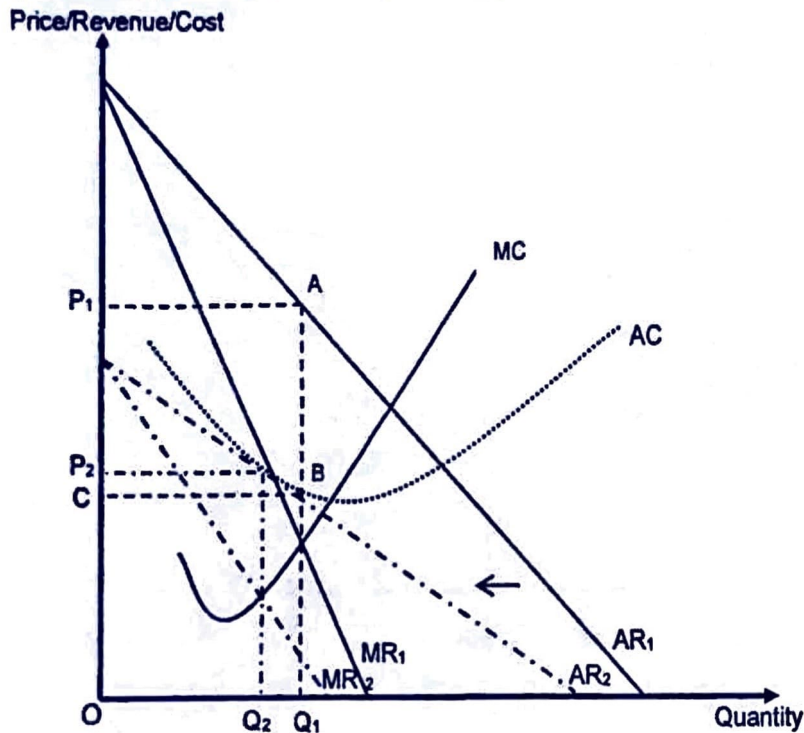
Adjustment from Short Run Supernormal Profits to Long Run Normal Profits

Assume that the profit-maximising firm in monopolistic competition is initially earning short run supernormal profits. The initial profit-maximising equilibrium of the firm is at output OQ_1 and price OP_1 , where $MR_1 = MC$. Supernormal profits is area P_1ABC in Figure 10. The ease of entry allows new firms to enter the industry. They sell products that are potential substitutes to those sold by existing firms. Consumers now have a wider range of products to choose from.

Assuming total market demand for the product remains unchanged, the entry of new firms will cause the demand for each firm's product to fall. At the same time, demand for the firm's product also becomes relatively more price-elastic as more substitutes are available.

The demand curve shifts from AR_1 to AR_2 until it is tangential to the AC curve at output OQ_2 where it makes only normal profits. Output OQ_2 is also the new and lower profit-maximising output level where MR_2 equates MC. The equilibrium price has also fallen to OP_2 .

Figure 10: Adjustment from SR supernormal profits to LR normal profits



Adjustment from Short Run Subnormal Profits to Long Run Normal Profits

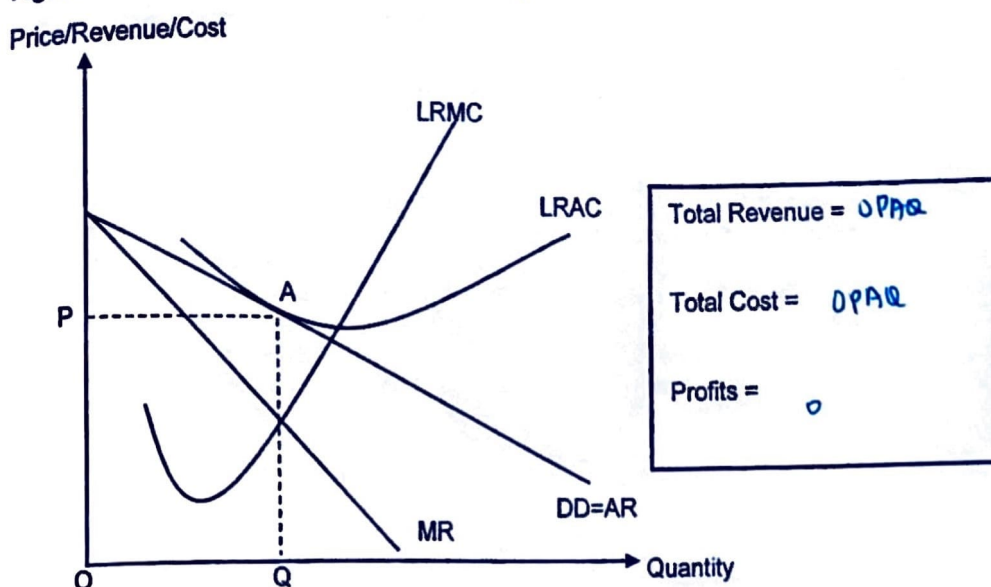
If the firms in monopolistic competition are making SR losses, those whose $TR < TVC$ will be forced to leave the industry as the barriers to exit are low. There will be fewer firms left. This means fewer competitors. Therefore, the demand for the existing firm's product rises and becomes relatively less price-elastic. This is illustrated by the AR curve shifting to the right and becoming relatively steeper until it is tangential to the AC curve where it makes normal profits. The resultant increase in price has led to a reduction in losses until the long-run equilibrium of normal profits is restored.

The reality, however, is that a stable equilibrium is never reached because new products come and go all of the time. Existing products within a market will typically go through a product life cycle that affects the volume and growth of sales.

Long-run Equilibrium of the Profit-maximising MPC Firm

In the long run, the profit-maximising MPC firm can only make normal profits due to low barriers to entry and exit, as shown in Figure 11.

Figure 11: Normal Profit ($TR = TC$ or $AR = AC$)



Sectional Summary:

1. The four characteristics of MPC are large number of small firms relative to market size, slightly differentiated products, imperfect knowledge and low barriers to entry and exit.
2. The MPC firm is a price setter because its products are slightly differentiated.
3. The profit-maximising MPC firm
 - Can make supernormal, normal or subnormal profits so long as $TR > TVC$ in the short run.
 - Can only make normal profits in the long run due to low barriers to entry and exit.

Note: Students are expected to be able to explain and/or illustrate each of the above statements.

5 OLIGOPOLY

An oligopoly is a market dominated by a few large firms where market concentration is high, hence these firms are mutually dependent and must consider the reactions of rivals to its price, non-price and output decisions. Other characteristics of an oligopoly include high barriers to entry and exit and imperfect knowledge. Oligopolies can produce homogeneous or differentiated products.

Mutual dependence or interdependence is a key distinguishing feature of oligopoly.

5.1 Characteristics of an Oligopoly

i. A few dominant firms relative to market size

These few firms each command a large proportion of the market share and have relatively high market power, hence they have the ability to set price and are price setters. Duopoly is the Greek word for "two sellers" dominating the market while

oligopoly refers to "few sellers" dominating the market.

The degree to which oligopoly power has developed in any industry is indicated by measuring the market concentration ratio i.e. the extent to which firms dominate the market or industry in terms of market share. It can be measured as a 3-firm, 4-firm or 5-firm concentration ratio.

For example, a 3-firm concentration ratio is the sum of the market share of the 3 largest firms in the industry. In the table below, it is shown that the global brewery industry is an oligopoly because the 3 largest firms have a combined market share of 69.4% of the global brewery market.

Be prepared to calculate the concentration ratio at the exam.

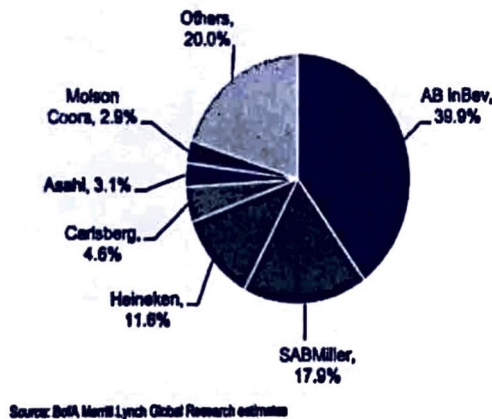


Figure 12: Market Share of Top Beer Firms in the Global Brewery Industry

Source: <http://www.businessinsider.sg/sabmiller-ab-inbev-would-dominate-the-beer-market-2015-9?r=US&IR=T&h8VXPrMIDs8VjBmU.97>

Other examples include:

- The global car manufacturing industry is dominated by Volkswagen, Toyota, General Motors and BMW
- The U.S. music industry is dominated by 4 major music recording labels (Universal Music Group, Sony Music Group, Warner Music Group and EMI Group)
- Telecommunication service providers in Singapore (Singtel, Starhub and M1)
- Petrol retailers in Singapore (Exxon Mobil, Shell, SPC, Caltex)
- The dominant global oil producers include OPEC (Organisation of the Petroleum Exporting Countries of which the 5 founding members include Iran, Iraq, Kuwait, Saudi Arabia and Venezuela), Russia, U.S. and China

An oligopoly market might have dozens or even hundreds of individual firms but most of them are unimportant in the industry; a small number of them—perhaps only 2 to 20 firms—dominate the industry.

Due to the presence of a few dominant competitors in the market, a high degree of interdependence or rival consciousness exists amongst firms in an oligopoly. Hence, every action taken by any single dominant firm will affect the sales of all the other firms in the market significantly. Rivals' actions cannot be ignored as they are likely to result in significant effects. For instance, mutual interdependence exists within the U.S. fast food market. If you are in charge of a company in an oligopoly, it is a vital part of your job to keep an eye on competitors. Wendy's CEO would keep a close eye on its rivals' activities, such as if McDonald's had just introduced a new kind of burger or that Burger King was offering promotional discounts on sodas. This is because McDonald's and Burger King's behavior will affect the sales and profitability of Wendy's.

ii. High barriers to entry

The existence of high barriers to entry and exit result in the high market concentration within the oligopoly and its corresponding high degree of interdependence.

Note: Some examples of the barriers to entry would be applicable to monopoly as well.

- **Artificial barriers to entry – include statutory barriers and strategic barriers.**

- **Strategic barriers. Examples:**

- **Limit and predatory pricing** occurs when prices are deliberately set very low by a dominant competitor in the market in order to restrict or prevent competition. Limit pricing involves charging a price that is lower than the profit-maximising price. The intent is to prevent rivals who typically operate on a smaller scale of production and hence incur higher long run unit costs of production from entering the market because the potential entrants cannot match the price of the incumbent firm without incurring a loss. Predatory pricing involves lowering prices below costs to drive out existing competitors and scare off potential entrants. Whatever the approach, limit and predatory pricing is illegal under competition law in many countries.
 - In an oligopoly, **advertising and branding** plays a huge role in establishing brand loyalty, making it difficult and costly for potential firms to break into the market. For instance, Coca-Cola Company and PepsiCo are the two dominant players in the cola industry. It is hard for new cola manufacturers to break into the global market for cola. This is partly because both Coca-Cola and Pepsi have successfully built such strong brands that it would be tough to persuade consumers to switch to new colas. Even blind taste tests have found that most people (including those who claim to be ardent fans of one brand or the other) cannot distinguish between them when they do not know which they are drinking. This seems to be a clear example of an industry in which advertising mainly serves to persuade people that the products are more different than they really are.

- **Statutory barriers**

- Statutory barriers have been *discussed in detail earlier in section 3.1.*

- **Natural barriers in an oligopoly**

- The few dominant firms in the oligopoly enjoy **substantial internal economies of scale**. This means that the long run average cost for the firm falls over a very large output. A new entrant is unlikely to be able to produce at a scale of production that matches that of the incumbent firms due to an initial lack of consumer base – as such, it is difficult for the new entrant to produce at an output level that is close to the MES. This means that its AC of production is likely to be higher than the incumbent firms who are producing at an output level closer to the MES. Thus, this will make it harder for new entrants to compete with dominant firms in the market.

Due to the high barriers to entry and exit, an oligopoly is able to retain its supernormal profits in the long run.

III. Products can be homogeneous (standard) or differentiated

In some industries, the product is homogeneous (e.g. metals, chemicals, petrol, crude oil) while in others, it can be differentiated (e.g. cars, soft drinks).

When the products are homogeneous, the oligopoly is known to be pure or perfect. Theoretically only one price can prevail, but each firm has control over its pricing policy (that is, each firm is a price setter) because the market is dominated by a few firms.

When the products are differentiated, the oligopoly is considered to be an imperfect one. Here, there may be less fear of immediate reaction from rivals because rivals may perceive the change in price to be due to modifications made to the product. However, due to the market being dominated by a few large firms, rivalry and interdependence still prevails among these firms in the market.

Product differentiation tends to occur on a bigger scale in an oligopoly than in a monopolistic competitive market structure as a result of huge funding in research and development or very large-scale advertising. This is because unlike MPC firms which can only make normal profits in the long run due to low entry barriers and exit, oligopolies are able to retain supernormal profits in the long run due to high barriers to entry. Oligopolies are thus incentivised to use these non-pricing strategies extensively to maintain their grip of the market share. For instance, research and development can increase the range and quality of products. This may increase the demand for the firm's products as well as make demand relatively more price inelastic.

A case in point would be the mobile phone makers e.g. Apple vs Samsung (top 2 dominant manufacturers in the smartphone manufacturing industry).

IV. Imperfect knowledge

Sellers and buyers have incomplete information regarding production methods and prices. The imperfect knowledge of production methods serves as a barrier to entry of potential new firms. Consumers' imperfect knowledge about prices also increase the price-setting ability of the oligopoly.

How the Characteristics Affect Pricing and Non-Pricing Decisions in an Oligopoly

Due to the market being dominated by a few large firms, the success of firms in this market is largely determined by the actions of its major rivals, in other words, they are **mutually dependent**. Hence, each firm will monitor the actions of major rivals closely because their actions will affect the former and they are never certain of how rival firms will **actually react**. Given that each firm faces a considerable amount of **uncertainty** about demand, competitor's costs, actions and responses to their strategies, there is **no single theory** on pricing and output decision of firms in an oligopoly, hence it is **often difficult** to predict the oligopoly's behavior.

Price and non-price decisions in an oligopoly are influenced by the nature of the oligopoly – whether it is a collusive or non-collusive oligopoly.

For instance, due to the considerable amount of uncertainty in the market, prices are generally stable in an oligopoly, yet price wars may also break out between them. Oligopolies may choose to set a price and output level that enable them to profit-maximise whereas at other times, to reduce uncertainty, they may collude.

5.2 Cooperative Model - Collusive Oligopoly

Collusion occurs when the firms work together to reduce uncertainty in the market

and increase the predictability of their rival's reactions to their pricing decisions to maximize profits. When firms collude, they may agree to limit competition among themselves through agreed output quotas or fixed prices or limits on the extent of product promotion or development or agreements not to poach each other's markets. As such, firms may engage in a formal or informal agreement among themselves to reduce the degree of competition under the collusive model.

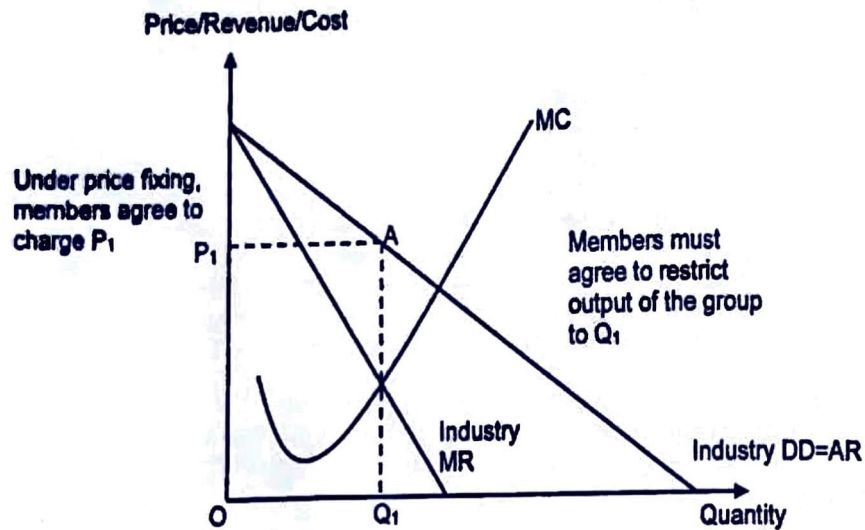
- i. The main conditions for collusion to be effective:
- The market is dominated by a few large firms to allow for coordination of prices of output among the members. This will enable firms to *monitor members to prevent cheating*.
 - Firms sell similar products – products must be perfect substitutes or very closely related. For example, automobile/cars (Honda being a price leader), petrol stations. The greater the extent of product differentiation, the less effective collusion will be (for example, difficult to synchronize prices).
 - No government efforts to curb collusion (e.g., antitrust lawsuits).
 - Firms have similar cost structure such that coordination becomes easier.

Types of collusion

5.2.1 Cartels

- To reduce uncertainty arising from mutual interdependency between sellers in an oligopoly, sellers may formally collude and form a cartel and agree to maximize joint or industry's profits. Firms may join a cartel to increase their market power since members work together to determine jointly the level of output that each member will produce and/or the price that each member will charge, *behaving like a monopolist*.
- If each firm in an oligopoly sells homogenous product like oil, the demand curve that each firm faces will be horizontal at the market price. However, if the oil-producing firms form a cartel like OPEC to determine their output and price, they will jointly face a downward sloping market demand curve (like a monopolist). The cartel's marginal cost curve is the horizontal sum of the individual members' marginal cost curves. As such, the cartel's profit-maximizing decision is the same as that of a monopolist. The cartel members choose their combined output at the level where their combined marginal revenue equals their combined marginal cost.
- According to figure 13, by acting like a monopoly, joint profits are then maximised at the price P_1 and output level Q_1 where the cartel's MC equals MR. Like a monopolist, the cartel will choose to produce less output and charge a higher price. For example, the OPEC will produce lower output and charge a higher price than what they would have done individually.
- In order to restrict total industry output to maximize joint profits, each firm is given a production quota. Cartel members have to agree on how to divide the market between them and the agreement is usually based on their current market share.
- Example: The Organisation of Petroleum Exporting Countries (OPEC)

Figure 13: Joint profit maximisation in a cartel



However, there are factors that limit the effectiveness or success of the cartels:

- **Cartels are illegal.** However, OPEC is legal. Formal agreements among companies to dictate sales or production – are bluntly illegal but OPEC is a multinational organization, which comprises of countries with nationalized oil companies. This means that the group can act in any manner that they deem in their countries best interest. Hence, no international laws exist to break their collusion. Furthermore, the US foreign trade laws protect the OPEC and the members meet regularly to decide how much oil each member of the cartel is allowed to produce.
- **There are lot of risks and uncertainty associated with cartels.** While firms in a cartel have a strong incentive to cooperate with one another to maximise joint profits, there is also an incentive to cheat 'secretly' in order to increase individual profits, which is above their share of the joint profits. This is because while the formal agreement maximizes joint profits, the firms are not able to produce at their profit maximizing level of output [production quota set by the cartel is lower than the member's profit maximizing output]. Hence, cartel members will be tempted to cheat on their agreement to limit production and produce more output than it has agreed to produce to increase its individual profits by producing more but continuing to sell at P_1 . However, when an individual member deviates from the production quota, the best strategy for other members is to follow suit and produce beyond their quota to maximize their individual profits. Sometimes, other members may simply do this to punish the cheater for deviating from the agreement. As a result, the market supply of the good will increase (above that of Q_1), driving down prices below that of P_1 . As a result, the collusive agreement (cartel) will break down, and every member will earn a profit that is below that of the joint profits. Thus, such agreements tend to be fragile, risky and uncertain, resulting in unstable outcomes. Therefore, members tend to stick to the agreement to avoid punishment if they are caught cheating. Nonetheless, there is a built-in incentive for each member to cheat in pursuit of its own self-interest. As such, the threat of punishment must be credible to reduce uncertainty and unstable outcomes in the cartel.
- **Most cartel arrangements experiences difficulties and tensions and some cartels collapse completely.** Collusion in a market/industry is easier to achieve if:

- **Monitoring members are easier.** Cartels are expensive to set up (especially when there is a large number of firms). If the number of firms are large, it is very difficult to monitor perfectly and detect cheating by the cartel members. Therefore, it is difficult to formulate a policy that meets the needs of every single member, making it easier for firms to pursue their own priorities. Therefore, the smaller the number of firms in the industry, the more successful the cartel is likely to be since behavior can be easily monitored.
- **The more standardized the product, the more similar the production methods and cost conditions, the easier it will be to reach an agreement on price and production quotas, or to change prices at the same time and by the same percentage.**
- **Market demand is not too variable (or cyclical) i.e. it is reasonably predictable and not subject to violent fluctuations which may lead to excess demand or excess supply.** This is because falling market demand creates excess capacity in the industry and puts pressure on individual firms to discount prices to maintain their sales revenue. When market conditions fluctuate wildly, it is also difficult to make agreements due to difficulties in predicting and due to the need to make frequent amendments to agreements.
- **Barriers to entry must be high** as new entrants may be attracted into the industry by the high profits, stealing the consumers away from the members. Profit from cooperation should always exceed profits from cheating/deviation, otherwise cartels will break up. Therefore, the more significant the barriers to entry, the less fear of disruption by new firms entering the market.

