**Catholic Junior College
H2 Economics (9570)
THEME 2: MARKETS**

2.2 Firms and Decisions

**2.2.1 Objective of Firms
2.2.2 Cost and Revenue
2.2.3 Firms' Decisions and Strategies**

Unit Summary

The first topic (the Central Economic Problem) presented the basic economic problem of scarcity and its implications, primarily the need to make choices (decisions) and, consequently, the opportunity cost incurred. In the second topic (Price Mechanism and Its Applications), we examined how resources were allocated through the price mechanism where both producers and consumers interact in the market. In this topic on Firms and Decisions, we will examine how rational producers (firms) make decisions based on their objectives.

The traditional theory of supply or theory of the firm assumes that firms aim to maximise profit. Based on firms' understanding of their cost and revenue conditions, firms can make certain pricing and production/marketing decisions to maximize profits.

However, in the real world, firms may not have accurate information regarding their revenue and costs, and this makes profit maximisation difficult to achieve. Additionally, firms may not always seek to maximise profits but may have other objectives such as to maximise sales revenue. There may even be conflicts between the objectives of owners of the firm and the managers running it. Ultimately, a firm's behaviour depends on the objectives it wants to achieve.

Firms and Decisions (H2 Economics/ 9570)

CONTENT

REFERENCES:
1. SLOMAN, 8th Ed, Economics, Chapter 5
2. MCEACHERN, 7th Ed, Economics A Contemporary Introduction, Chapter 7

Firms and Decisions (H2 Economics/ 9570)

SYLLABUS KEY REQUIREMENTS

Check that you have mastered the following:

Theme 2.2 Firms and Decisions	
Economics Content	✔

2.2.1 Objectives of Firms
 	
a. Firms aim to maximise profits
    • Profit as the difference between total revenue and total cost
    • Profit-maximising output occurs at the point when marginal revenue (MR) equals marginal cost (MC) and where MC is rising
 	
b. Firms may choose to pursue alternative objectives such as revenue maximisation, profit satisficing and market share dominance
 	
c. Firms may lack sufficient or accurate information to make price and output decisions to maximise profits.	

2.2.2 Cost and Revenue a. Firms' cost and revenue concepts in the short run and long run b. Internal and external economies and diseconomies of scale and their link to the long-run average cost of production	

2.2.3 Firms' Decisions and Strategies
 	
a. An awareness that economists generally classify the four market structures (perfect competition, monopolistic competition, oligopoly, monopoly) based on characteristics such as number and size of firms, barriers to entry and nature of product is required.
 	
b. Firms make decisions and engage in pricing, cost and product differentiation strategies aimed at raising revenue and/or lowering unit costs. These include:
    • Growth, diversification and shut-down
    • Price competition
    • Third degree price discrimination
    • Innovation, research and development
    • Marketing
    • Collusion with other firms
 	
c. Firms consider the existing and potential levels of competition in the industry when making decisions and engaging in strategies
 	
d. An awareness that firms may:
    • Apply knowledge of consumers' cognitive biases (sunk cost fallacy, loss aversion or salience bias) in their strategies
    • Be affected by technological disruptions in the industry
    • Consider social and environmental concerns in their decisions
 	
e. Impact of firms' decisions and strategies on:
    • Efficiency (Productive, Allocative and Dynamic efficiency – P.A.D)
    • Consumer welfare (consumer choice, product quality and consumer surplus) other firms (cost, revenue and profit)	

Firms and Decisions (H2 Economics/ 9570)

Concepts and Tools of Analysis	
- Profit maximisation condition: MR=MC, where MC is rising - Revenue maximisation, profit satisficing, market share dominance - Total cost, average cost, marginal cost - Total revenue, average revenue, marginal revenue - Internal and external economies and diseconomies of scale - Third degree price discrimination - Shut-down condition - Product differentiation - Barriers to entry - Competition versus collusion - Efficiency - Productive, Allocative and Dynamic efficiency (P.A.D) - Consumer welfare	

1. Introduction

Before looking at how firms make decisions, let us examine what production is and how production units are organised.

(a) Production

> **Definition:**
>
> ***Production*** is the process of using *resources* (also known as *Factors of Production* (FOP) – CELL: Capital, Entrepreneurship, Land and Labour) to produce goods or services.

The production process ends when the output is sold, i.e. distribution (such as wholesale and retail trade) is also considered to be part of the production process. Production ends with consumption.

(b) Industry, Firm and Plant
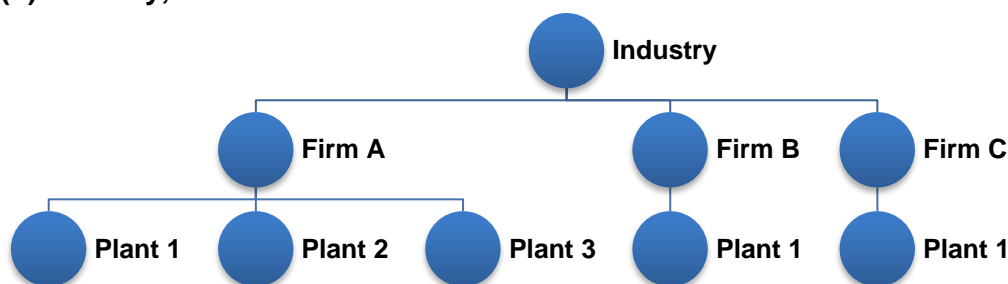
An industry is made up of firms producing similar goods and services.
- For example, (i) the automobile industry comprising Ferrari and Porsche (ii) the fast-food industry in Singapore, comprising McDonald's, Burger King and Kentucky Fried Chicken.

A firm is a decision-making unit by the entrepreneur who combines and organises the factors of production – land, labour, capital to produce a good or service.
- Examples of pharmaceutical firms: Pfizer, Novartis and GlaxoSmithKline.

A **plant** is a collection of factors of production at a particular location where production takes place.
- A firm can own and operate more than one plant. For manufacturing, it is typically the factory. For services, it could be the retail outlet or even the office itself.

2.   Production and Costs

In the process of production, firms incur costs.

Definition: ***Costs*** are defined as expenses (e.g. labour and raw material costs) incurred by a firm in the production of goods and services.
Note: - "Costs" in economics typically refer to the cost of production by firms. Students should not confuse 'costs' with 'price'. - 'Price' typically refers to the equilibrium price per unit producers charge consumers for a good and/or service in a market.

2.1   Factors of production

Firms use factors of production as inputs to produce goods and services. These factors of production could be **fixed** or **variable**.

	Fixed Factors	Variable Factors
Definition	**Fixed factors** are factors of production that **cannot** be increased within a given time period.	**Variable factors** are factors of production that **can** be increased within a given time period.
Examples	Land, factories, shop space, and machines	Labour and raw materials
Implication for firms	Firms cannot increase the amount of land or the size of the factories in the immediate time period.	Firms can quickly increase labour supply by employing workers to work overtime.
The difference between fixed and variable factors allows us to distinguish between time periods in production, the **short run** and **long run**.		