5.2.2 Price leadership model (Tacit collusion)

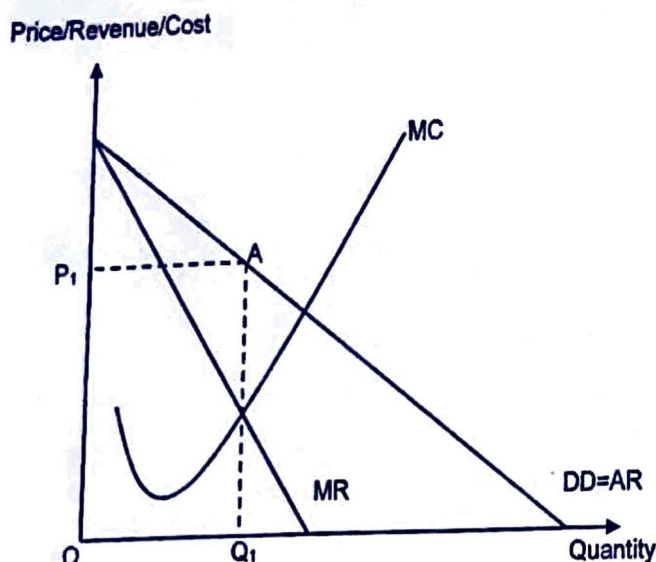
- Tacit collusion is informal where unwritten rules of collusive behavior arises. It consists of **price leadership (dominant + barometric) model** to determine the price and avoid undercutting each other. As such, the presence of incomplete information about motivation of other firms may induce tacit collusion.
- **Barometric model** – the firm that is more adept at identifying changes in market conditions and has the ability to respond more efficiently, will be the market/price leader. If firm is skilled in this area, other producers will follow its lead under the assumption that the price leader is aware of something that they have yet to realize.
- **Dominant firm model** – occurs when one firm controls the vast majority of the market share within an industry and/or enjoys the lowest average cost of production. As the dominant firm adjusts prices, any smaller firms within the segment must follow in order to maintain the small amount of market share they currently possess and avoid price cuts.
- As the price is set by the market leader in tacit collusion, it is widely accepted as the market price by other firms (fringe firms or followers). The price leader select the price and output combination that maximises its own profits. However, the price will also be deemed as the price that best protects the followers' market share and profits. Hence, prices tend to be stable in tacit collusion. When the leader initiates a change, other firms will follow. For example, in the case of cinema and taxi operators in Singapore, other firms (fringe firms) often follow suit when a dominant firm increases prices.

Refer to Appendix 2
for more information
on the price
leadership model.

5.3 Competitive Model

The diagram of a profit maximizing oligopoly firm is similar to that of a firm operating under imperfect competition with the slope of the demand curve steeper than that of a monopolistically competitive firm.

Figure 14a: Profit maximizing output and price of an oligopolist



5.3.1 Price Rigidity (Kinked Demand Curve Theory)

The kinked demand curve theory offers some insight as to why prices in an oligopoly tend to be sticky or rigid. According to the kinked demand curve model, prices are generally stable in an oligopoly because of the fear of competitor's reactions because of the high degree of mutual interdependency amongst the few large firms. Therefore, the demand that each oligopolist faces is determined by the output and pricing decisions of the other firms in the industry. Price rigidity also implies that prices does not change despite changes in cost conditions (marginal costs) unless it is significant.

As shown in Figure 14a, assume that the current price and output level of an oligopolist is at P_e and Q_e respectively. However, the firm faces the relatively elastic demand curve at high prices. As such, the firm's demand curve becomes relatively more elastic at prices above P_e because at these higher prices, consumers are more likely to switch to the lower priced products provided offered by other oligopolists in the market. For example, if the oligopolist increases its price above the equilibrium price P_e , it conjectures that other firms will not follow with the price increase of their own since they will make losses due to a fall in their total revenue. This is because if only oligopolist A raises its price and others leave their prices constant, the quantity demanded for oligopolist A's output will fall more than proportionately to the increase in its own price along the relatively elastic portion of the demand, leading to a fall in its total revenue.

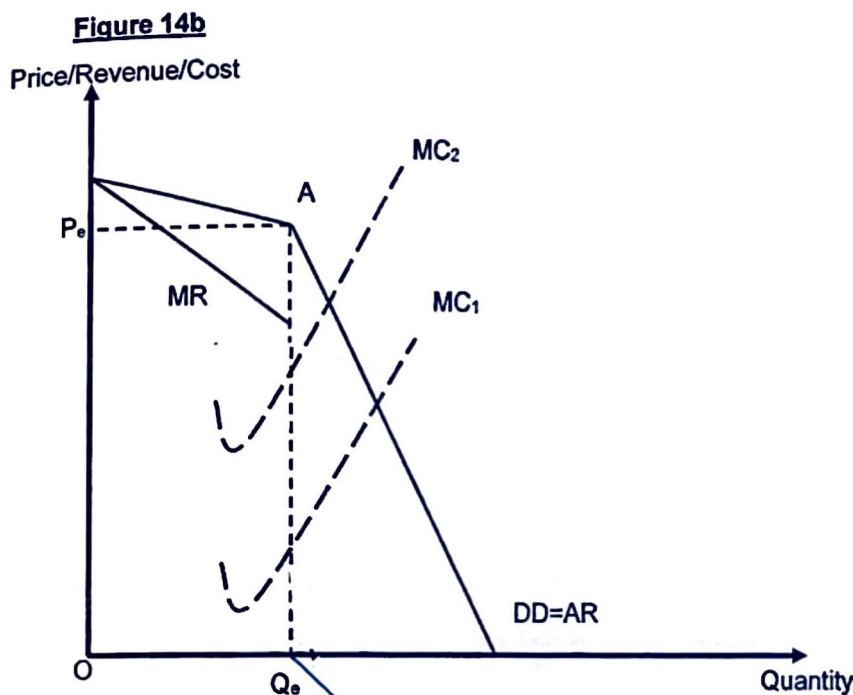
On the other hand, the firm faces a relatively more inelastic demand curve at low prices. Therefore, the firm's demand curve becomes relatively less elastic at prices below P_e because the other oligopolists in the market have also reduced their prices. For example, if the oligopolist A reduces its price below P_e , it conjectures that its competitors will follow suit and reduce their prices as well but it will reduce everyone's total revenue. This is because oligopolist A will not gain market share since everyone will reduce their prices to match its price. Its sales will expand only

in proportion to the expansion in the industry's sales. Quantity demanded for its output increases less than proportionately to the fall in its own price, leading to a fall in its total revenue.

The kinked demand curve gives rise to a marginal revenue curve that has a discontinuous section directly below the kink at Q_e . The higher and flatter MR curve before output Q_e corresponds to the higher and flatter demand curve before output Q_e . The lower and steeper MR curve after Q_e corresponds to the steeper portion of the demand curve after Q_e . The oligopolist produces Q_e , the output at which MC_1 crosses the MR schedule. The effect of the discontinuity in the marginal revenue curve at the current price-output combination means that should marginal cost rise within this region of discontinuity, from MC_1 to MC_2 , the oligopolist will absorb the higher costs instead of passing it to consumers in the form of higher prices. This means the oligopolist will leave the existing price-output combination of OP_e - OQ_e unchanged.

Nevertheless, according to figure 14b, prices tend to be rigid/stable at the kink at P_e since an oligopoly will be reluctant to change prices as price wars are unsustainable and lead to a suboptimal in the long run. Therefore, firms tend to avoid price wars and adopt an optimal strategy of engaging in non-pricing behavior to reduce the extent/degree of substitution for its products. Even when there is a shift in marginal costs of production, the profit-maximising strategy of each oligopolist will be to hold prices constant unless the change in marginal costs of production is significant. Hence, the kinked demand curve theory helps to explain oligopolistic price stickiness in the face of cost changes but it does not explain how that price is determined. Nonetheless, price wars are still evident during festive occasions where firms continue to slash prices to make greater sales or when the firms want to get rid of their old stocks. Recessions may also drive these firms to compete in prices.

A Graphical Illustration of the Kinked Demand Curve



Note:
The diagrammatic analysis of the kinked demand curve is not required. It is included in the lecture notes to aid your understanding of the concept.

5.3.2 Price Wars

Price wars tend to arise when there is considerable excess capacity in the industry and are likely to be initiated by firms with the largest minimum efficient scale. Rivals

that operate on a smaller scale have to shut down by stopping production temporarily in the short run since they face a higher unit cost of production as they cannot cover their variable costs. However, if they cannot cover total costs in the long run, they will have to leave the industry. When rivals exit the industry, the winner of the price will gain a larger market share since consumers will have to buy from the firm remaining in the industry. With lesser competition, the firm will have a greater market power, raising their ability to charge a higher price and hence earn higher profits. In other words, the firm that initiates the price war may make losses in the short run but with the intention of gaining greater market share eventually. However, these firms must have sufficient past supernormal profits to recuperate from these losses and sustain the price war or the threat of undercutting their rivals credible.

Interdependence thus pulls firms in an oligopoly in two different directions. On the one hand, there is an incentive to compete to gain a larger market share, while on the other hand, there is a strong incentive to collude to reduce uncertainty and risks by acting as one and maximise industry's profits. However, in some cases, firms may compete intensely for a period and then realise that maybe there is no winner. They then start to collude and jointly raise prices and reduce advertising (costs). Then, after a period of collusion, competition may erupt again. This may even be precipitated by the entry of a new firm, development of a new product design or changes in market demand. Nonetheless, firms just cannot resist the temptation to 'cheat' and undercut each other at times. Put simply, the behavior of oligopolies is unpredictable and may change over time.

5.3.3 Synthesis of oligopoly behaviour – Preference for non-price competition

Due to mutual dependence and uncertainty, oligopolists can either compete or collude. Unlike other market structures, the behavior of firms in oligopolistic markets varies according to the circumstances the firm is in. In view of the uncertainty, firms in an oligopoly tend to prefer the use of non-pricing strategies to differentiate their products to minimize the risk of price wars or a breaking collusive arrangement.

Sectional Summary:

- The characteristics of oligopoly are a few dominant firms with a high degree of mutual interdependency, differentiated or homogeneous products, imperfect knowledge and high barriers to entry or exit.
- Oligopolies face a considerable amount of uncertainty about demand, competitor's costs, actions and responses to their strategies, there is no single theory on pricing and output decision of oligopolistic firms, hence it is often difficult to predict the oligopoly's behaviour.
- There are competitive models and collusive models of oligopolies. Competitive models include the kinked demand curve theory. Oligopolies generally prefer non-price competition over price competition but price wars can arise occasionally too. Collusive models include cartels and the price leadership model (tacit collusion).
- Oligopolies can retain supernormal profits in the long run due to high BTE.

Note: Students are expected to be able to explain and/or illustrate each of the above statements.

6 DECISION-MAKING AND STRATEGIES

A PC firm cannot make pricing decisions but it can adjust its output level to maximise its profits.

Firms in imperfect market structures, on the other hand, can make decisions on both price and output. A firm's decision on which strategy to employ is motivated by one or more of the following considerations:

- Increasing revenue
- Lowering costs
- Competitors' actions
- Business risks and uncertainty considerations

In deciding on the strategy to implement, the firm has to consider its **objective(s)**, the various **constraints** it may face and the **costs** it has to incur in implementing these strategies. What are some potential constraints and/or costs a firm may face and/or have to incur when it uses a particular strategy? Are there **unintended consequences** that may arise from the strategy?

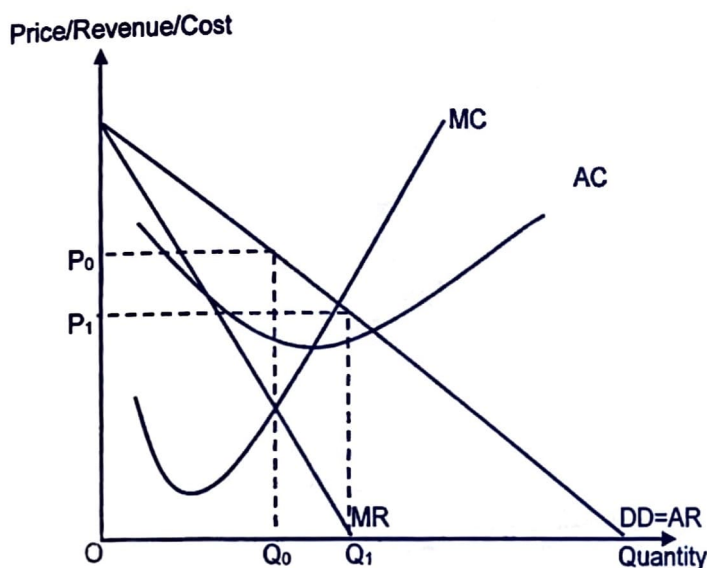
6.1 Pricing Strategies

Price strategies refer to the firm's plan for setting the price of its product given the market conditions it faces and its desire to achieve a specific aim or objective, for example, maximize its profits.

Unlike the PC firm which is a price taker, the firm in imperfect market structures is a price setter and hence has control over its own price. By setting prices, the firm has to accept it will sell the quantity demanded which corresponds to the price as indicated by the firm's demand curve, in other words, it cannot set both price and quantity. The pricing strategy for firms with market power is complex. There are many pricing strategies that price setters can use, and they include uniform pricing, price discrimination, predatory pricing and limit pricing.

6.1.1 Uniform Pricing

Figure 15



Note: In all the previous analysis, we have assumed that firms practice uniform pricing.

Assuming that the firm in imperfect market structures charges the same price for the same good sold to all customers or sells all units of its output at the same price.

- To maximise its profits, a price setter will set its price at P_0 and output level Q_0 where $MR=MC$ (Figure 15).
- To maximise its TR, it will set its price at P_1 and output level at Q_1 where $MR=0$.
- To achieve its profit-satisficing objective, the firm may choose to price its product between P_0 and P_1 .

6.1.2 Price Discrimination

So far, we have assumed that the price-setting firm charges the same price for the same good sold to all customers or sells all units of its output at a single price. Under certain conditions, however, a price-setting firm with market power can practise price discrimination.

a) Definition of Price Discrimination

Price discrimination occurs when a producer sells the same good at different prices whereby the price difference does not reflect differences in the cost of supplying the customer.

The objective of price discrimination is to allow the price-setting firm such as a monopolist to capture consumer surplus and earn higher total revenue and in turn, ceteris paribus, higher total profits from the sale. If a firm with market power can price discriminate, it can earn more economic profits than a firm that charges a uniform price.

Think: Would you consider differences in prices from superficial differences in the products e.g. Windows Home vs Professional editions a case of price discrimination?

b) 3 Necessary Conditions for Price Discrimination

For firms to practice price discrimination, the following three conditions must be met:

i. The seller must have market power.

- The seller must have market power in order to have the ability to price discriminate because without market power, a firm cannot choose its price at all, much less choose to charge different prices to different consumers.

ii. The firm must be able to distinguish among buyers who would be willing to pay different prices or identify and segment the market into separate groups based on differences in price elasticity of demand (PED) for price discrimination to be profitable. In general, the individual or group with a relatively lower PED will be charged a higher price.

In which market structures would the firms be able to price discriminate?

- For example, train companies are able to practice price discrimination because they are able to segment the market for rail travel into the student group and adult group. They charge students a lower fare than adults as students have a higher price elasticity of demand than adults because fares as a proportion of their income or allowance is typically higher for students than for adults. The train company is able to identify and separate the students from the adults because students are required to produce their identification card upon request when they use their concessionary train tickets.
- Another example would be the early-bird discount strategy. In the low-cost airlines market, airline companies can segment the market by time. Customers booking early with carriers such as AirAsia are typically charged lower prices if they are prepared to commit themselves to a flight by booking early. Customers who book early are typically price-sensitive buyers who plan meticulously, including taking time and effort to shop and compare prices. When they plan ahead, it is more likely that substitutes in the form of other airlines/modes

of transport are available, which suggests that their PED is elastic. By giving them a discount the airlines hopes that there will be a more than proportionate increase in quantity demanded which would increase their total revenue and profits *cet. par.* In contrast, closer to the date and time of the scheduled flight, the price rises because customers who book later typically have a relatively less price elastic demand because the number of substitutes (seats and flights) available become fewer and these customers also have less time to search for substitutes.

iii. The firm must be able to prevent resale and arbitrage for price discrimination to work.

- To employ price discrimination as a strategy, the firm must be able to prevent its consumers from reselling its product among themselves. Otherwise, the customers who are able to buy the good at a low price could resell the good to other customers who would otherwise have had to buy the product from the firm at a higher price. The practice of buying the good at a lower price and then reselling it at a higher price is called arbitrage.
- The ability to engage in arbitrage makes all consumers better off because the low-price consumers can make a profit on resale, and the high-price consumers can buy the product at a lower price than what the firm charges. The firm, however, is not better off because eventually it can only sell to those who want to buy it at the lowest price. Hence, the firm would be back in the traditional situation whereby it charges a uniform price to all consumers instead of charging different prices to different consumers for the same good. For example, the train company is able to prevent resale by printing the student's name and other details on their concessionary train tickets.

c) Types of Price Discrimination

Price discrimination strategies include first-degree (perfect price-discrimination or personalized pricing), second-degree and third-degree price discrimination.

I. Third-degree Price Discrimination

Third-degree price discrimination is a pricing strategy whereby the firm charges a different price to different groups of customers buying the same product by segmenting the market based on identifiable characteristics of these groups and the PED is different between these groups.

To engage in third-degree price discrimination, the firm *must be able to directly identify specific groups of customers with different price sensitivities (PED) before purchase based on the identifiable attributes of those groups.* (The firm is *not* able to identify the demand of every individual customer.) Some common ways that firms can use to directly identify customer segments for the purposes of price discrimination include:

- By customer characteristics:
 - Segmenting can be based on age (e.g. senior citizen discounts at the movies), or whether the customer is a foreigner or a local resident, or whether the customer is a student. PED must be different between these groups.
 - For example, train companies are able to practice price discrimination because they are able to segment the market for rail travel into the student group and adult group. They charge students a lower fare than adults as students have a higher price

Note: First- and second-degree PD are not in the H2 syllabus. For first and second-degree price discrimination, please refer to Appendix 3.

elasticity of demand than adults because fares as a proportion of their income or allowance is typically higher for students than for adults. The train company is able to identify and separate the students from the adults because students are required to produce their identification card upon request when they use their concessionary train tickets.

- **By location:**

- Customers living in one area may have a hard time getting to another to take advantage of a lower price, or they might not even have knowledge of the prices in other locations. Sellers can take advantage of customers' lack of accessibility or lack of knowledge by charging different prices in different locations, depending on the price sensitivity (PED) of local demand.
- Using the example of train fares, in some countries, passengers who live in central areas are charged lower fares compared to those in the suburbs because there are more alternative transport options available in central areas.

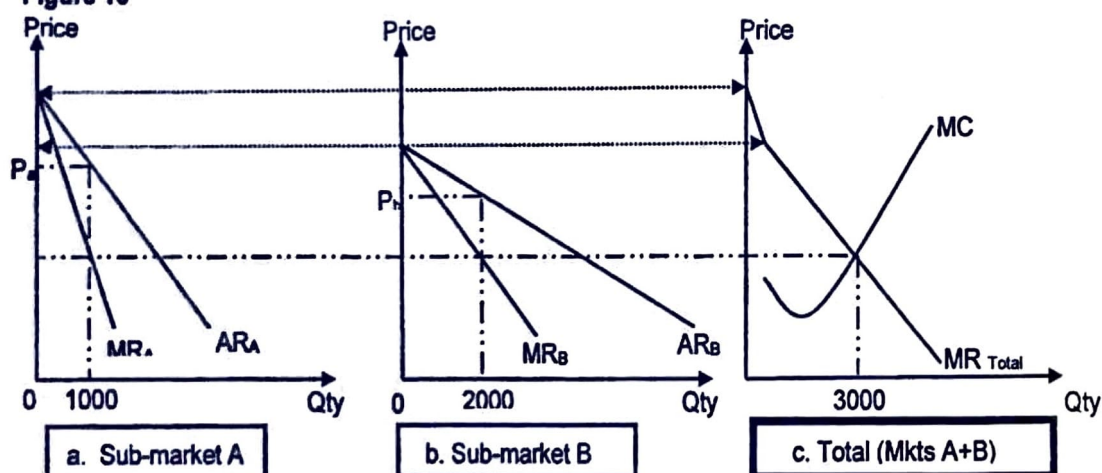
- **By past purchase behavior:**

- In some industries like the auto insurance industry, it is common for firms in these industries to give special discounts to *new* customers such as reduced premiums during the first policy period but charge *existing* customers the non-discounted rate because the existing customers tend to be relatively less price elastic in demand than new customers as they are not willing to spend time and effort in searching for better deals and/or because existing customers tend to assume that they already have the best deal.

What guides the firm's output and pricing decision?

- Total output must be such that for each group, $MR = MC$. If this were not the case, the firm could increase its profit by increasing or reducing total output.
- Total output should be divided between the two sub-markets so that MR for Group A = MR for group B. Otherwise, the firm would not be maximising profits. If MR for group 1 exceeds MR for group 2, the firm could clearly do better by shifting more output to group 1. It would do this by lowering the price for group 1 and raising the price for group 2.

Figure 16



Illustrations are only for understanding but not required:

- A firm practises price discrimination in 2 separate markets A and B, as shown in Figure 16.
- Panel c shows the MC and MR curves for the firm as a whole. The firm's overall MR curve (MR_{Total}) is the horizontal summation of the MR curves in the two sub-markets.
- Since MC must equate ($MR_A + MR_B$), drawing a horizontal line from panel c leftwards will allow us to determine the respective quantities in each sub-market. For a total output of 3000 units, 1000 units are sold in Market A and 2000 units in Market B.
- Total profit is maximised at a total output of 3000 units. This output must then be divided between the two sub-markets such that:
 - i. $MC = MR$ in each market
 - ii. MR in market A = MR in market B
- Thus, in sub-market A, 1000 units will be sold at a higher price P_A and 2000 units will be sold at a lower price P_B in sub-market B.
- The relative prices to be charged to each group of consumers will be based on differing price elasticities of demand.
- A higher price is charged in sub-market A – where demand is relatively less price-elastic and a lower price in sub-market B that has relatively more price-elastic demand.

Optional knowledge:
The market AR curve is disjointed where the MR is kinked in panel c. For a derivation of the market AR curve when the firm is practicing third degree price discrimination, please access the QR code below.



Key Point:
Higher P charged for mkt with relatively less price-elastic DD.

d) Benefits of Price Discrimination

The primary objective of engaging in price discrimination is maximize profits through revenue maximization and cost minimization.

- Allows firms to enjoy lower average cost of production by exploiting internal economies of scale. As charging different prices to different consumers according to their PED encourages new consumers to enter the market, it **increases the sales volume**. As a result, firms can benefit from lower unit cost of production as they are now able to **exploit internal economies of scale** from higher sales volume.
- Allows firms to produce in cases where **cost of providing a good or service cannot be covered by the low revenue generated**. It can happen in industries where firms incur high fixed costs associated with high infrastructure spending and maintenance such as gas, transport and electricity providers. Hence, by engaging in price discrimination, **firms can still continue to provide the good or service through cross subsidization** both within and between markets. For example, regardless of the low passenger traffic, a train has to run daily from London to Nottingham, incurring losses. However, with price discrimination, the rail service provider can still generate revenue on parts of the rail network service such as from London to Birmingham so that the operator can cover the losses on the least popular routes. Otherwise, the service between London to Nottingham may have to be withdrawn without price discrimination.
- Allows firms to **clear unsold inventories** when required instead of stocking them in the retail space or factory using price discrimination. As a result, these firms are better able to make better use of their shop or factory after clearing the excess stock. It also allows firms to **plan and hire staffs accordingly to manage customer flow into the retail stores**, minimizing cost of hiring staffs and

Refer to Section 7.4
for the effect of Price Discrimination on society.

maximizing profits.

e) Limitations of Price Discrimination

- Price discrimination is only effective if the firms are successful in segmenting the market and preventing resale. Price discrimination is effective in generating revenue to the extent that it can prevent resale. Hence, if the costs of preventing resale are significant, it will negatively affect profitability. For example, the secondary market (resale market) for concert tickets is very large and ticket scalping is widely common practice. A BTS concert ticket can be resold in the secondary market for more than \$12,000, revenue that is not earned by the concert organizer who failed to prevent the resale. As such, inability to prevent resale by scalpers could have detrimental effects on producers, as scalpers may be able to price discriminate more perfectly than the event organisers. Hence, event organisers need to spend on costly monitoring and enforcement systems to ensure that concertgoers are not able to resell their tickets in the secondary market, adding to the operational costs and negatively affecting their profitability.
- Although firms can leverage on technological advancement to prevent resale, it can also create opportunities for the resale market to grow. Technological advancement and the emergence of new ways of buying and selling a product online using apps, online auction, platforms to compare prices of a product. The "fan-to-fan marketplaces" such as StubHub and eBay can generate the price of a resale tickets almost immediately, suggesting that consumers have greater access to information that reduces the effectiveness of price discrimination. For example, minutes after the pre-sale tickets were made available for Ed Sheeran's concert to American Express members and to fan club, more than 4,000 of those tickets were posted for resale on StubHub.

Note: There are times price differentials can be a combination of cost differences and price discrimination. In such an instance, elements of price discrimination exist if the difference in costs does not fully account for the difference in price of goods.

Think:
Are you able to identify cases of price discrimination in the real world? Refer to more case studies in Appendix 4.

Some useful questions to ask to determine if it is a case of price discrimination:

Does the firm have the ability to price discriminate? Address these essential questions:

1	Does the firm have monopoly power?	Yes/No. This is because...
2	Can the firm prevent resale and arbitrage?	Yes/No. This is because...
3	Can the firm segment its market into individual customers or groups of customers with different PED?	Yes/No. This is because...

	Questions	Explain why and/or how.	Is it a case of PD for different prices charged?
1	Are they the same goods?	Yes/No. This is because...	Yes – Case of PD
2	Are there cost differences in providing the good to different groups of consumers?	Yes/No. This is because...	No – Case of PD Yes – Case of PD if cost difference does not justify price difference No – Not a case of PD if cost difference justifies price difference

6.1.3 Price Competition: Predatory pricing, Price wars, Limit pricing

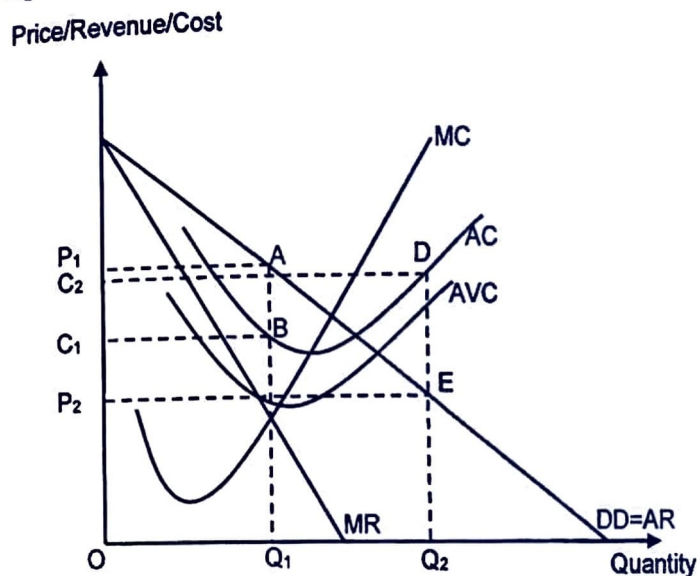
i. Predatory Pricing

Predatory pricing is a deliberate strategy of driving competitors out of the market and scaring off potential entrants by setting very low prices or selling below its average variable costs in the short run ($P < AVC$) (OECD/Tutor2u). Usually the dominant or incumbent firm in the market that behaves like a predator, setting prices very low to drive out competitors and deter entry of new firms known as the victims.

Assuming that both the dominant firm (predator) and its victims are equally efficient firms, engaging in predatory pricing will result in significant losses for both. Hence, for the predator to undertake this strategy, it expects the losses made in current period to be offset by future gains in the form of higher market power and profitability arising from lesser competition in the industry. In addition, the dominant firm may also enjoy improvement in its reputation by deterring entry of new firms or driving out rivals by demonstrating strong commitment to reduce competition.

By committing to cutting prices below its AVC to drive out competitors, the dominant firm will be seen as a credible threat to the rivals as they know that any response will be met by sharp price cuts. This will deter rivals from taking any aggressive actions against the predator. As such, the initial episode of predatory pricing will help to multiply the gains from the various spillover effects for the predator. Hence, the improvement in the firm's reputation will help the predator to retain its market share and continue to enjoy supernormal profits in the future.

Figure 17a: Predatory Pricing



P_1 and Q_1 are the profit-maximising price and output levels respectively. P_2 and Q_2 are the predatory price and output levels respectively, and the firm makes a loss equal to area C_2DEP_2 at P_2 , but this might force one or more competitors to leave the market if the competitor(s) cannot match the price reduction over the long run. Once existing firms have been driven out and entry of new firms deterred, the remaining incumbent firm can raise price to profit-maximisation levels because of the higher market power and demand it will enjoy.

However, for the predator to undertake such a strategy, it must have sufficient past supernormal profits or cross-subsidisation option from the other markets or product

to cover the losses in the present time in order to be seen as credible enough to follow through with the threat of cutting prices. Some firms may even invest on expanding plant capacity to demonstrate its commitment to fighting the rivals. The strategic move by the firm signals to the rivals that the firm has additional excess capacity to cut prices down further.

Furthermore, predatory pricing can only be used as a short-term strategy and unsustainable in the long run. A predatory pricing may trigger a price war that may lead to suboptimal outcome for all firms in the industry. In addition, when a firm uses predatory pricing, it may hurt the brand image of the firm as it may cause consumers to perceive the product as cheap or poor quality. Such low prices tend to attract only bargain hunters or those with weak customer loyalty, and does very little to establish customer loyalty in the long run.

ii. Price Wars

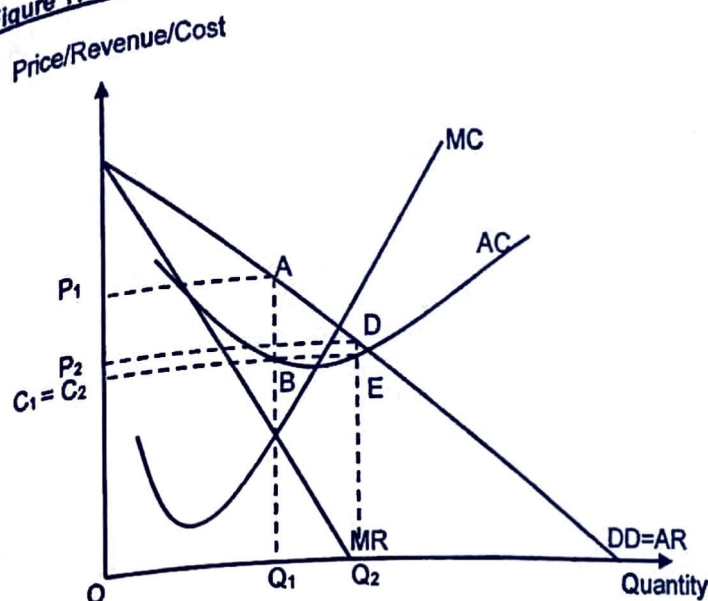
A price war is a situation whereby suppliers attempt to undercut one another's prices in an attempt to achieve a greater share of the market. This arises when there is excess capacity in the industry. As such, price wars are likely to be initiated by firms with the largest minimum efficient scale (Oligopolies). When a firm initiates a price war, it expects the rivals to drop their prices as well. On the other hand, in predatory pricing, the predator aims to deter entry and drive out rivals, conjecturing that the victims will be unable to match the low prices offered by the predator and exit the market. However, in price wars, the issue is about who emerges as the winner and is not simply about offering low prices. The price-cutting is part of a strategic plan by the firm and the goal is not to cede their consumers to their competitors. For example, price wars are common between Amazon and Walmart, where they wage online price war across all product types, including books, electronics and toys. This is also common in markets for low-cost airline and supermarkets.

However, price wars are harmful and unsustainable in the long run. Undercutting rivals is unsustainable as firms need to make at least normal profit in the long run to survive in the industry. If persisted for a long time, price wars may force firms to charge a price below the average cost of production, resulting in subnormal profits and forcing them to exit the industry. Price cuts does not necessarily lead to higher revenues for firms and depends heavily on the reactions of the rivals in response to the price cut of the firm that initiated the price war. For example, in a grocery price war with Tesco and Morrisons, Asda's profits declined significantly. Furthermore, lower profit margin also reduces the ability of firms to spend on expansion and R&D that can potentially bolster future profitability.

iii. Limit Pricing

Limit pricing is a pricing strategy used by the incumbent firm(s) to deter entry of new firms by setting a price below the profit maximizing price but above the competitive level. Incumbent firms can engage in limit pricing as they are able to draw on past profits to survive. Furthermore, these incumbents also enjoy significantly lower average cost of production compared to the new entrant who are not able to fully exploit the internal economies of scale upon entering.

Figure 17b: Limit Pricing



Limit pricing is a short run departure from profit-maximisation. In other words, the firm is willing to sacrifice profits in the short run to prevent entry. In Figure 17b, when the firm decides to sacrifice some short-term profits by pricing lower at P_2 and sell a higher output at Q_2 , it increases its market share. Total profit at Q_2 is, however, lower than at Q_1 . At P_2 , the entrant's unit cost of production is also likely to be higher than the price offered by the incumbent since it will start on a smaller scale of production and is unable to exploit any internal economies of scale. As a result, potential entrants may decide that the risks of entering the industry are too high. This is because they may make a sizeable loss and might not have the resources to sustain those losses until they can reach a competitive level of average cost through scale economies.

However, a large and established firm may be willing to enter a new product market for the purpose of diversification even if it is unprofitable in the short run. These firms may not fully be able to exploit internal economies of scale because of the low customer base it has. Nonetheless, they are still able to enter a new product market because they are able to cross subsidise and absorb the losses using the profits generated in other markets. For example, Google entered the market for mobile phones – despite no experience and successfully launched its Google Pixel phones. Similarly, Amazon launched its Amazon Fire Tablet despite the presence of key industry players such as Apple and Samsung. Hence, the strategy is ineffective if the potential entrants have the capacity to absorb the losses and likely to be more effective in industries with high sunk costs (exist costs) such as in the transport services, telecommunication services, and airline manufacturing industry. In these industries, the incumbents have first mover advantage and may successfully be able to prevent entry of new firms to retain their market share.

Refer to Section 6.3
on Growth Strategies
– Diversification for
more details.

6.2 Non-Price Strategies

Non-price strategies include non-price competition which is a marketing strategy that involves creating differences in a firm's brand and quality of products, rather than lowering prices.

Depending on the market structure, these strategies may be executed differently.

6.2.1 Marketing

- **Advertisement**

Advertising helps customers in their decision making process as it **reduces their search cost** for the product they are looking for. In these circumstances, the advertisements are extremely useful and are a low cost way of bringing all the information necessary to facilitate a buy to the customer. However, advertising can also be persuasive in nature, intended to change consumers' behavior by acting as a nudge.

Nudging is the process of designing choices in ways that will appeal to the consumers so the whole process of making the decision is easier for them by tapping on their cognitive biases correctly. As a result, firms are able to **increase the demand** and **reduce the degree of substitutability** [shift AR and MR to the right & and make them steeper] for its products, and help it to **increase its revenue** by creating **perceived differences** through advertising. These differences inform, persuade and convince consumers to purchase the products.

In the case of advertisements, firms may **stress the specific qualities or characteristics** of their products over its rivals. This is common when firms use advertisements to create a **successful brand** by **tapping on individuals' saliency bias** – which refers to the tendency for people to focus on information that is more prominent and over other less prominent but equally relevant pieces of information. As consumers, we are less inclined to spend our money on products/brands that we do not notice and we always **remember the first impression** an advertisement makes on us instead of the number of times the ads run. If a specific quality or characteristic of a product is not striking, human brain tends to blend it into the background. Hence, firms use advertisements to create cognitive ease by using salience, making it simpler for consumers to process information and make decisions.

For example, when Apple promoted its smartwatch, Tim Cook decided to highlight that the product will "tap you out of your laziness" and remind "you to get up and move since sitting is the new cancer". They focused on the product functionality that would appeal to the consumers such as how it delivers breakthrough wellness and fitness capabilities. As such, even if there are other similar products in the market providing similar functionality, consumers will be more inclined to purchase Apple Watch as the differences in its fitness capabilities may not be perceptible to the naked eyes. Similarly, Google focused on the salient features that makes the Google's Pixel 4 unique compared to its rivals. The ads focused on the camera quality, the secure payment system with Google Pay, Google AI, etc. As such, by focusing on the most salient features of a product, firms can increase the demand and reduce the degree of substitutability of its products through advertising since human behavior is heavily influenced by the most compelling or unique aspect of a product.

Furthermore, a successful and consistent advertising creates brands that consumers aspire to own or shorten the search process for consumers looking for consistency of quality (brand loyalty). As a result, consumers will perceive the **cost of switching** to the rivals' products to be higher as the **strong branding creates a loyalty** that "locks in" existing customers. Hence, firms are able to effectively retain their consumer base and keep the demand for their products relatively more price inelastic to earn a stable stream of revenue.

- **Promotions**

Time bound promotions or limited time deals offered by supermarkets and fast food outlets like Tesco, NTUC Fair Price, and Mc Donald's are marketing strategies that **target consumers' aversion to loss**. Individuals are negatively affected when they are faced with the prospect of losing something permanently, including items on

Important:

Cognitive biases occurs when individuals depart from rational decision making to relying on non-economic factors such as past preferences, emotional drivers and deeply held beliefs to make their choices.

Firms should understand their consumers' cognitive biases such as salience bias, loss aversion and susceptibility to sunk cost fallacy to increase demand for their products and profits.

promotions or are available only for a limited time, as they feel they are missing on an opportunity. Consumers are more motivated by the prospects of losses than the promise of gains in the face of uncertainty. Hence, they will take decisions to avoid losses of any kind that they value more than any form of gains because of their aversion to loss. Hence, to avoid the perceived losses by not participating in such promotional events and mitigate the negative emotions, it leads to consumers buying items that they do not necessarily want or need to consume more than once; example the Prosperity Burger and McGriddles. Such promotional events increase the demand and hence their revenue by targeting consumers' aversion to loss.

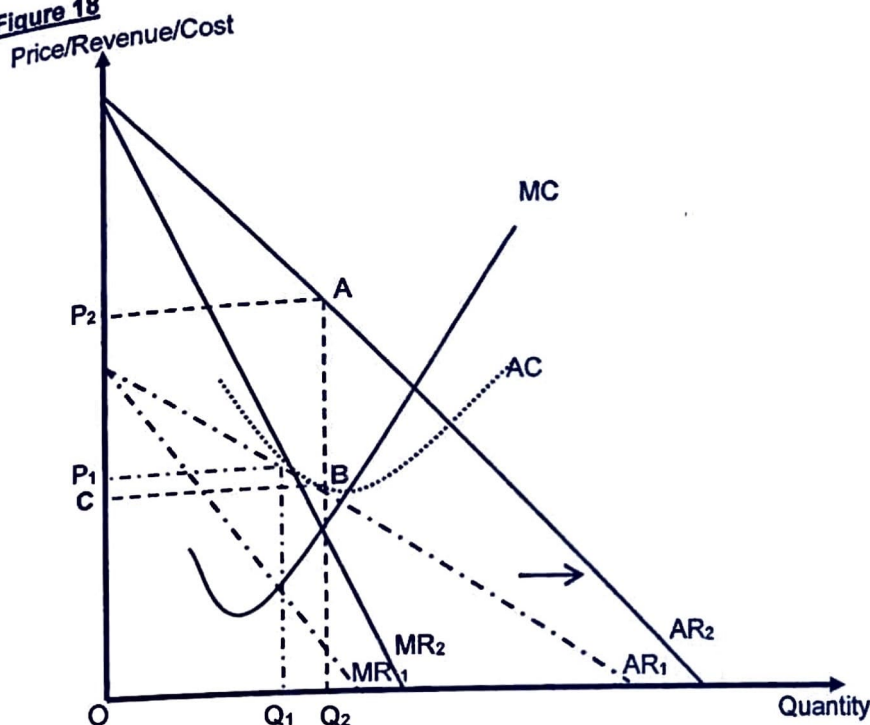
Similarly, production houses such as DC Comics, Paramount Pictures Studio and Warner Bros are able to generate a high demand for their movies by releasing new installments of big hits through the "sequels and prequels" by targeting the moviegoers' aversion to loss that leads them into the sunk cost fallacy. Consumers will always watch the latest movie sequel such as Spider-Man: No way Home and Harry Potter and the Deathly Hallows – Part 2 just because they have watched the previous installments of these titles. However, they realise that these movies are not as good as the first film and yet they still pay to watch the sequel and sit through the entire show just because they have invested time and money to watch the previous installments.

Sunk costs are costs that can never be recovered and the fallacy makes one "finish the meal" even when they are already full.

More information on sunk cost fallacy and loss aversion:



Figure 18



Referring to Figure 18, if firms are successful in using advertising and promotions to target consumers' cognitive biases, it will increase the demand and makes it relatively price inelastic by reducing the degree of substitutability of their products, shifting the AR curve from AR_1 to AR_2 . Correspondingly, this also shifts the MR curve from MR_1 to MR_2 . The firm profit maximizes where $MC=MR$. This means the new profit maximizing price and output is now OP_2 and OQ_2 , instead of OP_1 and OQ_1 previously. This increases profits for the firm – where previously normal profits were earned, the firm is now earning supernormal profits of area P_2ABC .

Monopolistic Competition (MPC): MPC firms do not earn supernormal profits in the long run due to the absence of barriers to entry. Thus, advertising and promotion for the MPC firm is usually smaller in scale. This might entail distribution of flyers and brochures or having banners or signs near stores, train or bus stations to direct customers to their stores. MPC firms may also change or refresh the packaging of their product so that it appeals better to consumers.

This will be discussed in greater detail under the section on performance of firms.