Self-Assessment 1 Suppose a garment manufacturer incur the following costs. State whether you consider each to be a ***fixed or variable cost*** over a six-month period: Cost of a new advertising campaign for goods produced…fixed / variable costs* Cost of cloth used in apparel production……………….......fixed / variable costs* Salary of a chef on a two-year contract………………….....fixed / variable costs* Wages paid to production workers ………… ………………fixed / variable costs* Rent of factory space ……………………………………fixed / variable costs* *Cancel where appropriate

2.2   Time Period

There are mainly two time periods in production: short run and long run.

	Short Run	**Long Run**
Definition	Short run is a time period in which there is *at least one fixed factor*.	Long run is a time period where *all* the factors of production are *variable*.
Implication for firms	<u>In the short run</u>, if the firm wants to increase output, it will only be able to increase the number of certain inputs, e.g. labour and raw materials. These are known as *variable factors*. The firm will have to make do with its existing buildings and most of its machinery, which are *fixed factors*. Therefore, firms can only increase output by using more variable factors in the short run.	<u>In the long run</u>, the time period is long enough for all inputs to be varied, i.e. there are *no fixed factors*. The firm may vary all factors of production to change the output. Different firms will have different long run periods. As long as all the factors can be varied, the firm operates in the long run.

The distinction between short run and long run is illustrated in the following example. Suppose an aircraft manufacturer wants to produce more planes:
- In the short run, the aircraft manufacturer can only increase output by hiring more workers (variable factor) or making its existing workers work longer hours.
- It is not able to build a new hangar (capital - a fixed factor) to increase the production of aircraft since it takes time to build a new hangar.
- Therefore, the short-run period would be from now until the firm builds a new hangar.
    1. If it takes 2 years to build a new hangar, the short run period for the firm will be 2 years (as there is at least one factor of production, the hangar, which is fixed during this period).
    2. The long run time period is from the 2nd year onwards as all factors of production are now variable.

Self-Assessment 2:

The actual length of the short run is different for different firms. It does not correspond to a fixed period of time. For example, the short run for a bakery may be shorter than the short run for a power station. Can you explain why?

3. Short Run Production Costs

3.1 Introduction to Short Run Production Costs

As explained earlier, in the short run, some factors of production are *fixed* while others are *variable*. Hence, in the short run, a firm's total cost of production consists of fixed **and** variable costs.

3.2 Costs of Production in the Short Run

> **Definition:**
>
> **Total Fixed Costs (TFC)** refer to costs that do <u>not</u> vary with output.

It is incurred in the use of fixed factors of production. Total fixed cost remains the same even when output increases.

Examples of fixed costs include: cost of heavy machinery, shop rental, advertising, research and development for new products, depreciation on plant and equipment due to wear and tear, and property taxes.

> **Note:**
> In the short run, even if a firm's output is zero, the firm will still be incurring fixed cost, e.g. rental costs.

> **Definition:**
>
> **Total Variable Costs (TVC)** refer to costs that <u>vary</u> directly with output.

It is incurred in the use of variable factors of production. If the output is zero, the variable cost would be zero. As output rises, more of such factors are used and hence the higher the total variable cost.

Examples of variable costs are raw materials and component parts, the wages of part-time employees paid by the hour and the costs of electricity and gas to maintain production.

Total Costs (TC) in the short run is the sum of the total fixed cost and the total variable cost.

> Total Cost (TC) = Total Fixed Cost (TFC) + Total Variable Cost (TVC)

It is important to note that besides total costs, firms also consider average and marginal costs.

Average Fixed Cost (AFC) is the total fixed cost per unit of output.

> AFC = TFC / Q

Since TFC does not vary with output, the total fixed cost is spread over a greater output when more output is produced. This causes the average fixed cost to fall continuously as output increases. With reference to **Figure 1**, AFC falls continuously as output rises because total fixed costs (which are constant) are spread over the greater output.

For example, when the TFC of a firm is $1000 and it only produces one unit, its AFC is $1000/1= $1000. However, if it produces 1000 units, its AFC is now $1000/1000=$1. Therefore, AFC falls continuously as output rises.

Average Variable Cost (AVC) is the total variable cost per unit of output.

$$AVC = TVC / Q$$

With reference to **Figure 1,** the short run AVC curve takes on a U-shape. When variable factors are first combined with fixed factors, total output, Q, increases by a greater proportion than the TVC. Therefore, the AVC falls. This continues until a particular output is reached, after which, additional variable factors added will cause TVC to increase by a greater proportion than total output and hence, AVC rises.

Average Costs (AC), also called **Average Total Costs (ATC),** is the cost per unit of output. It is calculated as follows: Total costs (TC) divided by the total output (Q). With reference to **Figure 1**, it is also U-shaped due to the nature of the AVC, which is a part of ATC.

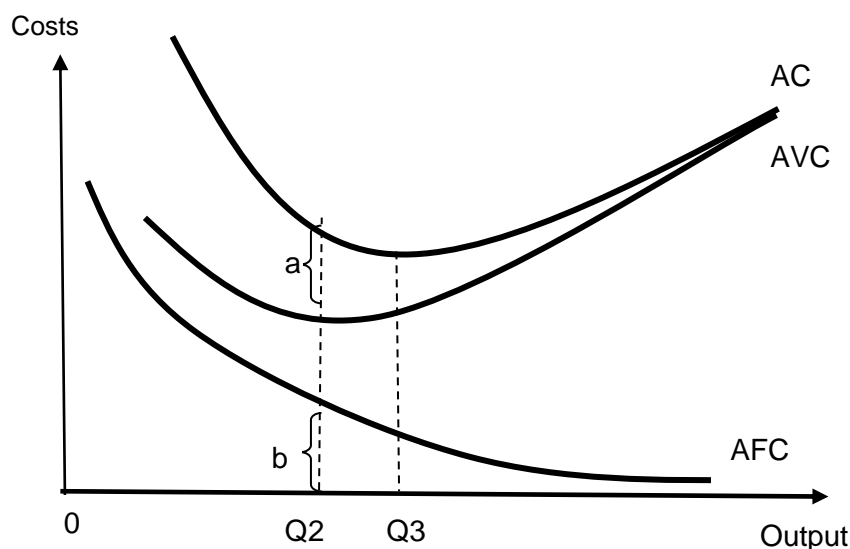|		
AC = TC / Q	**Or**	$AC = \dfrac{TFC + TVC}{Q}$ = TFC/Q + TVC /Q = AFC + AVC where AFC is the average fixed cost and AVC is the average variable cost.

Figure 1: Average Cost Curves in the Short Run

Explanation of shape of AFC, AVC and AC in **Figure 1**:

● AC = AFC + AVC. As output increases, AVC initially falls and then reaches a minimum, after which it rises. AFC falls continuously as output rises.

● From output 0 to Q2, both AFC and AVC are falling, so AC must be falling.

● From Q2 to Q3, while AVC starts to rise, AFC is falling faster than the rising AVC, so AC still falls.

● From Q3 onwards, AVC rises faster than the falling AFC, so AC rises. The minimum point of the AC curve occurs to the right of the minimum point of the AVC curve.

● Since AC = AFC + AVC, this implies that AFC = AC – AVC. Hence the gap between AC and AVC represents the AFC. In Figure 1, the distance 'a' is the same as distance 'b' as both of them represent the AFC that corresponds to output Q2.

● Since AFC falls as output increases, the gap between AC and AVC narrows as output increases.

Marginal Cost (MC) refers to the additional cost of producing <u>one more unit of output</u>. The sum of the marginal costs gives the total variable cost.

$$\text{Marginal Cost (MC)} = \frac{\Delta TC}{\Delta Q}$$

If a firm increases production from 10 to 11 units and as a result total cost rises from \$30 to \$45. \$15 is the extra cost incurred to produce the 11th unit. So, the marginal cost of the 11th unit of output is \$15.

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{\$45 - \$30}{11 - 10} = \$15$$

The MC curve takes on a U-shape, i.e. falling initially, reaches a minimum, and then rises as shown in Figure 2.

Below is an example to illustrate what happens when additional units of variable factors are combined with fixed factors to explain the shape of the MC curve (this is a simplified exemplification of the Law of Diminishing Marginal Returns[1]).

Example:
Suppose a bubble tea shop has recently opened.

Phase 1 (MC falls): Originally, with only one worker working, this shop (fixed factor) is under-utilised. The boss may start hiring more workers (variable factors).

- From the 1st to the 4th worker, each additional worker can increase output per hour (i.e. productivity) because they can specialise in specific duties. E.g. one worker can specialise in only preparing the toppings and brew the tea, and another two can mix the drinks, another one serves orders to customers etc.
- They can efficiently use the fixed factors, i.e. the bubble tea sealing machine and shop.
- While the boss has to pay more in wages (i.e. increase in TVC) to hire these workers, the workers are so productive in producing more bubble tea that total output increases more than the TVC. That is, the additional worker adds more to the total output of the bubble tea than to the total cost.
- Therefore, MC (i.e. cost of producing an additional unit of output), which is derived from $\Delta TVC/\Delta Q$, falls.

Phase 2 (MC rises): When more and more workers are added beyond 4 workers, the scope for further specialisation diminishes, e.g. all the workers are already specialising in specific duties as much as possible.

- There is now not enough of the fixed factor to be combined with the variable factor, e.g. the shop is too small to accommodate an increase in the number of workers or there continues only to be one cup-sealing machine to be shared by all the workers.
- The 5th and 6th workers contribute a *smaller amount* to the overall output because they start getting in each other's way or wait to use the cup-sealing machine. However, they are still paid the *same wages* as the first 4 workers.
- In this phase, the increase in total variable cost to hire the additional workers is greater than the increase in output. That is, the output from the *additional* worker is less than the cost incurred to hire them.
- Therefore, MC, which is derived from $\Delta TVC/\Delta Q$, increases.

Note:
- Since MC = $\Delta TVC/\Delta Q$, all marginal costs are due to variable costs as fixed costs do not vary with output (where $\Delta TFC/\Delta Q = 0$).
- E.g. A rise in advertising costs/ rental/ research & development (R&D) will not affect MC, as these costs are considered fixed. However, a rise in wages (considered a variable cost) would affect MC.

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[1] Refer to Appendix A for more details on the law of diminishing marginal returns.

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Relationship between Marginal Cost, Average Variable Cost and Average Cost.
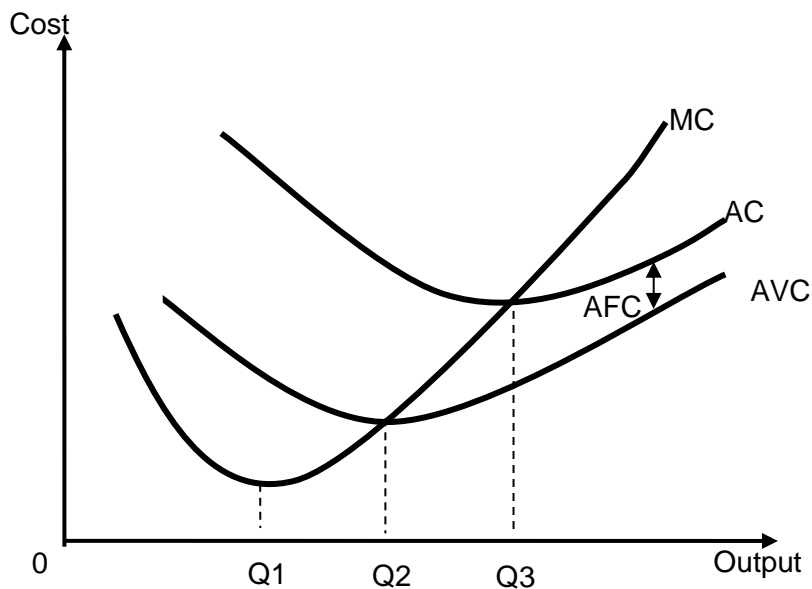
Figure 2: Short Run Cost Curves

With reference to **Figure 2**:

Output 0 to Q1
- MC falls until output Q1
- MC is below AVC and AC. Hence AVC and AC are also falling.

Output Q1 to Q2:
- MC is rising.
- However, MC is still below AVC and AC. Hence, AVC and AC continue to fall.

Output Q2 to Q3:
- MC is rising.
- MC is now above AVC. Hence AVC also rises.
- However, as MC is still below AC, AC continues to fall.

Output above Q3:
- MC is rising.
- MC is greater than both AC and AVC. Therefore, both AC and AVC rise.

Conclusion:

As shown in **Figure 2**, MC falls and then rises, i.e. it is 'U-shaped' due to the Law of Diminishing Marginal Returns (refer to Appendix A).

The rising portion of MC curve also cuts both the AVC and AC curves at their ***minimum points***. The distance between AC and AVC narrows as output increases to reflect the continuously falling AFC (where AC = AFC + AVC).

Important:
Students must ensure that MC intersects both the AVC and AC at their respective minimum points when drawing the diagram!

To see why this is so, consider the following example (optional):

Relationship between average and marginal (Reference: Sloman Box 5.3)
● Suppose there are 10 people in a room and the average age of these people is 20.
● If another 20-year-old enters the room (marginal age is 20), the average age of these 11 people remains as 20 (average age remains constant).
● If another 56-year-old enters the room (marginal age is 56), the average age of these 12 people becomes 23 (average age rises from 20 to 23).
● If another 10-year-old enters the room (marginal age is 10), the average age of these 13 people becomes 22. (average age falls from 23 to 22)

The three universal rules about averages and marginals:

(i)   If the marginal = the average, the average remains the same (i.e. the minimum point of the AC curve intersects MC curve).
(ii)   If the marginal > the average, the average rises (i.e. the upwards sloping portion of the AC curve).
(iii)   If the marginal < the average, the average falls (i.e. the downwards sloping portion of the AC curve).

Note to students:
• The above example on averages and marginals aims to help you understand why MC cuts AVC and AC at their respective minimum points.
• Most importantly, you just need to **ensure that you draw the curves accurately**, you are not required to explain the above universal rules.

Self-Assessment 3:
Suppose a firm's rent was doubled, but all other costs remain unchanged. What is the effect on the firm's MC and AC?

4. Long Run Production Costs

4.1 Introduction to Long Run Production Costs

Economists consider the long run to be a period where **all factors of production are variable**. Therefore, **a firm will only incur variable costs and not fixed costs in the long run**. A firm may expand its present factory, build new factories in different parts of the country, install new machines and even change its production methods in the long run.

Figure 3 shows the firm's Long Run Average Cost (LRAC) curve.