Oligopoly and Monopoly: Advertising is an important feature of an oligopolistic and monopolistic market structure. In oligopolistic markets, there are few key competitors. Advertisement helps the customers in their decision making process when there are not many products to choose from or the consumers have little time to search thoroughly on the limited options they have before making a decision. In these circumstances, the advertisements are extremely useful and are a low cost way of bringing all the information necessary to facilitate a buy to the customer. Therefore, it is beneficial for the customer when they do not have to put in any effort on their part to obtain the right information. Since oligopolists and monopolists are able to earn supernormal profits in the long run due to the presence of barriers to entry, this means they have substantial funds to do larger scale advertising campaigns. This might include TV advertising, social media advertising and advertising in the print media (magazines, newspapers etc). They can also run joint advertising campaigns, marketing their goods or service jointly with other related firms (e.g. credit cards).

However, advertising is costly and may result in wastage of resources. If the cost of advertising exceeds the revenue generated, the firms will see an overall fall in profits. Moreover, the result of advertising can only be materialized in the long run as it takes time to change consumers' taste and preference and hence choices. As such, it defers revenue generation. Furthermore, advertisements may not be successful if firms tend to focus heavily on the more prominent aspects of their brand and products since salience can be a double-edged sword. Excessive advertising of the salient features of a product may backfire and generate negative feedback from the consumers as they may not find it useful at times, resulting in weak demand for the firm's product. Similarly, firms may continue to spend heavily on advertising and promotions since they have already committed to launching the product. Even if there is no material gain in demand and revenue for the products, firms fall victim to the sunk cost fallacy. This leads to only rising costs.

6.2.2 Product Differentiation

Production differentiation can take the form of real differentiation when physical changes to the product itself is made by adding more features to the existing products and making it different from the products provided by the rivals (quality, taste). On the other hand, imaginary differentiation can take the form of repackaging and branding (as explained in the previous section). Lastly, unrelated to the product/cost conditions – service differentiation.

When firms differentiate their products, they are likely to keep in mind the most salient features of their products to target the salience bias of customers to increase the demand and hence their revenue. Brands like Apple, Netflix and Starbucks use salience to shape their customers' decision. For example, Apple keeps their products clean and simple to avoid confusing their customers with different options and information. They focus on simple design to get 100% of the consumers' attention. We always associate the white minimal design and a "bitten" apple with Apple products. Similarly, consumers enjoy Netflix because of not only their huge content variety but also the way viewers can navigate the content into seamless experience. Netflix has managed to establish itself through the most salient feature, the content personalization algorithm and its opening sound "ta-dum".

By targeting consumers' saliency bias, firms like Apple and Netflix have continued to dominate in their respective product markets. Netflix has seen an increase in more than 8 million subscribers during the pandemic, increasing demand for its product and hence revenue by tapping on consumers' saliency bias using product differentiation.

Product differentiation also increases the opportunity cost of switching by lowering the degree of substitutability of products sold by firms. It can also deepen the degree of brand loyalty by consumers by convincing consumers that the product is different from those offered by the rivals. Furthermore, service differentiation concentrated on strengthening the relationships with customers who make regular purchases has an effect of "keeping customers from defecting". For example, firms like Tesco and NTUC Fair Price use the loyalty schemes such as Tesco's Club Card and NTUC rewards to create loyalty and lock in their customers with the reward programs. This is effective in increasing customers' perceptions of switching cost, thus fostering customer retention and switching may involve forgoing points, expending effort and time in signing up for a new program, and learning how to redeem rewards.

As a result, firms can increase switching barriers by offering attractive loyalty programs that acts as a "barrier to entry" to other firms as customers may be unwilling to switch to the alternative providers such as Giant or Waitrose. This is because consumers are more motivated by the prospects of loss in the forms of points accumulated, familiarity, convenience and customer-firm relationship against the promise of gains of better quality and cheaper products due to their aversion to loss.

As such, consumers continue to patronize firms like Tesco and NTUC because they focus on the amount of points they have already accumulated as they are influenced by the sunk cost fallacy. Such fallacies prevent consumers from making choices that are likely to maximize their present utility and not which negates the feeling of loss due to decisions made in the past. Such cognitive biases thus enable firms to employ strategies to increase demand for their products and hence revenue.

However, it can be challenging for firms to differentiate their products to ensure that the demand for their product is price inelastic. Once a firm reveals a new idea or include a unique feature in its device, other manufacturers can also include similar features into their devices. Thus, even if a firm can differentiate its products or services, the uniqueness of its product may only be in the short run. This implies that firms have to constantly innovate and differentiate their products, either by including unique features or by differentiating their services to retain customers. The above strategies can also be expensive, therefore, increasing the total costs incurred by firms.

6.2.3 Research and Development Leading to Product Innovation

Research and development (R&D) includes activities that companies undertake to innovate and introduce new products and services. Product innovation involves researching the market and the needs of customers and developing new products (such as Fitbit or Amazon's Kindle) and improved products and services (such as an improvement in the digital camera resolution of the iPhone 13) to meet these needs. This may allow the firm to capture a larger share of the market and in turn increase its total revenue and ceteris paribus, increase its profits, since it may be some time before competitors can respond with a similarly improved product. The industrial, technological, health care, and pharmaceutical sectors typically incur the highest degree of R&D expenses. For instance, the success of major drug companies is almost wholly dependent upon the discovery and development of new medicines.

Monopolistic Competition (MPC): In a monopolistic competitive market structure, there is a *limited degree and pace of innovation due to the lack of financial resources* as well as inability to retain the supernormal profits from the innovation because of the low

Diagrammatically, product and service differentiation can lead to a rightward shift of the AR and MR curves.

Spending more money on these strategies also leads to an upward shift of the firm's average fixed cost and average total cost curves.

Diagrammatically, product innovation can lead to a rightward shift of the AR and MR curves.

Spending more money on R&D also leads to an upward shift of the firm's average fixed cost and average total cost curves.

barriers to entry.

Oligopoly: The degree and pace of innovation is greater since oligopolies have financial resources to conduct research that lowers unit cost of production and creates new/better quality products. The high barriers to entry also allows them to retain the supernormal profits from the innovation.

Hence, the motivation is strongest in oligopoly than monopolistic competitive and monopoly. For example, introduction of new products into the market through product innovation/R&D – Amazon tablet. No other company has made any material progress against Apple's iPad but Amazon has managed to offer a very compelling product for the lower-end of the market.

However, the above strategies can be expensive, therefore, increasing the total costs incurred by firms. Many firms are susceptible to the sunk cost fallacy when making decisions whether to continue investing in the R&D. Financial resources spent on engaging in developing a new product is irrecoverable and may cost a firm greater financial losses when the results of the R&D is uncertain and takes a long time to generate revenue. For example, when pharmaceutical companies like Pfizer invest almost \$1 billion on developing antifungal and antibacterial medicines, they are likely to continue with more research until they can bring the medicines into the market successfully and earn the revenue they forecasted. If the R&D is unsuccessful, a rational firm is likely to weigh the marginal cost and marginal revenue in its decision whether to continue with the R&D. However, some firms that engage in R&D like Pfizer are likely to continue to invest more financial resources on developing the product that may not generate any revenue but lead to higher costs because their decisions are largely influenced by the sunk cost fallacy.

6.2.4 Cost-reducing strategies

Cost-reducing strategies can include the following:

- A firm can reduce its variable costs by sourcing for cheaper inputs. The fall in its variable costs will lead to a fall in both its AC and MC. Ceteris paribus, its profit maximising price will fall, its profit-maximising output level will increase, and its total profits will increase.
- A firm increasing its scale of production can more fully exploit available internal economies of scale (Refer to Section 2.4.3 of Part 1 and Section 6.3 on Growth Strategies).
- Firms can band together or set up jointly owned enterprises to source for raw materials, allowing them to obtain many of the internal economies of scale enjoyed by larger firms.
- Businesses in the same industry tend to cluster in together so that they can enjoy economies of concentration which is a type of external economies of scale (Refer to Section 2.4.4 of Part 1)
- R&D can also include activities to develop existing and new business processes known as process innovation – include changes in the equipment and technology used in manufacturing (including the software used in product design and development), improvement in the tools, techniques, and software solutions used to help in supply chain and delivery system, changes in the tools used to sell and maintain your good, as well as methods used for accounting and customer service. Firms can automate certain aspect of production processes as well reduce the use of office space to run their business operations to reduce the average and

Diagrammatically, a fall in fixed cost is reflected by a downward shift of the AC curve. MC curve does not shift as MC is a variable cost concept.

marginal cost of providing a service or a good, reflected by a downward shift of average and marginal cost. For example, pharmaceutical and medical device manufacturers have turned to automation to cut costs, mainly because robots are able to complete repetitive tasks up to 50% faster than current manual processes, enhances productivity and enabling highly skilled manufacturing, medical and laboratory staff to undertake more valuable activities.

However, automation can be costly and hurt demand for goods and services that thrives on buyer-seller relationship, particularly in the banking sector. Production and maintenance of artificial intelligence and robotic automation can lead to huge costs since they are very complex machines. Artificial Intelligence also consists of advanced software programs that require regular updates to meet the needs of the changing environment. In the case of critical failures, the procedure to reinstate the system and recover lost codes may require enormous time and cost. Personal data of customers may be compromised and affect the demand for the banking services. As such, the above strategies may not necessarily be effective in cutting costs and hence profits.

- **Offshoring/outsourcing various stages of production to a country that can produce that respective stage for the lowest cost** also allows firms to lower their average costs, or at least mitigate the rise in costs possibly due to rising costs of research and development, rentals and advertisement. For example, firms can offshore their customer support to countries like China and India to cut cost on labour costs where wages are significantly high. Similarly, American firms like CISCO, Ford and American Express have offshored customer support, back-office, technical support services, and have shifted their call center operations, and other business processes to India.

However, there will be difficulties in controlling the quality of services that end up adversely affecting the demand for a firm's product. For example, manufacturing offshoring may not guarantee that a product is strictly built according to the parent company's standards and may affect quality of the finished product. Additionally, services may be of poor quality due to communication barriers between American consumers and those providing the services at the call centers in India. Outsourcing can also increase risks associated with data sensitivity and loss of confidentiality to external parties. As such, the reduction in costs may be insufficient/ minimal and ineffective in raising profitability. Furthermore, if the poor quality of the product and services affects the demand, profits may fall further if the total revenue falls more than the potential cost reductions.

6.3 Growth Strategies

Firms grow by producing more of its existing product or extending the range of its products it sells. There are two types of growth. **Internal growth** occurs when the firm grows within the framework of its existing management and control structure. **External growth**, on the other hand, occurs through mergers and acquisitions. A merger occurs when a firm combines with one or more existing firms to form an entirely new enterprise or by buying over another firm. To obtain funds for growth, firms can (i) reinvest profits (ii) borrow from banks (iii) initiate an Initial Public Offering (IPO) on the stock exchange.

6.3.1 Mergers and Acquisitions

Mergers and acquisitions include horizontal integration, vertical integration and conglomeration.

Horizontal Integration

Horizontal integration occurs when a firm combines with or takes over a similar firm at the same stage of production to form a single entity. For example, merging of different car companies, airlines or banks. The motive for horizontal integration could be to lower its long run unit costs of production as it expands its scale of production towards its minimum efficient scale. This is because when the number of firms producing the same product merges to form a larger firm, the joint production capacity might allow the "new" firm to be able to more fully exploit available internal economies of scale such as technical, managerial, financial and research and development economies of scale. (see Firms and Decisions I for detailed explanations).

The motive for horizontal integration could also be market share dominance. This is because when the number of firms producing the same product merges to form a larger firm, there is clearly a reduction in competition and hence, it will enjoy an increase in demand which increases its market share. It will also increase its market power which makes its demand less price elastic, hence increasing its ability to raise price over its marginal costs of production. *Ceteris paribus*, this will lead to an increase in its total revenue and in turn its profits.

Vertical Integration

Vertical integration, on the other hand, occurs when a firm combines with or takes over another firm at a different stage of production but in the same industry. In other words, the company controls more than one stage of the supply chain. This is a form of diversification that allows firms to achieve new sources of revenue and allows it to spread its risks as losses incurred for one product can be offset by profits earned from another. As such, through vertical integration, firms are able to secure access to retail markets or production inputs, enabling it to further benefit from reduced risks, increases sources of revenue, and greater economies of scope.

- **Forward integration** occurs where a firm moves into succeeding stages of production and gains ownership over other companies that were once customers. Examples include breweries buying up pubs, iron miners that own "downstream" activities such as steel factories. A clothing manufacturer that opens its own retail locations to sell product is also an example of forward integration.

The main objective of forward integration is to lower uncertainty with regards to access to markets, hence improving supply chain coordination. Forward integration enables the firm to have more control over the way the product is presented and distributed, and at what prices it is sold in the market. Control is crucial for companies that operate in industries that lack qualified distributors which can adversely affect the demand for its product and in turn its revenue and profits. Or in situations where distributors charge significant costs, forward integration will remove the cost paid to distributors and thus lead to higher profits. The control over distribution channels ensures the strategic independence of a company from third parties.

- Vertical integration may allow a company to set itself apart from its competitors. For example, a company that manufactures electronics could establish itself as a retailer, providing an experience for its customers that its competitors cannot.

For example, when Apple opened its first retail store in 2001, it was able to cater to customers in a way that Microsoft could not. Similarly, AT&T currently uses OneWeb's low Earth orbit satellites to extend high-speed broadband services to areas outside its fiber footprint in the US. *Such mergers have helped to increase the demand for the firms' products and in turn its revenue and profits.*

The most obvious route so far is diversifying away from the traditional product space and venturing into new markets can offset some of the loss in revenue

from traditional product space by creating new revenue stream as they face a rise in the level of competition, and to a larger degree, in certain product space.

Vertical integration also results in lower costs. The types of costs that can be reduced or removed in a forward vertical integration include transportation costs, transaction costs, and business-to-business marketing costs. By removing distributors, in other words, cutting out the middlemen that would typically be paid to sell a company's products, costs will be lowered, and overall profitability improved.

- **Backward integration** occurs where one firm merges with another firm involved in the previous/earlier stage of production, that is, business at the end of the supply chain takes on activities "upstream". This means that the firm tries to increase ownership over companies that were once its suppliers. For example, oil refineries buying up oil wells. Another example is Amazon, which expanded from an online retailer of books to become a publisher with its Kindle platform. Amazon also owns warehouses and parts of its distribution channel.

The main objective is to lower uncertainty with regards to securing factors of production and hence, improve supply chain coordination. This means that the firm is able to gain greater control over the quantity and quality of scarce factors of production. Having greater control over the quality of raw materials is important because it determines the final product's quality and in turn its demand and revenue. In the early days of the automobile business, Ford Motor Company created subsidiaries that provided key inputs to vehicles such as rubber, glass, and metal. This approach ensured that Ford would not be hurt by suppliers providing materials of inferior quality which can lead to a fall in demand and in turn its revenue and profits, or by suppliers holding out for higher prices which can lead to higher costs of product and in turn a fall in its profits.

Backward integration may also have the aim of **entry deterrence**, restricting the availability of supplies of critical factors of production to a potential competitor. For instance, a retailer might buy a manufacturing company, for instance, to gain access to proprietary technology, patents or resources only available in the firm's local area. Keeping potential rivals out of the market helps to prevent the demand for its product and in turn its revenue and profits from falling.

By producing the factor input directly, a retailer can experience a reduction in its costs and in turn its profits. This is because suppliers will sell their products to retailers at profit maximizing price. However, if a retailer can circumvent suppliers such as these, it is able to acquire these factors of production at cost price and therefore reduce overall costs. This is especially important if its suppliers have a lot of market power and can push up the prices of its factors of production above its MC. Backward integration can also prevent slowdown in production caused by negotiations or other aspects external to the company. Ceteris paribus, its profits will increase.

However, mergers and acquisitions can result in diseconomies of scale if the merged entity becomes too large. Management decisions may become more complex and time-inconsistent. The merged firm may become less responsive to changes in market conditions since decision-making has to go through several channels before a final decision is made. The merged firm will also find it more difficult to monitor workers and coordinate activities within a larger firm in comparison to a smaller firm as managers will find it challenging to motivate workers, increasing the monitoring cost as the firm may need to hire additional workers to do the task. As such, mergers and acquisition may result in higher average cost and adversely affect firms' profitability. Furthermore, the different companies may have different work culture and objective, resulting in failed mergers and rising average cost.

For example, the vertical integration between Amazon-Whole Foods resulted in losses as the two companies had different set of values when running the firm. Amazon leverages on technology to run its business model and is highly impersonal. Meanwhile, Whole Foods is driven by personalised services. Such differences in values led to suboptimal outcome from the merger. Similarly, merger between Hewlett-Packard and Compaq also failed despite having highly reputable products. Again, the revenue from the merged entity fell drastically because of the differences in the way the companies were run.

Diversification / Conglomeration

A conglomerate is one very large firm but it consists of many smaller firms that is formed through either mergers or acquisitions. The newly formed conglomerate, known as the parent company, sells a variety of goods and services that are not directly related to one another through its subsidiaries. Successful conglomerates include Meta (subsidiaries include WhatsApp, Instagram, Facebook, PrivateCore, Oculus etc.), Alphabet (Intrinsic, Google, DeepMind and etc) and Johnson & Johnson (Janssen Pharmaceuticals, Aveeno, LifeScan and etc). Amazon is the most prominent 21st century conglomerate and was formed through mergers and acquisitions over many years. It has multiple subsidiaries including Amazon Web Services (cloud computing), Zoox (autonomous vehicles), Kuiper Systems (satellite Internet), Amazon Lab126 (computer hardware R&D). The subsidiaries may run independently of one another but reports to the parent company about their business activities.

One of the main reason for the formation of conglomerates is diversification which helps to reduce uncertainty and risks (e.g. due to a recession, which decreases demand for certain products significantly). For example, if a farmer produces a whole range of vegetable products, or even diversifies into livestock, then they are less subject to adverse weather conditions and the unpredictability of the specific market. Insurance companies also diversify to deal with uncertainty. When an insurance company offers more types of insurance (e.g. car, house, life, health insurance and so on), this would reduce the risk of having significant payout costs and in turn, decreases in profits due to a single event.

However, conglomerates may face rising average cost due to the added layers of management and corporate culture issues similar to those faced by a merged entity. Furthermore, the parent company may not have the necessary skills and expertise to support the newly acquired subsidiaries. In other words, the parent company may lack the tools to comprehend the business functionalities of its subsidiaries due to lack of transparency and moral hazard issues associated with the large size of the conglomerate. Although diversification through the formation of a conglomerate is expected to reduce uncertainty and risks in times of business cycle fluctuations to remain profitable, it may not necessarily be true. A conglomerate may continue to hold on to its poor performing subsidiaries for the purpose of diversification. These unprofitable subsidiaries may hurt the performance of its more profitable subsidiaries. As a result, a conglomerate may fail as averages costs continues to increase and average revenues decline, negatively affecting overall profitability of the conglomerate.

6.3.2 Franchising

Franchising is one way for firms to grow internally. Franchising is the practice of selling the right to use a firm's successful business model and brand for a prescribed period of time. By having many franchisees, the firm can quickly expand or build "chain stores", while avoiding the risk of investing significant amounts of capital. By proliferating its brand, the firm can also quickly build brand presence, reducing search costs for consumers and increasing the revenue by collecting fees from franchisees. The firm is also able to reap marketing economies, spreading significant

advertising cost across the many franchisees, and bargaining for lower prices for its factor inputs. One good example of a franchise business is McDonalds, which has over 15,000 restaurants. Each franchisee license is valid for 20 years and renewable after that.

However, one of the main challenges facing a franchise like McDonald's is that if the franchisee does not maintain the standard of quality and service, there is a likelihood that it will negatively impact the reputation of the franchise. Communication with franchisees located globally may become costly for the franchiser as well the high cost of training. The franchisees also face challenges because they may lack the freedom to operate independently as they have to adhere to the instructions and communications provided by the franchiser even if some of the policies may be unsuitable in certain locations because of cultural differences. Furthermore, the franchisees may not be profitable, as they have to make payment of royalties that are significantly high even in times of low demand and revenue. In recent years, the franchise sector has become increasingly crowded marketplace and facing financial distress.

6.4 Alternative Models on Pricing

The profit-maximising model assumes that all firms have perfect information about their own costs and revenue, including their own marginal costs and marginal revenue. It is asserted that the real-world firms do not bother about the calculation of marginal revenue and marginal cost. They may not know the demand and marginal revenue curves faced by them nor possess adequate information about their cost structure.

Alternative pricing models include mark-up pricing and full cost-plus pricing.

• Mark-up Pricing

Mark-up pricing (otherwise known as cost-plus pricing) is widely used in retailing, where the retailer wants to know with some certainty what the gross profit margin of each sale will be. For instance, in the UK, a standard retail mark-up is 2.4 times the cost the retailer pays to its supplier. Hence, if the firm wishes to ensure that it makes 2.4 times its unit cost of production, then if the cost of supplying the product is 10 pounds, the retailer will look to sell it for 24 pounds. This is equal to a total mark-up of 14 pounds (that is, the selling price of 24 pounds less the wholesale cost of 10 pounds).

What types of costs will be considered by the firm? Under full cost plus pricing, the firm seeks to set a price that takes into account all relevant costs of production, including fixed costs and variable costs and mark it up by a certain number of times the costs of production.

An advantage of the above approaches is that the business will know that all its costs are being covered.