Note:
- The LRAC shows the lowest possible average cost of producing any given output level.
- From the firm's perspective, production at any point on the long run average cost (LRAC) curve is said to be *productive efficient* for the firm. This will be explained further in Section 9.1.

While its shape is similar to the Short Run Average Cost curve, the reason for the shape of the LRAC is different. The LRAC is shaped as such due to **internal economies and diseconomies of scale**.

4.2 Economies and Diseconomies of Scale

Definition:
Economies of scale are **cost savings** that a firm enjoys when it *increases its scale of production* or *when the whole industry expands*, leading to a decrease in the cost per unit of production (or average cost).

Economies of scale may be generated internally or externally.

Internal Economies of Scale	External Economies of Scale
If the average cost decreases due to the **increase in the scale of production *by the firm***, we say that the firm experiences *internal* economies of scale.	If average cost decreases due to the **expansion *of the industry*** and not the firm, we say that the firm experiences *external* economies of scale.

Definition:
Diseconomies of scale are **cost dis-savings** that a firm faces when it increases its scale of production or when the whole industry expands, leading to an increase in the cost per unit of production.

Diseconomies of scale may be generated internally or externally.

Internal Diseconomies of Scale	External Diseconomies of Scale
If the average cost increases due to the **increase in the scale of production *by the firm***, we say that the firm experiences *internal* diseconomies of scale.	If the average cost increases due to the **expansion *of the industry***, and not the firm, we say that the firm experiences *external* diseconomies of scale.

> **Important:**
>
> Economies of Scale and Diseconomies of Scale are *long run* cost concepts pertaining to **per unit** cost / **average** costs of production - NOT the total cost of production!

4.2.1   Internal Economies of Scale and Diseconomies of Scale

> **Definition:**
>
> ***Internal Economies of Scale (iEOS)*** are cost savings that a firm enjoys when it increases its scale of production, leading to a decrease in the <u>cost per unit of production</u>.

Internal economies of scale arise from the spreading-out of fixed costs, productivity improvements and greater buying power over inputs when a firm expands its production.

* **Graphical Illustration:** Internal economies of scale result in a *downward* movement along the LRAC curve (with reference to Figure 3).
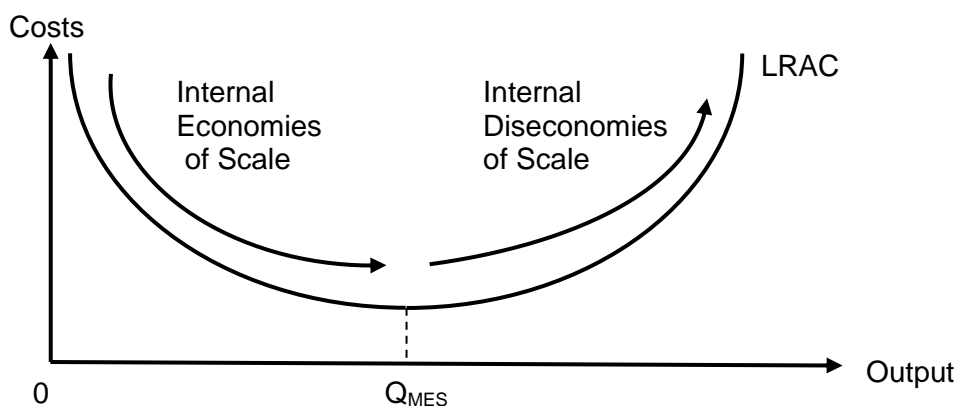
Figure 3: Internal Economies and Diseconomies of Scale

From Output 0 to Q$_{MES}$:
The LRAC usually is U-shaped as it is assumed that as the firm expands its output from 0 to Q$_{MES}$, it experiences falling unit costs arising from internal economies of scale (which is represented by a movement along the *downward* sloping portion of the LRAC curve).

Beyond Output Q$_{MES}$:
However, as output increases beyond Q$_{MES}$, the firm will incur rising unit costs resulting from internal diseconomies of scale (represented by a movement up along the *upward* sloping portion of the LRAC curve).

At Q$_{MES}$:
Output Q$_{MES}$ is known as the **Minimum Efficient Scale (MES)**. It is the point of production where the long run average cost of production is the lowest because no additional internal economies of scale can be achieved. (The concept of MES will be discussed further in **Section 4.4**)

Sources of Internal Economies of Scale

1. Technical Economies

Technical economies of scale are cost savings that arise due to the adjustments made to the production process as a result of a large scale of production.

a) Indivisibility of capital

Some capital equipment dramatically improves productivity, but they incur high initial costs and are indivisible. 'Indivisibility' means that an input cannot be scaled down below a certain minimum size to cater to a small output.

Heavy machinery and larger equipment tend to be indivisible, e.g. bottle capping machine, a car assembly line and a large printing press. All these are meant for mass production of large output and not for low output levels. Therefore, the higher the capacity that these machines are used for, the lower the cost of production per unit of output.

Assume a bottle capping machine costs $100,000, and it can produce up to 10,000 units per hour. This machine is economical for a larger firm producing 10,000 units per hour rather than a smaller firm producing 500 units per day. Therefore, the average cost of operating the machine is much lower for the larger firm compared to the smaller firm.

Another example would be network infrastructure.
- Many networks have huge potential for economies of scale. For instance, telcos like Singtel provide mobile networks and broadband services, and SP Group distributes electricity and gas to households and firms in Singapore.
- After incurring a high start-up cost to establish the networks, the marginal cost of adding another customer to the network is very low. These firms benefit from serving a larger number of users, which helps to lower the average costs.

b) Principle of increased dimensions

The larger the size of any capital equipment, such as containers, the lower the cost per unit of output. Since large containers have a bigger volume relative to the surface area than smaller containers, large containers tend to be more cost-effective (in terms of storage costs per unit of output) and can help reduce average costs for larger firms that can better utilise such containers.

A more significant increase in capacity for shipping companies means that the average cost of containing and transporting goods will fall as output increases. It is also crucial in warehousing and distribution, where a larger plot of land permits a much bigger warehouse than one built on a smaller field of land. In these industries, larger firms can therefore enjoy lower average costs.

2. Marketing Economies

Marketing economies arise from the buying of inputs in bulk. A larger firm is able to buy its material requirements in larger quantities. Bulk buying enables a large firm to have greater bargaining power than small firms. The large firm will be able to obtain inputs at a discount and hence enjoy lower average costs.

- An example would be the ability of the electricity generators to negotiate lower prices when negotiating coal and gas supply contracts.
- Major food retailers also have strong bargaining power when purchasing supplies from farmers and other suppliers.
- Additionally, a firm with a national market may advertise in the daily newspapers and promote its product to potential buyers in the country. Given a certain sum of advertising expenditure, the cost of advertising per unit of output is lower for a large firm that can spread the advertising cost over a larger output than a smaller firm spreading the advertising costs over a lower output.

3. Organisational Economies

a) Greater Degree of Specialisation

Larger firms can afford specialised departments and staff performing specific administrative operations, such as human resources, finance, sales, and marketing. Greater specialisation in the particular areas of expertise generally results in greater productivity, i.e. output per labour hour increases, and therefore average costs fall.

- For example, workers in smaller firms often have to multitask and perform diverse roles, and therefore, they tend to be less productive due to the lack of specialisation. In addition, they may take more time to complete each task as they are less familiar with each task.
- On the contrary, with specialisation and division of labour made possible in larger firms, less training may be required as workers become highly efficient in doing the specialised task.
- Increased efficiency means workers can produce more in a given time period than before, which reduces the average cost of production. Thus, larger firms may incur a lower average cost than smaller firms.

b) Greater spreading of management costs

Larger firms may also utilise managers to a fuller extent than smaller firms. A manager in a larger firm may be able to monitor as many as 15 workers, but in a smaller firm, s/he may not be able to monitor 8 workers. Therefore, the cost of hiring the manager is spread over a larger number of workers and output in a larger firm than the smaller firm, which leads to a lower average cost in hiring the supervisor.

4. Financial Economies

A large firm may enjoy cost savings when it obtains funds from banks. A large firm can get a lower interest rate on loans than a small firm because it is a more credit-worthy borrower as it has significant assets (e.g. buildings) to provide as collateral[2] against loan default. These help to lower the bank's risk of extending loans at lower interest rates to larger firms. As a result, a lower interest rate helps reduce the average costs of a large firm.

In contrast, smaller firms often face higher interest rates on loans because banks perceive it to be riskier to lend to smaller firms.

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[2] 'Collateral' is pledged as security for repayment to be forfeited ion the event of a loan default. This reduces the risk taken by the bank to provide substantial loans.

5. Risk-bearing Economies

Risk-bearing economies refer to the ability of firms to spread the uncertainty in the cost of production over a large level of output and thereby reduce average costs.

The returns of R&D are highly uncertain. Larger firms enjoy the cost advantage of spreading the risk of research and development (R&D). As a result, it is easier for larger firms to invest the significant resources needed to carry out extensive R&D.

- An example is a pharmaceutical industry, where there is an enormous cost to successfully produce new drugs. Therefore, pharmaceutical firms tend to merge and spread the R&D expenditure over a greater output to reduce the average cost of production.

Furthermore, producing a wider variety of products and operating in many geographical locations also help to spread risk and keep average costs lower. Raw materials may be obtained from many different sources. If the supply is cut from one source, the firm can turn to its alternative sources to not disrupt the supply chain. Diversifying products, markets and supply of inputs reduces business risks and indirectly reduces average costs.

- For example, the Covid-19 pandemic has led to lockdowns and hampered the ability of workers to work in manufacturing lines in some countries. These can cause the average costs of firms to increase. To reduce the over-reliance on one city, many firms operate factories across many countries to reduce business risks and average costs.

Summary Table for Sources of Internal EOS (FORM-T)	
F	**Financial economies**
O	**Organisational/ managerial economies**
R	**Risk-bearing economies**
M	**Marketing economies**
T	**Technical economies**

> **Definition:**
> ***Internal diseconomies of scale*** are cost dis-savings that a firm faces when it increases its scale of production, leading to an increase in the cost per unit of production.

Internal diseconomies of scale arise from the fall in productivity due to greater complexity and lower labour motivation, as well as the employment of more resources to manage such problems when a firm expands its production.

- **Graphical illustration:** Internal diseconomies of scale result in an *upward* movement along the LRAC curve *(with reference to Figure 3).*

Sources of Internal Diseconomies of Scale

1. Coordination problems

As the size of the firm grows, it becomes difficult to manage the firm in terms of coordination, control and communication. Processes in the firm become more complex and rigid, and the decision-making process is likely to be slower due to excessive red tape[3]. Consequently, the production of output could take a longer time, thereby increasing the average cost.

2. Fall in motivation

Workers in a large organisation sometimes suffer from low morale. They could feel alienated from the firm due to its size. Low morale inhibits labour productivity and contributes to a higher incidence of careless work and absenteeism. This could result in a higher cost per unit of output. In some countries, the production plants of a large firm may suffer from more labour disputes than small firms.

As a result of a fall in motivation among workers, a large firm might need to increase spending on people management due to the complex interrelationships among various departments of the firm.

3. Technical issues in the production process

With more complicated production processes for larger firms with greater output, holdups can occur if there is a disruption in any one part of the production line. For example, if a firm is producing mobile phones and there is a problem with one component part, production will have to cease, even though other aspects of production are working. This can then lead to an increase in average cost.

---

[3] 'Red tape' refers to excessive adherence to official rules and formalities or bureaucracy.

4.2.2 External Economies of Scale and Diseconomies of Scale

Definition:
External economies of scale are cost savings that a firm enjoys when the industry expands, leading to a decrease in the cost per unit of production.

Note:
Recall that an industry is made up of a number of firms which have something in common. For example, the car industry comprises firms producing cars and its components parts. Other examples of industries include the food industry, electronic industry, textile industry and plastic industry.

External economies of scale refer to the fall in the long run average costs of a firm as a result of the **expansion of the industry**. It arises from the sharing of common resources between firms and the outsourcing of production processes to supporting firms, due to industry expansion. In this case, the cost savings enjoyed by the firm are due to the increase in the size of the industry and not due to the firm's scale of production.

External economies of scale lower the long run average costs of the firms in the industry and this is shown by a downward shift of the whole LRAC curve of a firm from $LRAC_1$ to $LRAC_2$. **Figure 4** shows that the firm enjoys lower average costs at every unit of output.
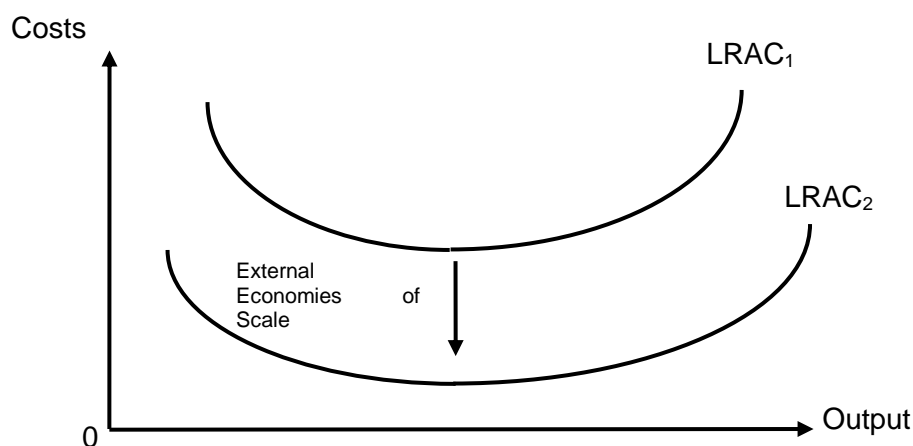

Figure 4: External Economies of Scale

Firms and Decisions (H2 Economics/ 9570)

Sources of External Economies of Scale:

1. Economies of Outsourcing

Outsourcing is the business practice of hiring a party outside a company to perform services or create goods that were traditionally performed in-house by the company's own employees and staff.

Outsourcing's biggest advantages are time and cost savings. A manufacturer of personal computers might buy internal components for its machines from other companies to save on production costs. A law firm might store and back up its files using a cloud-computing service provider, thus giving it access to digital technology without investing large amounts of money to actually own the technology.