6.5 Technological Disruptions

Disruptive technology is an innovation that considerably changes the way buyers and sellers communicate, conduct transactions and firms operate. A disruptive innovation replaces well-established systems, products or even habits because it has attributes that are far superior. *Social media, mobile, wearables, Internet of Things, real-time* — are some of the technologies that are disrupting markets. Professor Clayton M. Christensen, at the Harvard Business School, first coined the term "disruptive technology" in his paper in 1995. Recent disruptive technology examples include *blockchain, e-commerce, and ride-sharing apps*.

Alternative models on pricing are useful as an evaluation point. In H2 Economics, the basic analysis for how a firm sets its price and output level is at profit maximising level where $MR=MC$.

More information on disruptive technologies.



In the face of disruptive technology, firms are undergoing digital transformation and leverage digital technologies to adapt and innovate, trying out new ways of delivering services. Such transformation focuses mainly on customer behaviour and is not simply about technology, as it seeks to improve customer experiences and customer-firm relationship.

6.5.1 Technological Disruption and its Impact on Profitability

Disruptive technology spurs new demand and encourages the creation of new products. Disruptive technologies also led to the emergence of a larger number of innovation and technological startups. One prominent example would be of the Singapore-based ecommerce site Lazada. Among a rising trend of online retail startups, Lazada is leading the Southeast Asian market with more than SGD\$1 billion yearly revenue, whereby mobile terminals accounts for more than 60% of its transactions. As the COVID-19 pandemic reshaped consumer behavior, online retailing saw a sudden boom fueled by national lockdowns and increasing number of consumers avoiding physical stores.

Diagrammatically, disruptive technologies causes a downward shift of AC curve, MC curves & AR and MR curves.

An acceleration in adoption of disruptive technologies, primarily in emerging countries, can be driven by economic shocks such as the Covid-19. With such ease of browsing for goods and services at one's fingertips, use of disruptive technology can help firms to increase demand for their goods and services, increasing total revenue and hence profits. Hence, consumers who have been exposed to online group buying of agricultural products, foods, online price comparison platforms, ride-hailing and bike sharing services, are expected to increase their demand further. Furthermore, disruptive technologies enables firms to differentiate their products and services significantly, reducing the degree of substitutability of their products to that provided by the rivals, hence increasing market their power and limiting competition.

For example, e-commerce platforms such as Shopee, Lazada and Amazon that have a large numbers of users have expanded into e-payments, while online mobility platforms have expanded into online delivery. Such opportunities will allow these incumbents to acquire start-ups at the early stages, potentially limiting competition. Moreover, Big Data analytics play a key role in helping firms optimise revenue strategies in a changing and diverse global economy. Firms can use Big Data analysis to better cater to the diverse cultural preferences and sensitivities to capitalise on the rapidly growing consumer market.

Firms can also digitize their operations to cut costs and use information and communication technologies to enable remote work, supply chain management, and an online relationship with clients (World Bank, 2020). Application of disruptive technologies increase competitiveness of existing industries, like Radio frequency identification (RFID), and the rise of e-commerce can be greatly beneficial to firms in improving the efficiency of supply chains. Producers can tighten their supply chains to avoid accumulating inventories and minimise their losses.

6.5.2 Risks to Adoption of Disruptive Technologies

Despite the potential that disruptive technology provides firms, it has its challenges. With greater use of technologies to run business operations, the reliance of labour is likely to decline. Hence, with rising unemployment and loss of income, the demand for goods and services may also be adversely affected. Such loss in income may constraint further adoption of disruptive technologies by firms to remain profitable.

Barriers to digital connectivity remain a challenge in many developing and emerging countries, and it may slow the adoption of disruptive technologies. These barriers include availability of affordable quality internet access and the level of digital skills in the

majority of the population. Hence, the expected rise in overall demand and revenue globally may be overestimated as the digital divide may be significant across the globe. According to estimates by World Bank, around 3 billion people in emerging countries are still offline, and the digital divide could widen with the ongoing pandemic, potentially affecting the diffusion of disruptive technologies.

Furthermore, cybersecurity risks are likely to increase with the rise in the use of digital services as it also increases the exposure to cyberattacks. Recently, Amazon suffered a cyber-attack by hackers who syphoned funds from its merchant accounts. These accounts were compromised using phishing techniques. Other online frauds have also become common in the banking sector, where hackers deceived account holders into giving up sensitive information while controlling their computers remotely. In 2020, the OCBC bank lost a total of \$13.7 million in phishing frauds.

6.5.3 Disruptive Technologies and Competition & Contestability

Through disruptive technology, smaller firms that have fewer resources to enter and target segments of the market that have been neglected by the main industry players, allowing it to compete. Disruptive innovation also reduces exit costs significantly for potential entrant that no longer need to spend significantly on the set-up cost to sell their goods and services. For example, with the increase in demand for restaurant-quality meals delivered to one's home, there is an emergence of delivery only kitchens known as "cloud kitchens or ghost kitchens". These are food preparation operations with no waiters, no dining room and no parking lot. In other words, these kitchens have no physical presence at all. With minimal entry and exist costs, disruptive technologies have increased contestability in the F&B industry. Currently, there are about 7,500 cloud kitchens now operating in China and 3,500 in India.

Hence, disruptive technology removes barriers to entry and lowers entry cost into a market, weakening the position of established players and giving new firms space to grow. As a result, with the use of disruptive technology, markets are likely to become more competitive and to a certain degree contestable, reducing the market power and profitability of big firms such as Amazon and Lazada.

Meanwhile, firms that are slow to respond to disruptive technology or leverage on it are likely to be phased out over time. For example, Nokia invented its first smartphone in 1996 but failed to update its software to remain relevant by including apps and ignored the changes that followed. Similarly, Blackberry failed to respond to changing consumers' needs and wants. In 2017, it exited the market for smartphone. Traditional television distribution are also increasingly being driven out by digital distribution providers such as Netflix and Hulu with more people consumers opting for streaming services.

Conclusion

Having understood the objectives of firms, costs and revenue conditions and the nature of market structures, it is also important to recognise that with each decision made by the firm, there are always business risks and uncertainties associated with these decisions. For example, a change in government regulation such as that which aims to liberalise the market and remove barriers-to-entry, would mean great uncertainty for an existing firm with large market power. Its decision-making process needs to account for the uncertainty of the influx of rival firms. Business cycle volatility would also present firms with unpredictable challenges related to demand for their products. Firms would have to constantly engage in decision making processes and make changes to their business strategies.

Refer to Appendix 5
for the Case study of
the Banking and
Financial sector.

Sectional Summary:

- Firms undertake various strategies based on their objectives and constraints.
- Price discrimination is undertaken by firms with market power to increase their total revenue and profit.
- The strategies of firms also depend on the contestability of the market which is the next section.
- Besides describing the strategies, it is important to assess them.

7 ASSESSING PERFORMANCE ACROSS DIFFERENT MARKET STRUCTURES

7.1 Criteria for Assessing Performance/Desirability

The performance/desirability of a market structure is assessed in terms of the impact on:

- Economic (or static) efficiency, which includes both allocative efficiency and productive efficiency. Economists use the term market failure to describe firms that fail to attain economic efficiency.
- dynamic efficiency
- equity, and
- consumer choice

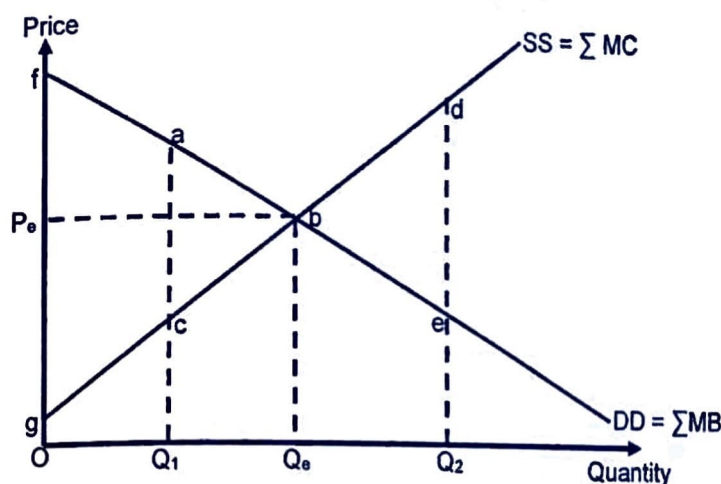
We will first use the perfect competition model as a benchmark to introduce above concepts.

7.1.1 Allocative Efficiency

Allocative efficiency is the situation in which the society produces and consumes a combination of goods and services that maximises its welfare. It is achieved when goods and services wanted by the economy are produced in the right quantities. Assuming the absence of externalities and public goods, allocative efficiency is achieved when the price of the good is equal to the marginal cost of producing that good.

Recall efficiency concepts in the previous topics. Note that efficiency is a recurring theme in the study of microeconomics

Figure 19: Perfectly Competitive Market



Condition for Allocative Efficiency: **Price = Marginal Cost of Production**

Figure 19 shows a perfectly competitive market. The equilibrium output OQ_e and price OP_e are determined by the interaction between market demand and market supply. At this market equilibrium price where quantity demanded equates quantity supplied, allocative efficiency i.e. $P=MC$ has been achieved. This is because:

At output OQ_1 , price, which reflects the marginal benefit derived from consuming the additional unit, is greater than marginal cost of producing the additional unit. This means that society values the last unit of the good more than the opportunity cost of producing that unit. Society will benefit if more units of the good were produced. This under-production of the good by Q_1Q_e leads to a deadweight welfare loss of area abc - the monetary value of all units under-produced causing $MB > MC$.

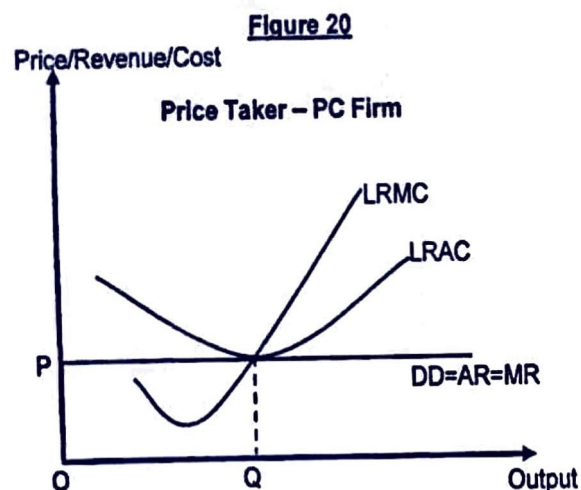
At output OQ_2 , price (marginal benefit derived from consuming the additional unit) is less than marginal cost of producing that additional unit. It means that society values the last unit of the good less than the opportunity cost of producing that unit. Society will benefit if fewer units of the good were produced. The over-production of the good by Q_1Q_2 leads again to a deadweight welfare loss of area bde – the monetary value of all units over-produced causing $MB < MC$.

Allocative efficiency is achieved only when Price = Marginal Cost of producing the additional unit because the value that society places on the consumption of the last unit of good is equal to the opportunity cost of producing it. This occurs at output OQ_1 where quantity demanded = quantity supplied.

At this output OQ_1 , both consumer surplus (P_1fb) and producer surplus (P_1bg) have been maximised. Since their welfare has been optimised, there has been an efficient allocation of resources, assuming no externalities and other sources of market failure.

The concept of externalities and other sources of market failure will be explored in the next topic. From a broader perspective, allocative efficiency is achieved when Marginal Social Benefit equals to Marginal Social Costs.

The Perfectly Competitive Firm Achieves Allocative Efficiency



As shown in Figure 20, the perfectly competitive firm is a price-taker, hence its demand is perfectly price elastic. This means that $Price = AR = MR$, and that the firm can sell as many goods as they want at the prevailing price level P .

As such, at the profit-maximising output level Q where $MR = MC$ and MC is rising, the price P is also equal to the marginal cost. This means the perfectly competitive firm is allocatively efficient.

7.1.2 Productive Efficiency

Productive efficiency is achieved when all resources are fully and efficiently utilized. It is defined as the production of goods and services at the lowest possible average cost of production.

From a macro-economic perspective:

For an economy, productive efficiency is achieved when resources are used to their maximum capacity. That means they are fully and efficiently employed i.e. there is neither unemployment nor under-employment of resources. In this regard, all points on the Production Possibility Curve are productively efficient.

From a microeconomic perspective:

Society's point of view: Productive efficiency occurs at the point where the firm's long run average cost is at its minimum. The firm is operating at its optimum size known as the Minimum Efficient Scale (MES). All internal economies of scale have been exploited. From society's perspective, only the minimum point of the LRAC curve is productively efficient.

Firm's point of view: From the firm's perspective, all points on the long run average cost curve (and not just at MES) are productively efficient as all points on the LRAC curve represent the lowest possible average cost of producing each given level of output. Conversely, when the firm is operating at a point above its LRAC curve, it is X-inefficient. That also means it is productively inefficient from its own perspective.

The Perfectly Competitive Firm Achieves Productive Efficiency

As illustrated in Figure 20, the firm in perfect competition would have attained productive efficiency in long run equilibrium as it is operating at its minimum efficient scale – its lowest LRAC. (The MES is the scale of the plant where the LRAC has stopped falling and the firm has fully exploited all its internal economies of scale).

One possible explanation is that being a price taker, the firm has to be as cost-efficient as possible in order to maximise profits. With only long run normal profits (i.e. zero economic profits), it has to operate at a point on the LRAC curve. If it operates at a point above the LRAC curve, it will be making losses, and will have to leave the industry in the long run.

As explained in the earlier paragraph, since the PC firm produces at its minimum long run average cost (at its MES), hence, it is productively efficient from society's point of view as well.

Study Tip
Use perfect competition model as a benchmark when assessing the relative performances of firms.

7.1.3 Dynamic Efficiency

Dynamic efficiency could be defined as the situation where firms are technologically progressive [through investing in research and development (R&D) for the purpose of product and process innovation] in order to reduce the average cost of production and / or to meet the changing wants and needs of consumers over time.

With R&D and innovation, there can be an improvement in the level of technology resulting in more and better quality output (product innovation). It also brings about new products and/or new production methods to reduce average costs (process innovation). Thus it can lead to a fall in unit cost at every level of output as well as expand the product range of the firm. Hence, society's welfare can be increased with a wider range of better quality products, as well as increased quantities consumed.

However, do note that R&D involves uncertainty as it explores the unknown and untried. Not all investment in R&D leads to innovation.

The Perfectly Competitive Firm Does Not Achieve Dynamic Efficiency

In perfect competition, there is lack of dynamic efficiency as there is no incentive or ability for research and development due to the following reasons:

- o Assumption of perfect information. This means that innovations are quickly replicated by competitor firms or new firms. This discourages research and development as the innovating firm will not be able to reap the fruits of its innovations.
- o Long-run normal profits. This greatly limits the perfectly competitive firm's ability to undertake research and development which creates innovation. Research and development expenditure is often very high e.g. the biomedical industry where purchase of expensive equipment and employment of research scientists are needed to facilitate R & D.
- o Assumption of homogenous products makes innovation to improving quality of product an irrelevant discussion.

7.1.4 Equity

Equity includes fairness in distribution in wealth, income, opportunities, and profits. The idea of equitable distribution is a normative one as it involves value judgment. For example, equity can be interpreted to be

- equality of distribution
- distribution based on need

The type of market structure can deeply affect distribution of wealth, income and profits. Hence, it is important to consider the effects of market structure on equity.

The Perfectly Competitive Firm Achieves Equity

Perfectly competitive markets tend to spread opportunities and wealth widely and more evenly. Without barriers to entry, profits are spread amongst many small firms. In the case of a monopoly, due to the very high barriers to entry, the monopolist is able to earn and retain large supernormal profits. In addition, consumer surplus is maximised at the equilibrium price as $P=MC$. This is unlike a monopoly or in oligopolies where consumers suffer due to exploitative pricing.

7.1.5 Consumer Choice

Many societies deem it desirable that consumers should be given the freedom to choose from a variety of goods and services, as well as to purchase similar goods from different producers.

Again, different market structures affect the choices that are available to consumers.

The Perfectly Competitive Firm Does Not Achieve Choice for Consumers

Perfectly competitive markets do not offer consumers choices in terms of product variety given that goods are homogeneous.

7.2 Comparison of Performance Under Imperfect Competition

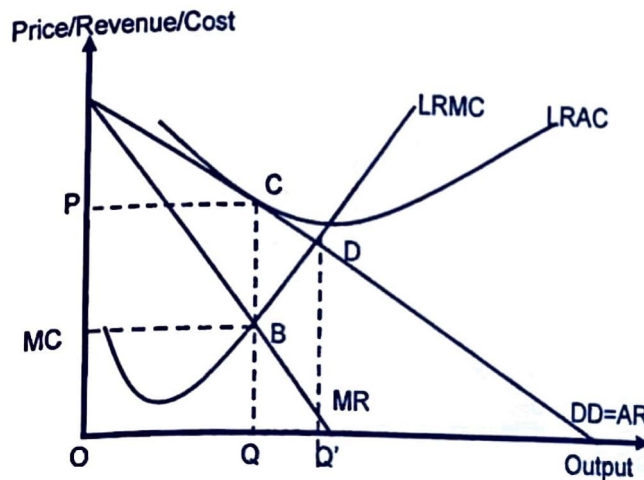
In reality, firms are imperfectly competitive – operating in market structures like monopoly, oligopoly or monopolistic competition where they have varying degrees of market power. In assessing their performance, they are compared against perfect competition – a market structure that exists more in theory – but which attains economic efficiency i.e. both allocative and productive efficiency. In reality, it is the level of market power that the firm has that determines their attainment of efficiency, equity and choice.

Study Tip:
Assess whether market power is desirable based on yardsticks like
(a) Efficiency,
(b) Equity,
(c) Innovation and
(d) Choice from the perspectives of the producers, employees, consumers and government / society.

7.2.1 Allocative Efficiency

Figure 21

Price Setter – Firm in Imperfect Competition



For a firm in imperfect competition, it has a downward-sloping demand curve (AR curve) as it is a price-setter, meaning that it has to lower the price of every single unit of good that it was previously selling at a higher price, in order to sell one additional unit of good. Hence its AR or price is greater than its MR. As such, at the profit-maximising output level Q where $MR=MC$, the price P is greater than the marginal cost, thus the firm is allocatively inefficient. This applies to all firms in imperfect competition.

From society's point of view, the imperfect has under-produced by $Q'Q$. For each unit under-produced, the benefit to society from consuming an additional unit of the good is greater than the opportunity cost of producing it. Society will be better off if additional units of the good were produced. The amount of the welfare loss to society arising from the under-production of the good is represented by area BCD . This is also known as deadweight welfare loss.

How does the degree of market power affect the degree of allocative inefficiency?

Figure 21a

Firm with greater market power, e.g. monopoly or oligopoly

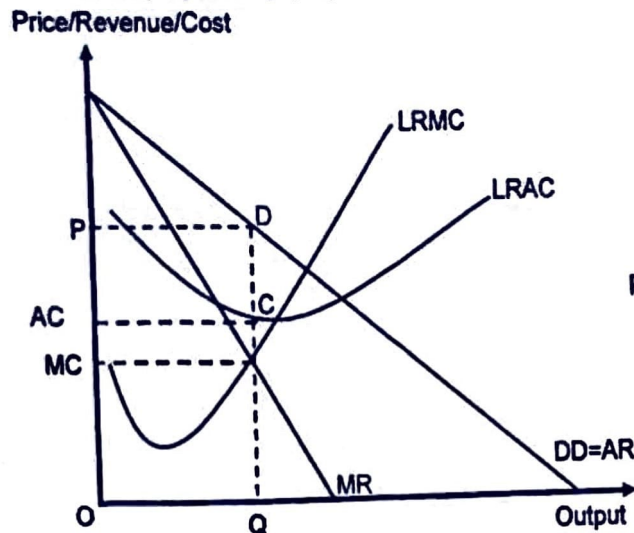
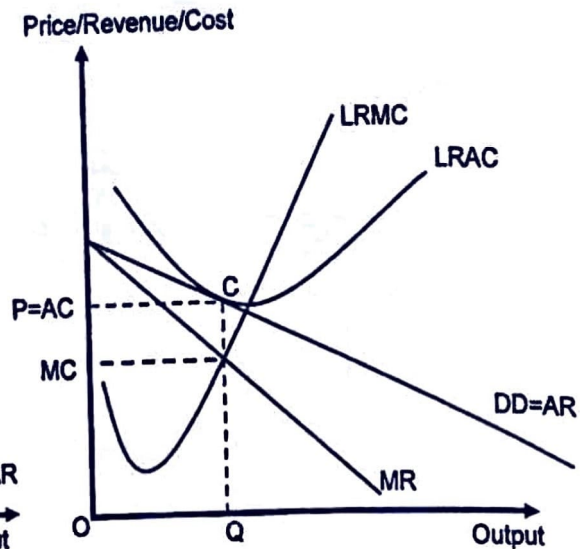


Figure 21b

Firm with less market power, e.g. in MPC



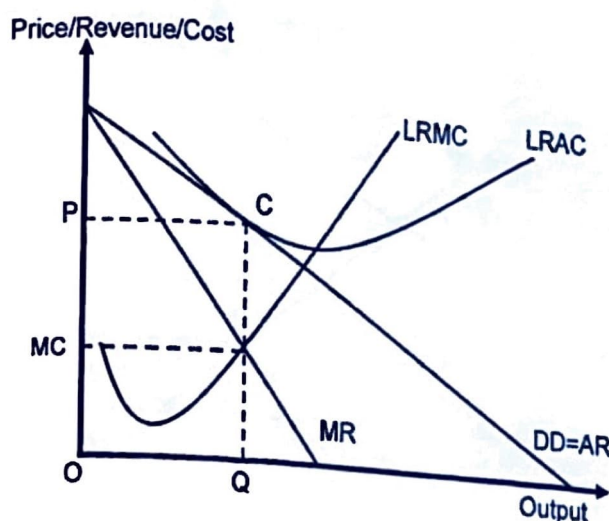
Comparatively speaking across the market structures, the greater the price-setting ability, the less price elastic the demand curve of the firm and in turn the steeper its AR curve. Thus the extent to which price exceeds its own MC will be greater. In this regard, the firm in monopolistic competition has a relatively more price elastic demand than the monopoly or oligopoly (that is, a gentler AR curve compared to the monopoly) because of the presence of many rivals offering close substitutes under monopolistic competition but the monopoly has no close substitutes.

With reference to the above figures, while the firm with less market power (think bubble tea shops operating in MPC) (Figure 21a) is allocatively inefficient, the extent is much less when compared to a firm with a larger degree of market power (think telcos operating in an oligopoly) (Figure 21b). This is shown by the degree to which price exceeds marginal cost, or also known as the mark-up, which is larger in an oligopoly. The inefficiency may be worsened if firms with large market power in an oligopoly engage in anti-competitive behavior by colluding, as they are essentially acting like a monopoly. Consumers are also worse-off with a firm that has greater market power due to the higher price paid.

7.2.2 Productive Efficiency

Monopolistic competition

Figure 22a: Firm in Monopolistic Competition



Firm's point of view

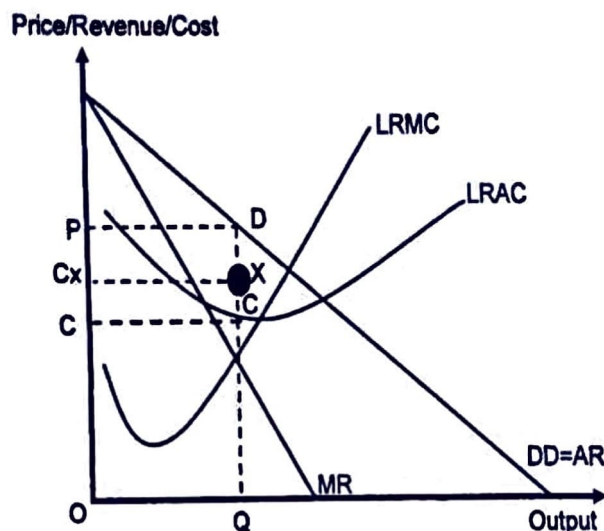
Firms in monopolistic competition are productively efficient from their own perspective. They have to operate at a point on the LRAC curve due to their long-run normal profits. Being X-inefficient by operating at a point above the LRAC curve would result in losses and these firms would face elimination from the industry. This is similar to firms in perfect competition, where the only way to maximise profits is to be as cost-efficient as possible.

Society's point of view

For the monopolistically competitive firm, productive inefficiency from society's point of view arises because they are not producing at the minimum point of the LRAC, i.e. they are operating with excess capacity. Each firm only has a small market share, and demand is not large enough to support producing at MES, thus at profit-maximising quantity Q , the firm is yet to exploit all internal economies of scale available to it (do note that a profit-maximising firm has no reason to aim to produce at MES). However, given the presence of many substitutes and hence relatively price elastic demand curve, it does not miss MES and productive efficiency by much.

Oligopoly and monopoly

Figure 22b: Price Setter – Monopoly or Oligopoly



Firm's point of view

Monopolies and oligopolies, on the other hand, can afford to be X-inefficient (productively inefficient from firm's point of view) – i.e. operating at a point above the LRAC curve. For instance, the firm could be incurring an average cost above point C in Figure 22b. This is because they can retain supernormal profits into the long run due to the presence of complete or high barriers to entry, thus allowing them to continue to exist in the industry even without minimising costs. However, X-inefficiency represents a wastage of resources to society.

Society's point of view

In spite of their inefficiencies, in the case of monopolies or oligopolies (few dominant firms in the market), the output of each firm may be sufficiently large for it to reap significant internal economies of scale than would be the case had production been carried out by many small firms in the economy. It is thus possible for unit cost to be lower in a monopolistic or oligopolistic market than a perfectly competitive one because of large scale production as shown, and the firm is more productively efficient from society's point of view as it is producing closer to the MES.

Recall
Can you illustrate this on a diagram from a previous section?

Wasteful duplication of resources

In some situations, competition may also produce wasteful duplication. Lipsey gives the example of a Cup Final on TV. Suppose 80% of the population wanted to see the game whilst the remaining 20% preferred to watch opera. If there were two competing stations, both stations would want to screen the football game. A two-channel monopoly, however, would screen the match on one channel and the opera on the other. Hence, a monopoly reduces wasteful competition in this case.

Excessive advertising in oligopolies

In a bid to differentiate their products and services, such firms engage in large-scale advertising. This spending can be viewed as wasteful because the resources expended could have been used to produce more goods and services or improve their quality. Like the firm in an oligopoly, firms in monopolistic competition often advertise, albeit to a smaller scale, in order to differentiate their products and increase market share.

Think
Do monopolies have a need to advertise?

Persuasive advertising may represent a form of economic waste, as the resources could have been put to more productive use and can also be argued to be allocative inefficient.

However, if advertising provides better consumer information which helps to move the market closer to a perfectly competitive model in terms of perfect information, then such advertising may not represent wasteful use of resources. Informative advertising seeks to educate consumers on (1) what the benefits and features of a product are, (2) what the product does or can do, (3) how the product compares with competing or similar products in value and benefits, and (4) where it can be bought. The Miller Lite advertisement is an example of an informative advertisement with regards to how its calories and carbs are much lower than the average light beer, specifically Bud Light.

7.2.3 Dynamic Efficiency

The ability of firms to attain dynamic efficiency depends on their willingness and ability to innovate, which in turn depends on the level of competition between firms within the market. Firms in highly competitive markets often engage in innovation to improve the quality of their products to earn higher profits in the short run. In other words, it is observed in the real world that competition is often the 'key driver' of innovation. Such an observation is especially acute in competitive oligopolies and to some extent, in monopolistic competition.

Monopolistic competition

MPC firms are willing to differentiate their products to make them less substitutable as that is their only source of market power. However, MPC firms have limited ability to do so in spite of efforts at innovation because the low entry barriers mean only normal profits in the long run. This is because the technology is relatively easy to copy or replicate in such industries, allowing for the entrance of new firms. The normal profits earned limit their ability to innovate through huge investment in R&D which tends to require significant capital outlay for research facilities. Hence, firms in monopolistic competition tend to merely emphasise superficial product differentiation such as making minor changes to the product, improving on packaging and design as well as improving the quality of service or even ambience. These tend to incur relatively lower costs.

Oligopoly and monopoly

Firms in oligopolies and monopolies enjoy having barriers to entry to the market and hence tend to have long-run supernormal profits, giving them the ability to engage in R&D. In addition, the presence of barriers to entry allows such firms to retain supernormal profits derived from innovation, giving them the willingness to do so. Note that such R&D spending also can act as a further barrier to entry to new firms as potential entrants now face a higher fixed cost. For oligopolies, existing competition amongst the few dominant firms induces them to invest in R&D to differentiate their products from those of their rivals. This also serves to reduce their fear of rivals' reactions to their pricing strategies. Thus, oligopolistic firms might be even more willing than monopolies to innovate.

By extension, a monopolist may not achieve dynamic efficiency as a lack of intense competition and high barriers to entry may result in complacency. Innovation involves risk because of possibility of failure, thus monopolist might not be willing to do so since it is already earning supernormal profits even without R&D (a similar argument applies to collusive oligopolies). Lastly, innovation may erode the value of a monopoly's existing products. For example, a telecommunications company such as Singtel offering new streaming services may cannibalise its existing cable television product.

Recall: Effects of product differentiation

1. Increase dd directly
2. Make dd more price inelastic
3. Reduce degree of substitutability between own good and rivals' goods

Note:

If oligopolists act collusively and jointly maximise industry profits, they will in effect be acting together as a monopoly. In such cases, the disadvantages to society experienced under monopoly will also be experienced under oligopoly.

7.2.4 Equity

Monopolistic competition

Since new firms can easily enter and compete in a monopolistically competitive market, only normal profits are made in the long run and shared by the many small firms in the market. Hence, monopolistic competitive markets tend to spread opportunities and wealth across the society and there is no sustained redistribution of income from consumers to producers. While there is a loss of consumer surplus, the extent is not as great as in a monopoly or oligopoly since there are many rival firms selling close substitutes.

Oligopoly and monopoly

Firms with high market power like monopolies and oligopolies, on the other hand, tend to exacerbate inequity in the economy as supernormal profits are concentrated at the hands of a select few monopolies which have the ability to block potential new entrants or a few dominant producers at the expense of consumers who pay higher prices for a limited quantity of goods. There is also a sustained redistribution of income from households to firms because of the presence of supernormal profits.

Anti-competitive behavior in oligopolies such as collusion and the practice of price discrimination by both monopolies and oligopolies often serve to further reduce consumer surplus.

Nonetheless, it can also be argued that consumer surplus need not necessarily be reduced especially when the monopoly enjoys substantial internal economies of scale, assuming that the cost savings are passed on to consumers. Additionally, if such firms with high market power are listed companies, supernormal profits find their way back to households through distribution of dividends or rise in share prices.

7.2.5 Consumer Choice

For monopolies, consumers do not have a choice as to which variant of the product to purchase given that the product of a monopolist is unique.

In the case of MPC and oligopolies having differentiated products, consumers can choose the firm from which they want to buy as there is product differentiation. Consumer sovereignty, however, is enhanced under MPC because there are more firms for consumers to choose to purchase from.

However, there is also a possibility where oligopolies tend to engage in product proliferation whereby a firm produces a range of products that cater to the tastes and preferences of consumers. For example, Procter & Gamble (P&G) - the number one consumer products manufacturer in the world - has many lines of shampoo under its name (Clairol, Head & Shoulders, Herbal Essences, Pantene, Vidal Sassoon). Its rival Unilever, has Clear, Organics and Sunsilk among other lines. Through product proliferation, P&G and Unilever attempt to cater to the varied needs of their consumers.

THINK
What incentivises the oligopolist to engage in product proliferation?

7.3 Theory of Contestable Markets (An Alternative Theory to Market Structures)

The theory of contestable market argues that what is crucial in determining price and output is not whether the size of the firms is small or big relative to the market, but whether there is a real threat of competition.

Key conditions for a perfectly contestable market include

- A market is **perfectly contestable** when entry into and exit from the market by potential rivals is costless, and when such entry and exit can be made very rapidly. The moment it becomes possible to earn supernormal profits, new firms will enter, thus driving profits down to a normal level.
- No exit costs**, for example **no sunk costs**. The absence of exit costs reduces the risks of entering the market and/or increases the potential entrants' ability to enter the market.

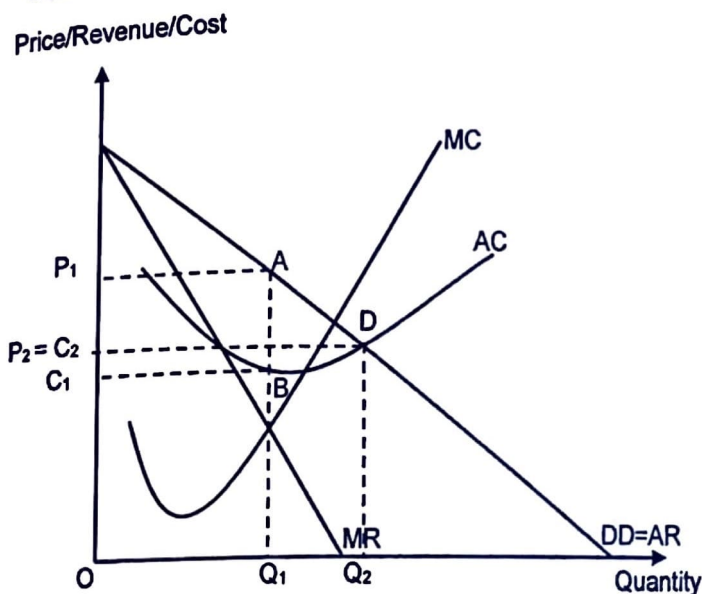
Costless exit (no sunk costs) encourages firms to enter an industry because they know that if they are unsuccessful in the industry, they can transfer their capital equipment elsewhere. For instance, a rival coach company may open up a service on a route previously operated by one company. If the new firm cannot survive in this market, it can still use the coaches it has purchased for a different route or a different purpose. The cost of coaches is not a sunk cost. Hence, if the capital equipment can be transferred to another market, the exit costs will be zero or relatively low and new firms will be more willing to take the risks of entry.

On the other hand, if the capital equipment cannot be transferred to other uses, as would be the case, for example, with a power station, the losing firm is left with capital equipment that it cannot use. Hence, the firm will be deterred from entering in the first place. The market in this case is not perfectly contestable, and the established firm can continue to make supernormal profits.

- Perfect information** and the ability and/or the right of all suppliers to make use of the best available production technology in the market.
- Low consumer loyalty** which reduces the risks of entering the market.

The theory thus implies that the threat of firms entering the market will ensure that the incumbent firm (even if it is a monopoly) will be efficient.

Figure 23: Pricing Under Contestability



Key concept:
Explain the factors that determine the contestability of a market.

Allocative efficiency

Regardless of whether an industry is made up of a small number of firms or just one firm, the firm/s may still behave competitively and price its product competitively as long as the market is contestable. As a result, supernormal profits may not be that large, the firm will price its product closer to making normal profits at P_2 than maximising profits at price P_1 , i.e. practicing limit pricing. In Figure 23, when $AC=AR$ or $P_2=C_2$, normal profits are made, a return sufficient to keep its factors of production in their present use.

Study Tip:
Understand how the contestability of markets will affect oligopoly / monopolies behaviour and the effects on consumers' interests.

Productive efficiency

If a market is contestable, inefficient firms (including monopolies) cannot survive. They have to change their ways or leave the industry in the long run, and hence will seek to produce as efficiently as possible, thus moving towards producing at a point on the LRAC curve (productive efficiency from the firm's point of view).

Dynamic efficiency

The possibility of supernormal profits attracts new entrants into the industry producing new and competing products. This point was formalised by Joseph Schumpeter and his concept of 'Creative Destruction'. He argued that entry barriers are not a serious problem in the very long run when the level of technology changes. Entry barriers are the very stimulus to the creativity required to destroy the barriers. He argued that monopoly profit is 'the most powerful engine of progress and in particular, the long run expansion of total output'. Thus, he claimed that "in this respect, perfect competition is not only impossible but also inferior and has no title to being set up as a model."

In the case of monopolies, with possible long run supernormal profits due to complete barriers to entry and exit, a monopoly has the ability to invest in expensive R&D projects. And it is likely to do so when it faces a credible threat from a potential entrant.

In summary, the failure to price competitively and be as cost-efficient as possible will turn potential competition into actual competition due to ease of entry under contestable markets.

Hit and run competition

Firms may engage in '*hit and run*' tactics whereby they enter a market for a short period when profits are high and then quickly withdraw.

For example, a small delivery company may set up a parcel delivery service, and rival the national postal service at Christmas time to take advantage of the increased demand. The fear of such competition may prevent the national postal service provider from charging high prices in the first place.

Conclusion

The theory allows improvement on the simple monopoly theory that focuses only on the existing structure of the industry and does not take into account the possibility of new entrants. To some economists, the theory suggests a new way to encourage firms to act like perfect competitors. Rather than direct interference in the decisions made by firms, government efforts should perhaps be directed at making markets more contestable i.e. lowering entry and exit costs. One such way is to grant more licenses to allow the entry of new firms.

7.4 Price Discrimination and the Public Interest

7.4.1 Benefits

Greater equity for consumers

Price discrimination can benefit consumers from lower income groups who tend to be the relatively more price sensitive (more price elastic in demand) consumers. They will benefit from relatively lower prices charged under price discrimination because it can allow them to consume a good or service which they could otherwise not afford.

E.g. In the legal services, law firms can practice *third-degree price discrimination* and charge, for the same legal advice, low-income consumers a lower price than high-income consumers. This is because low-income consumers have a higher price elasticity of demand than high-income consumers because legal fees as a proportion of income is higher for low-income consumers than high-income consumers.

E.g. Drugs companies might justify using *third-degree price discrimination* by selling their products at inflated prices in countries where incomes are higher (which means proportion spent on drugs is lower) because they can then sell the same drugs to patients in poorer countries at much lower prices. Profits made in one market may allow firms to cross-subsidise loss-making activities/services that have important social benefits.

Higher profits for firm

The price-discriminating producer is able to extract consumer surplus and add to its revenue and thus earn higher profits, *ceteris paribus*. Higher profits may benefit society if these profits are re-invested into research and development which leads to product improvement and cost reductions.

In addition, the higher profits might allow the producer to survive a recession.

7.4.2 Costs

Less equitable

Producer surplus increases at the expense of consumer surplus. As illustrated earlier, there is a loss of consumer surplus with price discrimination. Hence, producers benefit at the expense of consumers, and it worsens the sustained redistribution of income from consumers to producers.

Unfair strategy to keep potential entrants out

The price-discriminating monopolist uses its higher profits to set up strategic barriers to keep out potential entrants.

Sectional Summary:

- Under perfect competition, production will be at the point where $P = MC$. This can be argued to be optimal. Perfect competition can act as a spur to efficiency and bring benefits to the consumer in terms of low costs and low prices.
- On the other hand, perfectly competitive firms may be unwilling to invest in research and development or may have insufficient funds to do so. They may also produce a lack of variety of goods. Finally, perfect competition does not necessarily lead to a fair distribution of income or *guarantee an absence of harmful side-effects of production*.
- Monopolies may be against the public interest to the extent that they charge a higher price relative to cost than do competitive firms; if they cause a less desirable distribution of income; if a lack of competition removes the incentive to be efficient and innovative; and if they exert undesirable political pressures on governments.
- On the other hand, any economies of scale will in part be passed on to consumers in lower prices, and the monopolist's high profits may be used for research and development and investment, which in turn may lead to better products at possibly lower prices.
- Monopolistically competitive firms, because of excess capacity, may have higher costs than perfectly competitive firms, but consumers may gain from a greater diversity of products.
- On other hand, monopolistically competitive firms may have fewer economies of scale than monopolies and conduct less research and development, but the competition may keep prices lower than under monopoly.
- Whether oligopoly behaviour is in the public interest depends on the particular oligopoly and how competitive it is; whether the firms engage in extensive advertising and of what type; whether product differentiation results in a wide range of choice for the consumer; how much of the profits are ploughed back into research and development; and how contestable the market is. Since these conditions vary substantially from oligopoly to oligopoly, it is not quite possible to simply state how well or how badly oligopoly in general serves the public interest.
- Potential competition may be as important as actual competition in determining a firm's price and output strategy. The threat of this competition increases as entry and exit costs to and from the industry diminish. If the entry and exit costs are zero, the market is said to be *perfectly* contestable. Under such circumstances, an existing monopolist will be forced to keep its profits down to the normal level if it is to resist entry by new firms. Exit costs will be lower, the lower are the sunk costs of the firm.
- The theory of contestable markets can provide a more realistic analysis of firms' behaviour than theories based simply on the *existing* number of firms in the industry.

*****END*****

Appendix 1: Mathematical Relationship Between TR, AR and MR

Table 1: Total, Average and Marginal Revenue for a Price-taking Firm

Quantity (Q)	Price (P)	Total Revenue (TR)	Average Revenue (AR = TR/Q)	Marginal Revenue (MR = $\Delta TR / \Delta Q$)
0	-	-	-	-
1	\$6	6	\$6	6
2	6	12	6	6
3	6	18	6	6
4	6	24	6	6
5	6	30	6	6

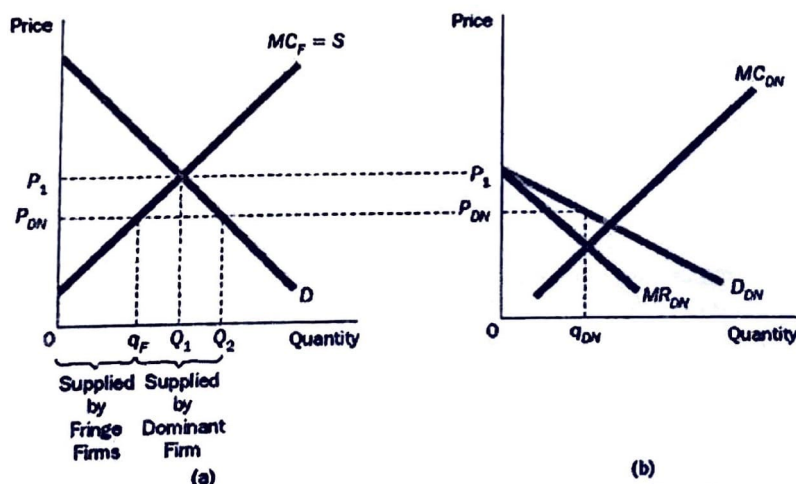
Table 2: Total, Average and Marginal Revenue for a Price Setter (assume uniform pricing)

Quantity (Q)	Price (P)	Total Revenue (TR)	Average Revenue (AR = TR/Q)	Marginal Revenue (MR = $\Delta TR / \Delta Q$)
0	-	-	-	-
1	\$10	10	\$10	\$10
2	9	18	9	8
3	8	24	8	6
4	7	28	7	4
5	6	30	6	2

Appendix 2: Diagrammatic Analysis of the Price Leadership Model (Tacit Collusion)

- According to figure below, the dominant firm sets the price that maximizes its total profits – produces q_{DN} and sells at price P_{DN} . The followers (fringe firms) behaves like a price taker and sells at the same price P_{DN} , similar to firms operating in a perfectly competitive industry. The fringe firms produce q_F at price P_{DN} . The dominant firm will supply the rest of the output – $(Q_2 - q_F)$ which is equal to q_{DN} at the same price P_{DN} .