Source: Investopedia

When an industry expands, there will be increasingly number outsourcing service providers to provide such services to firms in the industry. Firms can benefit by outsourcing functional services, such as accounting, human resources, marketing, treasury, legal, and information technology. Outsourcing such functions helps firms on the industry to reduce their average cost by saving on investments as it does not need to develop systems to perform such functions, e.g. legal functions. It can also save on hiring skilled people or training of their labour to perform such functions, e.g. accounting. These functions can be undertaken by external firms that have greater knowledge and experience in these fields.

2. Economies of concentration

When the industry is concentrated in a particular region and the industry expands, the government may want to improve the region's infrastructure. The government could improve road, rail and telecommunication services. Good transport and communication systems boost production and distribution by the industry. All firms in the expanding industry will enjoy lower average costs as a result.

Examples include Silicon Valley in California, US, where global tech firms congregate, and Biopolis (biomedical hub) and Fusionopolis (tech and engineering hub) in Singapore.

Sources of External Diseconomies of Scale:

Definition:
External diseconomies of scale are cost dis-savings that a firm faces when the industry expands, leading to an increase in the cost per unit of production.

When an industry expands, existing firms expand, and new firms enter the industry. Beyond a certain industry's size, external diseconomies of scale set in due to infrastructural bottlenecks and increased competition for common inputs due to industry expansion. External diseconomies of scale refer to the rise in the long run average cost of a firm due to the expansion of the industry's output.

The rise in the long run average cost is reflected by an upward shift of the LRAC curve from $LRAC_1$ to $LRAC_2$
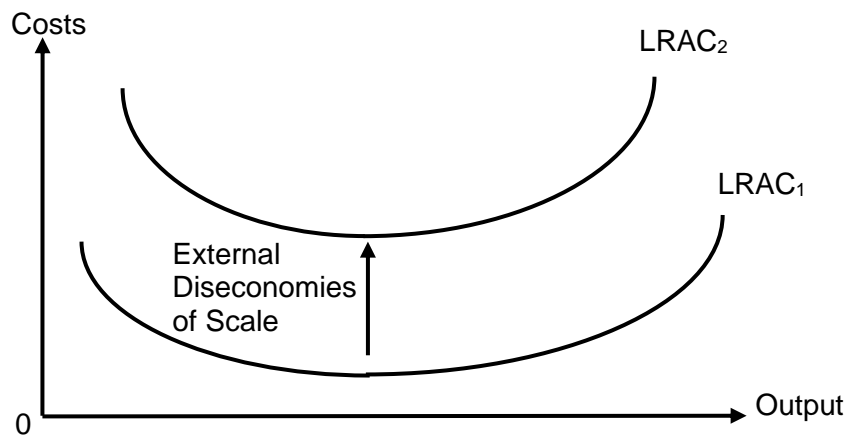

Figure 5: External Diseconomies of Scale

Sources of external diseconomies of scale:

1. As the industry increases its output, there will be increasing competing demands for materials, labour, land and transport. When the supply of the inputs cannot be increased as quickly to meet the rise in demand, input prices will rise, leading to an increase in the firm's cost. Hence, firms experience external diseconomies of scale. For example, as an industry grows larger, this may create a growing shortage of skilled labour. This will push up labour costs, and average costs for all firms in the industry will rise.

2. As an industry expands and is concentrated in a particular region, it may lead to traffic congestion, pushing up transport costs for all the firms in the industry.

4.3   Significance of Economies and Diseconomies of Scale

Internal economies of scale and diseconomies of scale are significant as they affect a firm's decisions in its long run planning, e.g. the level of output to produce.

● Where there are significant internal economies of scale to be reaped, the firm size is likely to be <u>larger</u> (e.g. oil refining firms and airlines). Such industries are likely to be dominated by a few large and dominant firms, each with significant market shares.

● Where internal diseconomies of scale set in early or internal economies of scale to be reaped are limited, the firm size is likely to be <u>smaller</u> (e.g. firms in retail trade and tailors). Such industries are likely to comprise many small firms, each with a small market share.

While external economies of scale do not influence the firm when planning the scale of production, they must be taken into account when deciding *where* production shall take place. This is because the savings in costs due to internal economies of scale may not outweigh any external diseconomies of scale that arise through traffic congestion and pollution.

4.4   Minimum Efficient Scale (MES)

Definition:
Minimum Efficient Scale is the lowest output at which the firm can produce at so that long-run average costs are minimised. It is represented by the lowest point on the long run average cost curve.

A firm at this scale will be operating at its optimum, as its average costs are the lowest possible. The diagram below illustrates the MES.
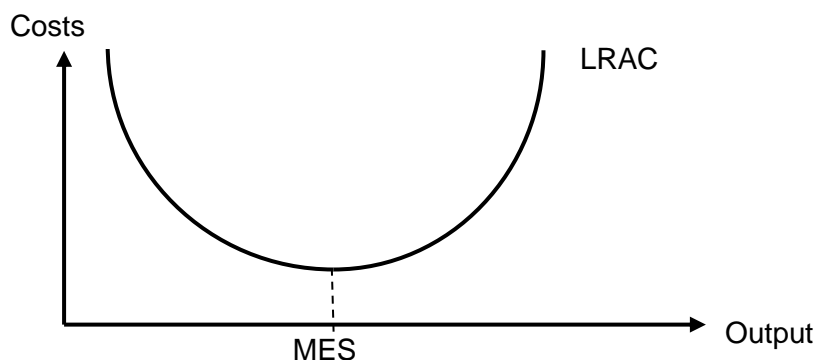
Figure 6: Minimum Efficient Scale

MES can be helpful in indicating the **size** and **number of firms** in the industry.
  ● If there is substantial scope to enjoy internal economies of scale (MES is large relative to market demand), then this industry will likely have a few large firms.
  ● If MES is small relative to market demand, it is likely that the industry has more small firms.
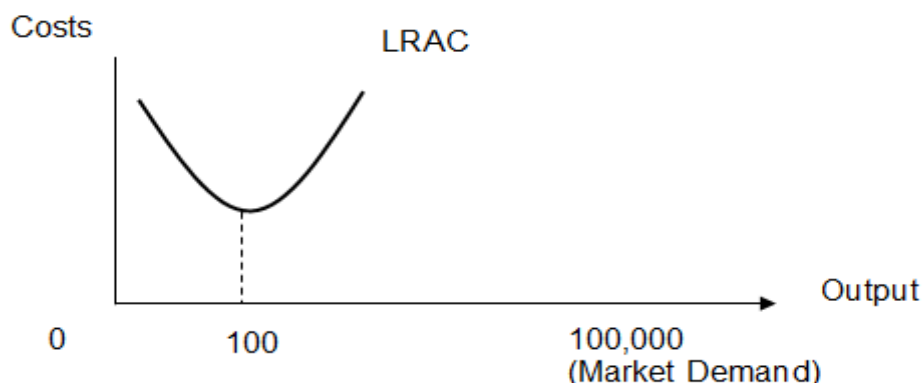
Figure 7: Small Firm

In **Figure 7**, the firm's MES occurs at a low level of output relative to the market demand, and unit cost rises quickly after that. With little internal economies of scale to be reaped, **such industries tend to be made up of numerous small producers**. Examples include many personal services like retailing of fashion apparel, hair dressing, laundry services and restaurants.

Cost
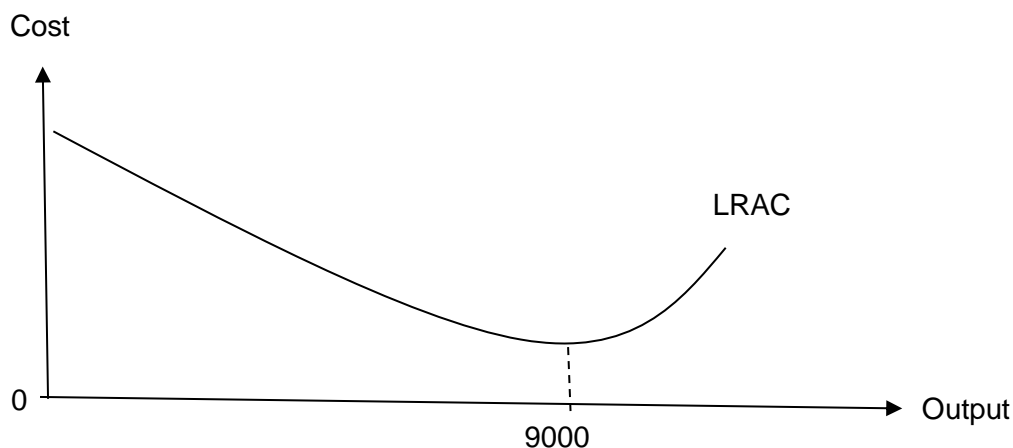
Figure 8: Large Firm

In **Figure 8**, MES occurs at a high output level relative to market demand. The firm in this industry experiences extensive internal economies of scale and diseconomies only set in at very high output levels.

**An industry with such an LRAC tends to be very concentrated, with only a small number of industrial giants competing with each other**. Typically, capital and technology-intensive sectors like pharmaceuticals, consumer electronics, utilities, mass transportation and banking are examples of such an industry.
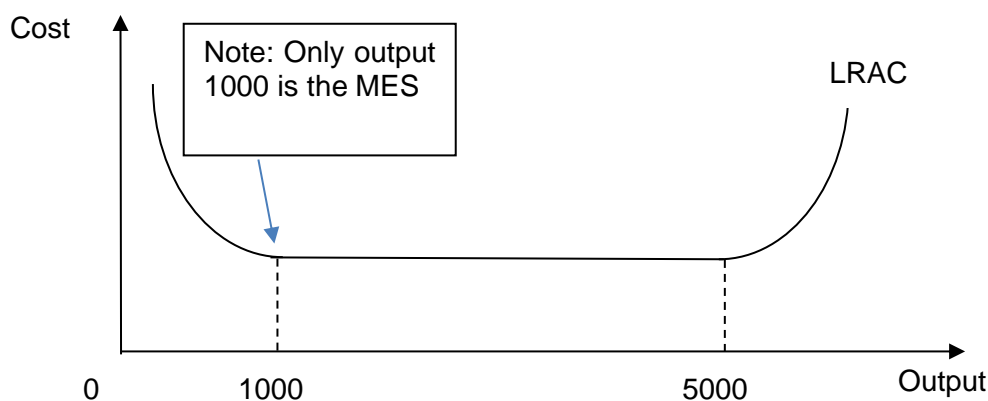
Figure 9: Co-existence of large and small firms

With reference to the LRAC in **Figure 9**, MES is achieved at 1000 units but the unit cost remains at the minimum up to 5000 units. Therefore, both large and small firms tend to co-exist in the industry as their cost competitiveness is similar.

You may observe large furniture retailers like Courts and smaller furniture stores in the neighbourhoods in the real world. Both these large and small furniture firms can compete with one another in terms of costs effectively.

Firms and Decisions (H2 Economics/ 9570)

Self-Assessment 5:
Distinguish between internal economies of scale and external economies of scale.

Criteria	Internal EOS	External EOS
Definition		
Sources of EOS		
Diagrammatic illustration		

5. Revenue

Definition:
Total Revenue of a firm is the total amount of money received by a firm from the sale of a given level of output (per time period)**.**

When all the output is sold to all consumers at the same price, total revenue is calculated by price of the good multiplied by the quantity sold.

Total Revenue (TR) = Price (P) x Quantity (Q)

Average Revenue is the amount of money that a firm receives per unit of output sold over a given time period. If all the output is sold at the same price, average revenue will be the same as the price of the good.

Average Revenue (AR) = $\dfrac{TR}{Q}$ = Price (P)

Marginal Revenue is the <u>additional</u> revenue gained by selling *one more* unit of output per period of time.

Marginal Revenue (MR) = $\dfrac{\Delta TR}{\Delta Q}$

Diagrammatic Analysis of the Average Revenue (AR) and Marginal Revenue (MR) of a Price-setting Firm[4]

(i) The demand curve of the price-setting firm is downward sloping

According to the Law of Demand, quantity demanded and price are inversely related. Hence, the price-setting firm faces a trade-off between price and quantity – it has to reduce the price if it wants to sell more or accept lower output if it wants to raise the price. Therefore, the price-setting firm **cannot control both price and quantity, but either price OR quantity.** Therefore, a price-setting firm faces a downward-sloping demand curve (**Figure 10**).
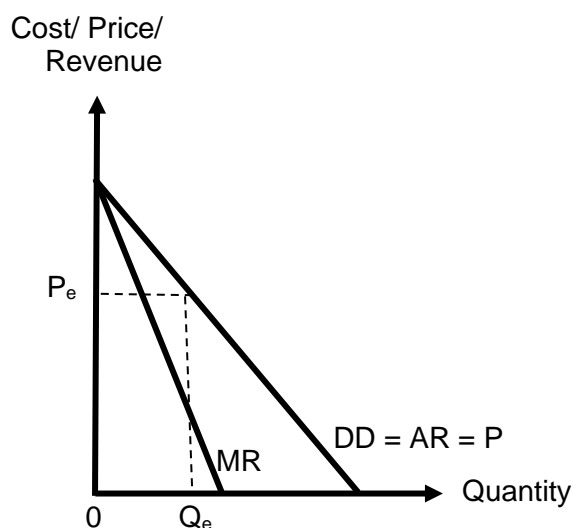
Figure 10: Revenue Curves of a Price-Setting Firm

P($) (price per unit)	Q	TR ($)	AR ($)	MR ($)
10	1	10	10	10
9	2	18	9	8
8	3	24	8	6
7	4	28	7	4
6	5	30	6	2
5	6	30	5	0

Table 1: TR, AR and MR of a Price-Setting Firm

(ii) The demand curve of the firm determines the price it can charge at each output and the average revenue (AR) derived from a particular output

With reference to **Figure 10**, the firm can choose to produce at any output along the horizontal axis.
- If it chooses to produce Qe units, based on the prevailing demand for the firm's product, it would be able to charge Pe, i.e. price per unit at this output.
- If the firm seeks to increase the level of output beyond Qe, the price it would be able to charge will fall below Pe (based on the downward-

---

[4] Based on economic theory, some firms could be price-taking firms that follow the price of the market. However, as most real-world firms are price setters, the focus of the syllabus is on the decisions and strategies of such firms.

> sloping demand curve). You can also see this in Table 1 where the price per unit (P) falls when the firm increases the output (Q).

The firm's price per unit (P) based on the prevailing demand tells us the average revenue (AR) that it could derive. E.g. when the firm produces 2 units, the price per unit (P) is $8, and the AR is also $8 (**Table 1**).