Figure: Price Leadership Model



However, there are problems associated with tacit collusion. Fringe firms (followers)

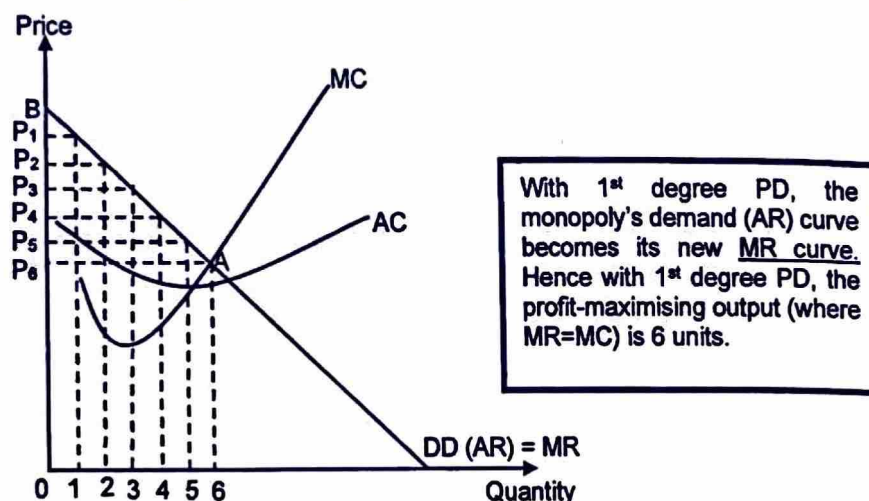
might choose to go against the set price, triggering price wars and it usually occurs when there is an excess demand for the product and the fringe firms have excess capacity. Some firms may also set their own price if their products are sufficiently differentiated.

Appendix 3: First and Second Degree Price Discrimination

I. First-degree / Perfect Price Discrimination

- Ideally, a firm would like to charge a different price for each of its unit sold. If it could, it would charge each customer the maximum price that he is willing to pay for each unit. This is because the less price sensitive (less price elastic in demand) consumers are, the more willing they are to pay a higher price, and vice versa.
- The practice of charging each customer the maximum price that he is willing to pay for each unit bought is called first degree price discrimination or perfect price discrimination ¹. Under such circumstances, the firm is able to capture all consumer surplus, leaving consumers with zero consumer surplus.

Figure: First Degree Price Discrimination



- In the figure above, with first degree price discrimination, each unit is sold based on the willingness to pay as indicated by P_1 for the first unit, P_2 for the second unit and so on from the demand (AR) curve. Thus all consumer surplus P_6BA has been transferred to the monopoly.
- Since each consumer is charged exactly what he is willing to pay, the MR or incremental revenue earned from each additional unit sold is simply the price (AR) paid for that unit. Thus the MR curve is the monopolist's demand curve.
- In practice, first degree price discrimination is almost never possible. Firstly, it is usually impractical to charge each and every customer a different price. Secondly, a customer will not, under normal circumstances, reveal the maximum price that he is willing to pay for each unit of the good.

¹ We are assuming that each customer buys one unit of the good. If a customer bought more than one unit, the firm will have to charge different prices for each of the units.

- An example of first-degree price discrimination is the case of auction sites whereby one's bid determines the maximum price that one is willing to pay for the good.

II. Second-Degree Price Discrimination

Second-degree price discrimination is a pricing strategy whereby the firm charges a different price to different groups of customers buying the same product by offering them various pricing choices and allowing them to choose among the different options. Second degree price discrimination is undertaken when firms are unable to segregate customers based on observable characteristics such as age, geographical location or past purchasing behaviour.

Examples of second-degree price discrimination include:

- **Quantity discounts:** NTUC FairPrice charges customers \$2/- when they buy a bag of 4 apples but will charge customers who prefer to buy just one apple \$0.80. This is because customers who buy larger quantities of a product tend to have a higher price elasticity of demand than those who buy smaller quantities as more money is involved which means expenditure on apples is likely to form a larger proportion of income for those who buy in larger quantities than for those who buy in smaller quantities. NTUC, however, cannot tell in advance who will buy the larger quantity. Hence, it offers customers various pricing choices and allows the customers to choose among them.
- **Concert ticket pricing:** The organizer of a concert does not have knowledge on the purchasing power or PED of potential customers. Ideally, the organizer would like to charge wealthier customers or die-hard fans a higher price due to their price inelastic demand. In order to get customers to reveal their PED, the organizer charges higher prices for seats in the zones that are closer to the stage. The lower PED group would therefore select these expensive tickets due to the perceived difference in concert experience which might be superficial. The price sensitive group would select the cheaper tickets although they arguably enjoy the same view.
- **Bundling of products:** A form of promotional price adjustment that offers discounted pricing when customers purchase several products at the same time. As such, the products when sold in bundle will cost less than if they were purchased individually. As marketing strategies become sophisticated, multiple intra -or inter- product purchases tend to be priced differently from the simple sum of component prices - the bundle discount is utilized to entice customers into buying multiple products from the same vendor. For example, Microsoft Office is sold as a bundle of computer software, including Word, Excel, and PowerPoint; Nintendo sold the most products when it offered a bundle option—a video game console and a game sold together as one package—*coupled with an option to buy each piece individually*. Additionally, incumbents like Apple has recently launched its new subscription bundle, known as the Apple One, that includes Apple Music, Apple TV+, Apple Arcade, iCloud storage. This product offers three tiers of bundled Apple services designed to increase demand for services that have not seen growth in the recent years such as Apple TV+.

However, such pricing strategies can lead to cannibalisation of products that can be bought outside of the bundle. For example, Apple can sell Apple TV+ and Apple Music together, but also separately. However, given that more subscriptions of Apple TV+ can be sold through the bundle than on its own, it leads to lower demand for the product when sold separately. Furthermore,

if some products are not sold separately, some consumers may not be incentivized to even buy the bundle since they are likely to feel that they are "forced to buy more" than they really want or need to. Furthermore, bundling may negatively affect the demand of the more popular products sold by the firm if they are bundled with the less popular products, with a higher price being charged for the more popular product than previously. As such, consumers may be unwilling to spend more on the product that they were previously purchasing at a higher price even if they are getting an "additional item".

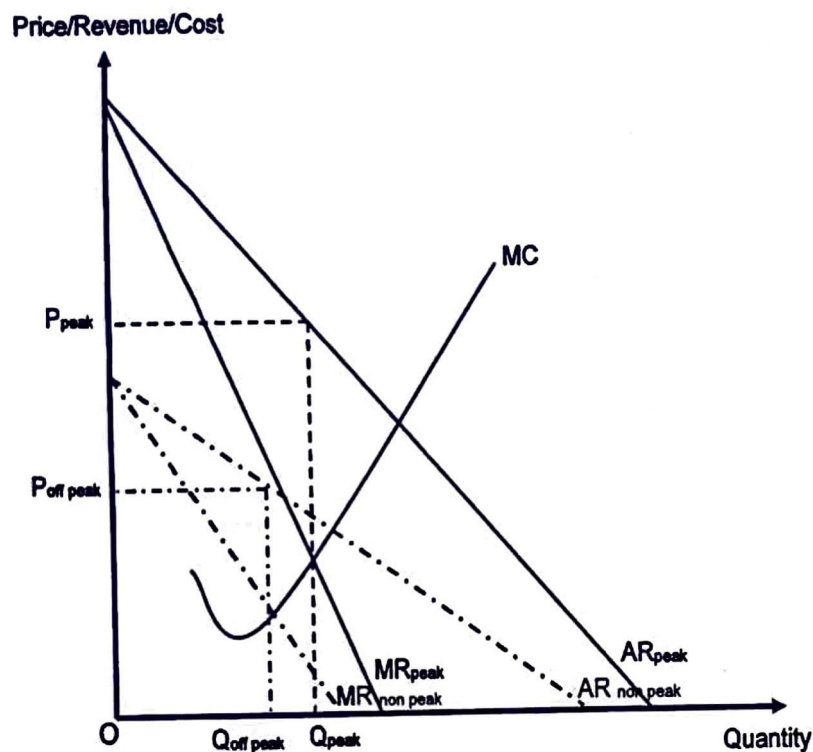
Appendix 4: Case studies of Price Discrimination

Case Study 1: Peak Load Pricing: (Inter-temporal Price Discrimination)

Source: John Sloman

Is peak load pricing a form of price discrimination? Peak load pricing is where people are charged more at times of peak demand and less at off-peak times. Take the case of a holiday. If you look through the brochures, you will see that high season prices are often considerably higher than low season prices. Other examples of peak load pricing include air fares, prices in cinemas and restaurants (higher in the evenings).

Figure



Peak load pricing can be considered a form of price discrimination because the reason for the higher prices charged at peak times has partly to do with price elasticity of demand. Demand is less price elastic at peak times. For example, many people will tend not to watch the movies during the weekdays, considering that there is school or work the following day.

But often the higher charges also have to do with higher marginal costs incurred at peak times and, as such, are not true price discrimination. With various fixed factors (such as

plant and equipment), marginal costs are likely to rise as output expands to meet higher demand. This could be due to diminishing returns to the variable factors; or it could be due to having to use additional equipment with higher operating costs.

Take the case of watching a cinema during the weekdays versus the weekends. At off peak times, the cinemas will have perhaps simply 2 counters open for ticket sales. At periods of high demand, the cinema may require to open more counters or perhaps hire extra staff for crowd control. As a result, the marginal costs of operating at weekends are higher than during the weekdays.

There are 2 reasons why the price is higher for peak period. First, demand/AR under peak period is less price elastic than demand/AR under non-peak period (Figure 18). This is demonstrated by the fact that price is a higher percentage above MR in the peak period than in the off peak period. Second, marginal cost is higher in the peak period.

Case Study 2: Freemium Model

A freemium model refers to a strategy used by firms where they provide a basic version of a product free of charge to the user. However, if the consumer or user must pay for the additional features or advanced functionalities of the product. The freemium strategies, sometimes, exploit network effect. As firms offer the free version of a product, they are likely to expand their consumer base. However, in order to generate revenue using the freemium model, the firms have to gain enough of a network advantage to succeed in the market.

Such a pricing strategy is designed to nudge consumers to influence their demand to stimulate higher sales by deliberately manipulating how the products and choices are presented to the consumers. Its goal is to influence what consumers choose, either to steer them toward options that the marketer believes are good for them or simply to stimulate purchases and increase sales. Therefore, when firms employ the freemium subscription model in running their businesses, it increases the demand for the firm's product and reduces the degree of substitutability of the product offered by these firms.

This is a common strategy used by firms in online gaming and technology-based industries. In the last decade, the online gaming industry has grown rapidly. The free-to-play coupled with the in-game (token) purchase model (freemium model) has become the dominant revenue model for this industry. For example, Google uses the 'freemium' strategy for its services by providing the basic service or product free of charge, but consumers will be charged for additional features, services that expand the functionality of the free version of the product. Google One subscriptions will now include three free months of Stadia Pro, which allows users to stream and play video games on a variety of devices. Amazon Prime is also another classic example of "habit driver" where consumers joined for free shipping and now consumers go to Amazon for every single product out there.

Network effect refers to any situation in which the value of a product or service depends on the number of buyers or users who leverage it. Typically, the greater the number of buyers or users, the greater the network effect—and the greater the value created by the offering. In other words, the buyers' willingness to pay increases as the number of buyers for the product grows. Refer to Page 28 for Network Economies.

Appendix 5: The Case of the Banking and Financial Sector

During the pandemic, the financial and banking sector transformed the way it delivered its services. Bank leveraged on disruptive technology to remain profitable by introducing digital options to provide services as well as digital assets. Leveraging on disruptive technology allowed banks to retain or increase demand for their services and hence total revenue. However, more importantly, it allowed banks to undertake branch consolidation to cut costs and leverage on their digital channels for running business since consumer behavior has changed deeply. Furthermore, banking processes that are repetitive are being replaced by robotic automation and artificial intelligence, known as "smart automation" or "intelligent automation". With a fall in average and marginal costs and

increase in demand, firms could see significant rise in their profits by leveraging on disruptive technology.

However, the banking industry face greater competition from other intermediaries, increasingly digital, in their core business such as payment and advisory services. Disruptive technologies have given rise to the FinTech sector, which is essentially the use of innovative information and automation technology in financial services. As such, digital technologies have a large impact in terms of increasing competition and contestability in the banking industry, forcing older incumbents like POSB, Deutsche Bank, Santander and Barclays to restructure the way they provide services to their customers. Digital disruption provides opportunities to potential entrants and rivals opportunity to improve efficiency with innovation, increasing pressure on the profit margins of the incumbents. Incumbents that are still over reliant on overextended branches, they will continue to lose their customers, in particular, the younger generations who prefer to bank with their mobile phones, to those that have adapted well to the digital revolution.

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TUTORIAL PACKAGE

Section A: Short Structured Questions

1. Which of the following is likely to be fixed costs or variable costs for a chocolate factory over the course of a month?
 - (a) The cost of cocoa.
 - (b) An advertising campaign for a new chocolate bar.
 - (c) The cost of electricity for running the mixing machines.
 - (d) Overtime pay.
 - (e) Wear and tear on wrapping machines.
 - (f) Interest on a mortgage for the factory: the rate of interest rises over the course of the month.

2. For each of the following examples,
 - (i) State if the economies of scale is internal or external
 - (ii) Identify the type of internal/external economies of scale
 - (a) Supermarkets such as Sheng Siong have larger bargaining power with suppliers.
 - (b) Listed companies can finance their operations through public issue of shares.
 - (c) Pharmaceutical firms make use of the talent pool and R&D infrastructure at Biopolis.
 - (d) A wafer fab producer benefits from R&D findings by leading players in the industry.
 - (e) Retailers make use of large-scale IT network systems to keep track of inventory flow.
 - (f) Firms employ specialists to improve the efficiency of different stages of production.

3. Firm ABC is a textile company. Explain with the aid of diagrams, the possible impact of the scenarios below on Firm ABC's cost curves (indicate whether ATC and/or MC have shifted and in what direction and explain why).
 - (a) The government reduces its rental charges for SMEs such as Firm ABC.
 - (b) The government imposes a levy on foreign labour.
 - (c) Quotas on imports are relaxed, allowing cheaper imported textile to enter the country.
 - (d) The country experiences double-digit economic growth.

Section B: Case Study Questions

Case Study 1: The Airline Industry

The data is based on a scheduled flight between London and New York by British Airways.

Table 1: Seating Capacity

	No. of seats	Ticket price (£)
First Class	18	2,000
Business Class	74	1,100
Economy Class	294	350

Table 2: Costs

	£
Flight crew, salaries and expenses	9,250
Aircraft fuel and oil	11,882
Landing fees and navigation charges	9,920
Catering fees – 2 meals for the 8-hr flight	10,820
Payment for free gifts of comfort packs and drinks	5,050
Ground services including aircraft maintenance for the flight, aircraft cleaning and other airport facilities	17,200
Contribution to airline overheads, including general administration, depreciation and interest payment to banks	68,350

Extract 1: British Airways-Qantas merger talks begin

British Airways confirmed that negotiations with Qantas for a merger were taking place in a brief statement, after reports surfaced in Australia that a deal was in the pipeline.

Should the agreements go ahead, the airlines would be able to slash operating costs by merging many of the back office operations such as administration and ticket sales. A pairing with the Australian carrier would create a global corporation with £15.4 billion annual sales and a 43 per cent market share of the London to Sydney service.

The past year has been the toughest for the airline industry since the aftermath of September 11. While plummeting oil prices have given the industry some relief, the global economic crisis has led to a dramatic drop in the number of people flying. A series of banking collapses have led to a sharp fall in demand for expensive business travel – upon which many airlines depend. Airlines have been forced to axe routes and let many of their employees go. In a desperate effort to fill their planes, they also offer millions of cheap seats.

Meanwhile, budget airlines such as Ryanair continue to chip into the market share of its struggling rivals with "lean and mean" cost-cutting and reduced fares.

Source: *The Daily Telegraph*, 02 Dec 2009

Extract 2: Why is Ryanair successful?

Over the last decade, the rate of growth of the low cost airline market in general and Ryanair in particular has been remarkable. As a whole, the low cost air market is growing at a faster rate than the overall growth of air travel.

The secret to their success is actually very simple: 'low cost' means exactly what it says, and the business philosophy would seem to be that as long as attention remains devoted to minimising costs, profitability will take care of itself. For an example, with Internet booking, administrative costs of running call centres and the expense of paying commission to travel agents can be avoided. They do not offer frequent flyer loyalty

schemes commonly associated with the traditional full-service airlines. There is also no free services on board a low cost flight. Instead, highly profitable charges are levied for food, drink and other ancillary services. Budget airlines make fuller use of 'secondary' airports with lower landing charges than the main airport of the destination city. Another characteristic is that budget airlines tend to run a fleet of aircraft composed entirely of the same model, it can benefit from economies of scale in the costs of training staff. Pilots, mechanics and flight attendants have to know how to operate or service only one kind of aircraft.

Adapted from Economics Today, "Why is Ryanair successful?" March 2008

Questions

- (a) With reference to Table 2, identify an example of
- (i) fixed cost [2]
 - (ii) variable cost [2]
- Explain your choice.
- (b) Calculate the airline's profit per flight if all seats are sold. [2]
- (c) (i) Using Table 2, explain two possible cost advantages of being a large airline company such as British Airways. [4]
- (ii) Explain why despite the cost advantages of being large, there are smaller airline companies such as Ryanair which manage to keep costs low. [4]
- (d) (i) Using the concept of price elasticity of demand, account for the relative price levels of economy and business class tickets. [4]
- (ii) With reference to Extract 1, explain two possible reasons why air ticket prices have fallen for British Airways. [4]
- (e) Discuss whether the merger between British Airways and Qantas should be a matter of concern. [8]
- [30m]

Case Study 2: Supermarket development and competition

Extract 1: China's supermarkets present export opportunity

Rising incomes and an expanding urban middle class are setting the stage for China's development as a market for imported goods. Until recently, many foreign exporters considering the Chinese market were discouraged after encountering a fragmented market made up of thousands of old-style family owned shops, open-air markets and inefficient systems for the distribution of imports. The good news for food suppliers is that 'supermarketisation' is transforming China's food sector into a modern retail system. Modern supermarkets and hypermarkets - retail formats nearly non-existent in China in the early 1990s - have now captured an estimated 30% of the urban food market and are growing at rates of over 30% annually. Chinese supermarkets grew from just one outlet in 1990 to approximately 60 000 stores by 2003. Supermarkets began developing in China in the early 1990s, encouraged by local governments. Multi-national chains from Europe, Japan, Hong Kong and the United States provided a second major impetus in the development of the sector in the mid 1990s. They have about 40% of the sector's sales but domestic companies such as Lianhua and Hualian have developed quickly. Local governments are actively encouraging the transition to supermarkets by shutting down traditional street markets and in some cases converting them into supermarkets. In 2004, China's Ministry of Commerce announced a five-year plan to develop a rural retail network of supermarkets in small towns.

Imported foods, until recently a rarity in China, are now widely available in Chinese supermarkets. China's growing middle class has the purchasing power to afford imported foods, but this crucial market segment has been kept largely out of reach of the world's food exporters by the combination of China's old-fashioned marketing system and high trade barriers. However, China has cut tariffs, import trading licensing requirements and state trading monopolies as a result of its entry into the World Trade Organisation in 2001. Lower trading barriers are the first step to opening the Chinese market, but a competitive, efficient domestic marketing system is necessary to get imported products from entry points to the Chinese consumer. That's where supermarkets come in.

Source: Fred Gale and Thomas Reardon, Asia Times, 24 June 2005

Extract 2: Let China's retail wars begin

In keeping with the conditions for China's membership of the World Trade Organisation, China has lifted most restrictions on foreign retailers. Gone are the limits on the number of stores, rules confining them to large cities and regulations capping the foreigners' stake in local ventures at 65 %. China erected those hurdles to give its own companies a chance to copy the West's big store model - and they have done so with great success. The top four retailers in the country are all run by the government or local entrepreneurs. But the foreign companies are not far behind and they have big plans for expansion now that the barriers have come down. Paris-based Carrefour has some 240 stores in China, and plans to open as many as 150 more this year. Its 2003 sales of US \$1.8 billion made it China's fifth biggest retailer. Consolidation is sweeping the sector, too. Shanghai Ballion, which has nearly 5000 stores, has won permission to take over four rivals. Beijing's ultimate goal is to create a small number of big players that will be strong enough to compete with the multinationals at home and expand overseas.

Source: Business Week online, 17 January 2005

Extract 3: Supermarkets in the UK: a model for China's retail sector?

Tesco may have to sell off stores

Tesco, the UK's biggest supermarket group, may be forced to sell off some of its shops in what would be a dramatic intervention aimed at curbing the retail giant's dominance. There is a call for government regulators to intervene to force Tesco into divestment, the process of selling off stores.

The UK's top four supermarkets have a huge market share which is continuing to grow. In the next ten years Tesco could have 1200 smaller convenience stores in addition to its large supermarkets. Asda, one of Tesco's major competitors, is poised to follow suit. Ten years ago supermarkets did not compete in the smaller convenience store market. In the four years to 2004, 7377 independent convenience shops, more than 20 % of the total, closed. In addition, the buying power of the supermarkets is so great that their

suppliers complain that they are forced to sell to supermarkets at very little profit. 'There is certainly a case for divestment,' says the policy director at the New Economics Foundation. 'The market place is being strangled by the big four.' However, a spokesperson for Tesco said, 'I think the public interest would need to be looked at in a proper manner by government regulatory authorities and I would hope that when they talked to us and looked at our operations in detail they would come to the view that divestment was a bad idea'.

Source: Observer, 6 November 2005

Table 1: Top four UK supermarkets: share of grocery sector

Share of Grocery Sector (by value of total sales)	2004 (%)	2005 (%)
Tesco	28.1	30.5
Asda	16.6	16.7
Sainsbury	15.4	15.7
Morrisons	13.9	11.3

Source: TNS Superpanel

Extract 4: Supermarkets in Singapore: the food retail sector

For many years the food retail sector has been dominated by 'wet markets' and general grocery shops, but this pattern is changing with the rapid expansion of modern supermarkets. NTUC Fairprice and the Dairy Farm Group are the two largest supermarkets for retail food. Cold Storage and Shop n' Save supermarket chains are subsidiaries of the Dairy Farm Group.

Wet markets still represent the bulk of sales of products such as vegetables, seafood, rice, eggs and chicken, while dedicated fruit shops still sell most of the fresh fruits. However, supermarkets are gaining market share in all retail food products.

Singapore has a significant domestic industry manufacturing a range of food and beverages, but virtually all raw materials are imported, as there is almost no local agricultural production. Singapore's multi-racial society and the presence of a large expatriate population have led to a diverse and rich variety of food types being available to customers.

Source: Australian Government: Austrade, Guide to Australian Exporters Webpage 2005

Table 2: Singapore retail sector: retail sales index for selected types of outlet

Type of Outlet	Index at Current Prices (1997=100)				
	2000	2001	2002	2003	2004
Department Stores	104.3	99.9	100.4	99.6	108.4
Supermarkets	123.0	138.3	147.1	158.5	151.1
Provision and Sundry Shops	100.6	104.6	109.6	113.8	123.2
Total retail sales	128.4	133.1	129.8	140.9	158.6

Source: www.singstat.gov.sg

Questions

- (a) Compare the change in retail sales in Singapore by type of outlet between 2000 and 2004. [2]
- (b) Explain two reasons why supermarkets are growing so quickly in China. [4]
- (c) (i) Describe the type of market structure operating in the UK grocery store in 2004. [2]
(ii) Explain how the firms in this market might compete against each other. [4]
- (d) Discuss the policy of divestment in the case of Tesco explaining clearly how this might affect consumer welfare. [8]
- (e) In the light of the data provided, if you were an economic advisor to the Singapore government, would you recommend that it should follow the example of the Chinese authorities and encourage supermarket development? Justify your answer. [10]

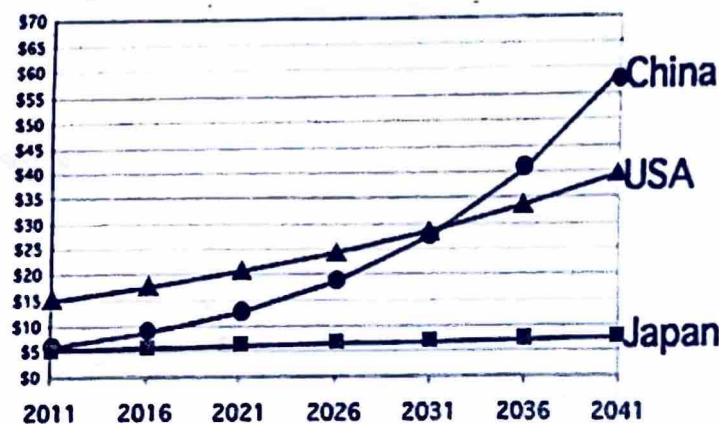
Case Study 3: OTT Disrupts Telco Market

Table 1

Top five countries by online TV & video revenues (\$ million)					
Ranking	Country	2017	Ranking	Country	2022
1	USA	21,618	1	USA	33,094
2	China	4,670	2	China	12,222
3	Japan	2,944	3	Japan	4,409
4	United Kingdom	2,656	4	United Kingdom	4,249
5	Germany	1,337	5	Germany	2,301

Source: BroadbandTV News, October 2017

Figure 1: National Income Projection (trillions of \$US)



Source: Treeofmamre.wordpress.com

Extract 1: The Rise of Over-the-top (OTT) Internet Delivered TV²

The pace of digital disruption that is transforming the TV industry is accelerating: the growth in internet-delivered TV content is reshaping distribution models, consumer viewing habits and advertising. Every major TV operator has launched or is in the midst of launching and scaling up their direct-to-consumer streaming offerings. Consumers now have more choice than ever – from DirectTV Now, FuboTV, Sling TV, PlayStation Vue and YouTube TV, to name just a few. Philo is another recent entrant that offers 30-plus entertainment channels. Disney has plans to launch two streaming services and may develop even more following its 21st Century Fox deal.

Source: Forbes, January 2018

Extract 2: TV Cuts the Cord – More Ditching Cable for Internet Platforms

The revolution - called cord-cutting - has spread worldwide. Singaporeans are one of the fastest-growing audiences in the world for on-line TV platforms, with the number of subscribers for such services here doubling in the past year. Netflix launched in Singapore in January last year, followed by the likes of Viu, a specialist in Korean content, and Amazon Prime Video, all OTT (over-the-top) services delivering

² OTT refers to an app or service that delivers content (audio, visual, etc.) over the internet.

entertainment over the Internet.

Affordable and convenient, these services have won over many television fans who prefer them to the limited offerings on Mediacorp's free-to-air channels and the cumbersome subscription packages offered by pay-TV operators StarHub and Singtel. Telcos like StarHub and Singtel had seen a significant drop in the number of its Pay-TV subscribers last year.

But the older players have not lost the battle yet. If convenience is what the cord-cutters want, then convenience is what StarHub, Singtel and Mediacorp have given them. StarHub has introduced StarHub Go, which is an on-demand streaming service with Netflix-like pricing: Viewers use an app or go online to access a wide variety of content by paying a monthly fee from \$9.90 a month. Singtel offers a service called Cast, which has different plans starting at \$4.90 a month for different content bundles. As these online-TV services do not require set-top boxes, consumers do not have to pay rent for the hardware rented from StarHub or Singtel.

No less important to viewers is quality content. No one wants to watch rubbish on their phones even if it is for free. Some TV viewers continue their Singtel and StarHub cable TV subscriptions because many channels, such as those run by Fox Networks Group, are currently available only through these two telcos. Also, both StarHub and Singtel have been producing their own programmes. Pay-TV channels, too, have to produce strong content to remain relevant.

Source: The Straits Times, January 2017

Extract 3: Telco Wars Set to Intensify

The telco industry is ending 2017 with the worrying prospect of a tougher new year. The frantic jostling for market share that marked this year can only intensify as new candidates square off for battle. Australian start-up Zero Mobile elbowed its way into the Singapore market as a mobile virtual network operator (MVNO³) this month. Fibre broadband company MyRepublic plans to make the leap to MVNO next year. And Australia's TPG Telecom is due to enter with its own mobile network. These moves will follow a year that saw the expansion of MyRepublic and MVNO CirclesLife.

And new entrants come prepared for a price war the incumbents can ill afford. Incumbents have worked to address the challenge. StarHub partnered Netflix last year to bring the service to set-top boxes and high-definition streaming.

But DBS' Mr Mittal says: "With the emergence of OTT TV services and entry of Netflix in 2016, nearly 89,000 subscribers have withdrawn from pay TV services in Singapore. We believe subscriber losses would continue in 2018, as higher-end subscribers, who may have been using OTT and pay TV services simultaneously, start exiting pay TV services due to the lack of perceived benefits."

OCBC's Mr Chua notes: "The most obvious route so far is diversifying away from the traditional telco space - that is, voice and data services - towards providing enterprise digital solutions and related services." And incumbents have already made a play for the enterprise segment, in areas such as cyber security, digital advertising and data analytics. Mr Chua adds: "For instance, Singtel has close to 50 per cent market share in Singapore and this means it has access to the usage patterns and data of all its users. Businesses would want such data analytics to conduct more targeted marketing and advertising activities to optimise each marketing dollar."

Source: Straits Times, December 2017

³ A MVNO is a wireless communication services provider that does not own the wireless infrastructure over which it provides its services to customers. It obtains bulk access to network services from network operators at wholesale rates and sets retail prices independently.

Extract 4: Old Is Gold

Going to the cinema would be a thing of the past, some said, when Netflix and iTunes showed up. The Department of Statistics' latest figures showed a 10.4% dip in cinema attendance in the first part of this year, compared with last year.

While less tickets were sold in 2015, a revenue of \$216 million was still made, as compared to the \$201 million made in 2016 even though slightly more tickets were sold that year. The silver lining for the cinema business is this: More tickets sold does not mean higher box-office earnings.

In 2015, more people seem to have paid for more expensive weekend, Imax and 3D tickets for the two massive hits that year: Jurassic World and Star Wars: The Force Awakens. What this proves is that the widening price difference between ticket types (weekend, 3D, Imax, Gold Class and the like) will weaken the link between cinema attendance and box-office receipts.

In other words, cinemas might make money even as ticket sales drop because the group of people buying premium tickets is influential. An older crowd can spend more, on premium tickets. So don't write off cinema yet. To paraphrase the line in *The Godfather* (1972): Just when you thought you were out, they pull you back in.

Source: *Straits Times*, June 2017

Figure 2: Movie Ticket Prices at Golden Village Cinema (SGD)

	Weekday	Weekend
Adult	\$9.50	\$13
Student	\$7	\$13
Gold Class	\$29	\$39

Source: *Seedly*, March 2018

Questions

- (a) (i) From Table 1, identify the country with the highest projected growth rate in online TV revenue. [1]
- (ii) With reference to Figure 1 and use of a relevant elasticity of demand concept, account for your answer in (a)(i). [3]
- (b) With the aid of a diagram, account for the rise in OTT TV services. [5]
- (c) Discuss how an incumbent telco firm should respond to the challenges mentioned in the case. [10]
- (d) (i) Define cross elasticity of demand. [1]
- (ii) Account for the likely CED value between OTT TV and cinema movies. [2]
- (e) Discuss whether the pricing strategy of cinema operators is a case of price discrimination. [8]

[30 marks]

Optional Case Study Question 4: Anti-competitive behaviour in Singapore

Extract 1: Data on Singapore's consumption of meat

Table 1 shows Singapore's consumption of selected meats over a 12-year period.

Table 1: Consumption of selected meats in Singapore, 2007–2018 (thousand tons)

Meats	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Chicken	181	191	194	199	207	218	212	213	224	243	222	225
Beef	28	27	18	31	33	34	34	37	36	30	33	35
Pork	114	109	113	122	114	123	114	127	128	134	134	134

Source: United States Dept of Agriculture quoted in Index Mundi

Extract 2: The Competition and Consumer Commission of Singapore (CCCS) penalises fresh chicken distributors for price-fixing and anti-competitive agreements

The CCCS has today issued an Infringement Decision against 13 fresh chicken distributors for engaging in anti-competitive agreements to coordinate the amount and timing of price increases, and agreeing not to compete for each other's customers in the market for fresh chicken products in Singapore.

Fresh chicken distributors import live chickens from farms in Malaysia and slaughter them in Singapore. They then sell the fresh chicken products to customers such as supermarkets, restaurants, hotels, wet market stalls and hawker stalls. These products include whole fresh chickens, chicken portions and processed chicken.

Chicken is the most consumed meat in Singapore – more than 30kg of chicken is consumed per person annually. This is significantly higher than the per person consumption of other types of meats such as pork and beef. In 2016, approximately 49 million live chickens were slaughtered in Singapore. The total turnover of the 13 fresh chicken distributors, who collectively supply more than 90% of fresh chicken products in Singapore, amounts to approximately S\$500 million annually. The average price of fresh whole chicken sold in supermarkets increased from S\$4.96 per kg in 2007 to S\$6.14 in 2014, according to figures from the Singapore Department of Statistics. In 2017, the average price had risen to S\$6.58.

In March 2014, the CCCS commenced its investigation into the fresh chicken distribution industry. It revealed that, from at least September 2007 to August 2014, these distributors had engaged in discussions on prices and had also coordinated the amount and timing of price increases of certain fresh chicken products sold in Singapore. During these discussions, they had also agreed to 'market sharing' so they would not compete for each other's customers.

This collusion restricted supply in the market and contributed to price increases of certain fresh chicken products. The CCCS found that for at least seven years, between September 2007 and August 2014, the price of fresh chicken sold to supermarkets and hawker stalls had increased by between 10 and 30 cents each year. By agreeing not to compete for each other's customers, the distributors restricted the choices available to customers. The coordinated price increases further reduced customer choice as they limited options for customers to switch to more competitive distributors.

In view of the high combined market share of the 13 fresh chicken distributors, and as chicken is the most commonly consumed meat in Singapore, this anti-competitive conduct impacted upon a large number of consumers.

In deciding to levy fines, the CCCS has taken into account the relevant sales turnovers of each of the 13 firms and the nature, duration and seriousness of the infringement. The large size of this industry, the combined market share of the firms and the seriousness and the long duration of the firms' conduct contributed to the CCCS imposing the highest total fine of S\$26.9 million in a single case to date.

In addition to the fines, the CCCS has directed the 13 chicken distributors to provide a written commitment that they will stop using The Poultry Merchants' Association, of which they are all members, for future anti-competitive activities.

The Chief Executive of the CCCS said, 'Price-fixing and market sharing are considered some of the most harmful types of anti-competitive behaviour. Such conduct is particularly harmful when the products affected are widely consumed in Singapore, as in this case. The CCCS will continue to take strong enforcement action to ensure that anti-competitive practices do not negatively impact upon Singapore markets and harm businesses and consumers.'

Source: CCCS Media release, 12 September 2018

Extract 3: More disruptions in store for the taxi industry in 2018

In Singapore the ride-hailing travel market includes taxi drivers and drivers of private hire vehicles. Many drivers of private hire vehicles have exclusivity arrangements with companies, such as Uber and Grab, that use modern technology to aid bookings made by passengers. These exclusivity arrangements mean that contracted drivers can only take passengers that have booked through the company involved.

Today taxi drivers are facing increasing competition from drivers of private hire vehicles booked through operators such as Grab and Uber. Taxis rely on street hails but many passengers are now turning to the greater convenience and affordability of private hire vehicles. Only 69 taxi driver licences were issued in October 2017 – a historic low – and there were fewer than 24 000 taxis on Singapore's roads, the lowest number for ten years. In July 2011, before the market entry of Grab and Uber, 555 taxi licences were issued, the highest ever.

Source: Alfred Chua, Todayonline, 27 December 2017

Singapore slapped ride-hailing firms Grab and Uber with fines and finalised restrictions to open up the market to competitors after concluding that their merger in March 2018 has driven up prices and reduced competition in the ride-hailing market.

Fining Uber S\$6.8 million and Grab S\$6.4 million, the CCCS said effective fares on Grab rose 10% to 15% after the merger, and that the combined firm now holds a Singapore market share of around 80%. While the combined S\$13 million fine was small compared with the value of the firms, which is in multi-billions of dollars, and is unlikely to have a large impact on their profits, the measures imposed by the CCCS represent the strongest punishment by a regulator since the deal was unveiled. The competition watchdog also said it would require that Grab and Uber's exclusivity arrangements should be ended to allow drivers the flexibility to drive for more than one ride-hailing firm. This will help open up the market to new firms. However, the CCCS stopped short of ruling that the merger had to be reversed.

Uber said it believed CCCS's decision was based on an 'inappropriately narrow definition of the market' which did not reflect the competition between the merged company and other forms of land transport, and would consider appealing against the decision. Grab said it did not intentionally or negligently breach competition laws and claimed that it had not raised fares since the deal, arguing that all transport firms, including taxi operators, should be subjected to exclusivity curbs. However, the firm added that it would abide by the measures set out by the regulator.

Other possible new entrants to the ride-hailing market include Singapore-based Ryde and Indonesia's Go-Jek. Go-Jek plans to launch services in Singapore and said it welcomed the CCCS's steps: 'We're encouraged to see the measures being taken to level the playing field – it will have a significant effect on our strategy and timeline,' the company said.

The CCCS said it would suspend the measures on an interim basis if a new rival firm was able to get over 30% of the total rides in the ride-hailing market in a month. It would remove the measures altogether if a rival attained 30% or more of total rides in the market for six consecutive months.

Source: Aradhana Aravindan, Reuters, 24 September 2018

- (a) Explain one measure used by economists to assess the level of competition in an industry. [2]
- (b) Using Table 1, explain two possible changes in the market for pork that could account for the difference in the consumption of pork in 2018 compared to 2007. [4]
- (c) (i) What is meant by 'producer surplus' and 'consumer surplus'? [2]
(ii) Extract 2 states that 'collusion restricted supply in the market and contributed to price increases of certain fresh chicken products'.
Using a diagram, explain how this collusion is likely to have affected the producer surplus and the consumer surplus in the market for these chicken products. [4]
- (d) Using Extracts 3 and 4, discuss which market structure best describes the characteristics of the ride-hailing market in Singapore. [8]
- (e) Discuss whether the fines imposed by the CCCS are the best way to improve the outcomes for consumers in both the chicken product market and the ride-hailing market. [10]

[Total: 30]

Section C: Essay Questions

1. Bigger is better, or so it seemed to supermarkets all over the world over the last 30 years. Size seemed to offer all kinds of advantages, from cost advantages to offering a wider range of goods and services.
(a) Explain why supermarkets may enjoy lower costs. [10]
(b) In view of the benefits of large scale production, discuss the survival of small grocery shops. [15]
2. 'Recessions put weak firms out of business whilst strong firms use a recession to become more efficient'.
(a) Explain the relevance of different types of cost in the decision of a firm to close when faced by a fall in demand for its products. [10]
(b) Discuss the extent to which firms faced by high levels of competition are more vulnerable to closure in a recession than firms in less competitive industries. [15]
3. Retailers in Singapore supply a wide range of services and products in a variety of market structures.
(a) Explain the key differences between oligopolistic competition and monopolistic competition. [10]
(b) Consider different retailers in Singapore and discuss which of these two market structures best explain their market behavior. [15]
4. In the UK, train tickets may be obtained more cheaply if they are bought in advance. In August 2000 the railway companies jointly announced that these cheap tickets would be available only at major stations. Passengers living near smaller stations would, therefore, have to pay the full cost of the ticket.
(a) Explain what is meant by price discrimination and discuss whether this is an example of price discrimination. [10]
(b) Identify the type of market structure that enables companies to practice price discrimination, and discuss whether that market structure is ever beneficial to consumers. [15]

Optional Questions:

1. (a) Explain how, in economic theory, a monopolist would determine the price that would maximize profits. [10]
(b) Discuss whether firms in the real world set prices at profit maximizing levels [15]
2. 'With over 15000 hawker stalls all over Singapore, dining at hawker centers has become part of the Singapore identity.'
(a) Identify and explain the type of market structure which is likely to exist in the hawker food industry in Singapore. [10]
(b) Discuss whether such a market structure is ever beneficial to society? [15]

3. The Government has introduced greater contestability in the bus service industry. Competition for the market where operators compete periodically for the right to operate the bus services will spur operators to fulfil service obligations or risk being replaced when their term is up. The Government will also own all bus infrastructure, such as depots, buses and the fleet management system.

Source: Ministry of Transport (Singapore)

- (a) Explain the factors a potential entrant would consider when deciding to contest a market [10]
(b) Discuss the consequences of the above measures on commuters and bus service operators. [15]

Section E: Further Reading

<u>Article 1: More options for Hub ticketing, please</u> http://www.todayonline.com/sports/more-options-hub-ticketing-please	
<u>Article 2: The Big Read: Why the Grab-Uber deal is making some uneasy</u> https://www.channelnewsasia.com/news/asia/why-grab-uber-merger-deal-makes-passengers-drivers-uneasy-10120830	
<u>Article 3: Electricity market to be fully liberalised in 2018</u> http://www.straitstimes.com/singapore/electricity-market-to-be-fully-liberalised-in-2018	
<u>Article 4: CCCS and Competition Act</u> https://www.cccs.gov.sg/about-cccs/what-we-do	
<u>Article 5: Diamonds Are Not Rare, They Are Just Expensive De beers Diamond Marketing Strategy</u> https://www.feedough.com/diamond-marketing-de-beers/	