Therefore, when we draw the downward-sloping demand curve of the price-setting firm, DD=P=AR.

(iii) The marginal revenue (MR) of the firm always lies below the AR curve

As shown in **Table 1**, the **MR earned decreases when the firm sells one more extra unit** of its output. This is because the firm has to lower the price it charges on **all** units to sell an additional unit based on the Law of Demand. The implication is that the total revenue increases at a decreasing rate. Hence, **MR curve always lies below the AR curve (Figure 10 & 11).**

If we were to map out the relationship between P and Q, TR and Q, AR and Q and MR and Q on a diagram, we would obtain the following:
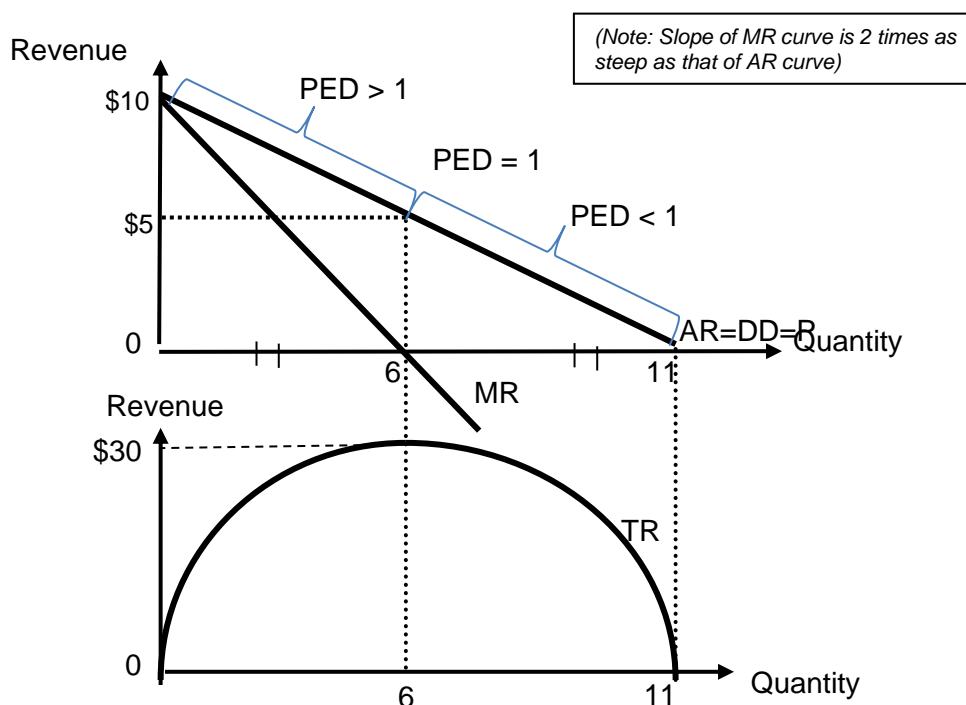
Figure 11: AR, MR and TR Curves for a Price-Setting Firms

(iv) The output where MR=0 is the output where the firm would be making the maximum total revenue (TR) & the slope of the MR curve is 2 times as steep as that of the AR curve

With reference to **Table 1**, at the output where **MR=0** (i.e. where MR cuts the horizontal axis), the firm makes the maximum TR of $30 when it produces 6 units and charges $5 for each unit. You can also see this in **Figure 11** where 6 units correspond with the TR curve's highest point.

> **The revenue maximisation output for a firm is at the output where MR=0.**
>
> **Note: This is not the same as the profit-maximisation output where MC=MR & MC rises (see Section 6.3).**
>
> **Total Revenue (TR) = Price per unit (P) x Output (Q)**
> **Profit = TR – TC (or AR – AC)**

[Optional] This can be explained by the varying price elasticity of demand (PED) along the firm's demand curve (**Figure 11**). *[Note: the reason behind the varying PED along the firm's demand curve is not in the A-Level syllabus. This paragraph is to simply help you understand when the output where MR=0 is the revenue maximisation output and when output 0 to 6 and 6 to 11 should be equidistant]*

The *upper bound* of the firm's demand curve is *price elastic*.	The *lower bound* of the firm's demand curve is *price inelastic*.
Therefore, between output 0 to 6, when the firm reduces the price per unit as it increases output, the Qd rises more than proportionately; hence the TR of the firm increases	Therefore, between output 6 and 11, when the firm continues to reduce the price per unit as it increases output, the Qd rises less than proportionately hence the TR of the firm decreases
(when **PED>1**, recall how a fall in price causes Qd to rise **more** than proportionally).	(when **PED<1**, recall how a fall in price causes Qd to rise **less** than proportionally).
As such, from 0 to 6 units, the TR of the firm increases to the maximum value of $30.	As such, beyond 6 units, the TR of the firm falls.

6.   Objectives of Firms

To understand how a firm makes decisions, we need first to recognise the firm's objectives. Traditional theory dictates that firms aim to maximise profit. We will also learn about alternative objectives that firms may have.

6.1   Profit

In the absence of government intervention, the traditional objective of firms is assumed to be the **maximisation of profit.** Profit is the difference between the total revenue received from selling the good and the total cost of producing the good.

Profit = Total Revenue – Total Cost

The motivating force for an entrepreneur is assumed to be self-interest, and they will actively seek to produce what would give them the most profit. **Profit** is the reward for the risk undertaken by the entrepreneur.

However, the way economists derive profit is different from how accountants derive it. This difference in accounting and economic profit is due to differences in the interpretation of cost.

6.2   Economic Profit vs Accounting Profit

Consider the following example. Mr Salvatore is a pizza shop owner. His costs and revenue are given in the table below.

Rental	$15,000	Sales (pizza)	$80,000
Hired Labour	$12,000		
Utilities	$10,000		
Supplies	$ 8,000		
Maintenance	$ 3,000		
Taxes	$ 2,000		
Total Cost	**$50,000**	**Total Revenue**	**$80,000**
Accounting Profit = $30,000			

An accountant would consider the total cost incurred by Mr Salvatore as $50,000. As such, **Accounting Profit** is calculated as:

   Total Revenue - Total Cost (explicit costs only) = $30,000

On the other hand, an economist would consider the amount of $50,000 as only *a part* of Mr Salvatore's cost, known as *explicit costs*. To calculate total costs, the **economist** would *also* need to consider the *implicit costs*.

- **Explicit costs** refer to actual "out-of-pocket" expenditure incurred by a firm to buy or hire factors of production. They involve money payment or financial outlay made by the firm. E.g. raw material costs and wages.

- **Implicit costs** do not involve any direct payment of money to a third party but involve a sacrifice by the firm. It is incurred on factors of

production owned by the firm. Although the firm does not have to pay to use the factors of production it owns, costs are still incurred as these factors could earn income for the firm from some alternative uses. Economists consider such costs as the *opportunity costs*. Some examples are as follows:

➢ Mr Salvatore could have earned a salary elsewhere instead of operating the pizza shop. If we assume that Mr Salvatore could have worked as an engineer and earned $10,000, it will mean that he had given up that salary of $10,000 to operate the pizza shop. His implicit cost would then be $10,000.

➢ Mr Salvatore could have also invested his own savings into the business. Assuming he had invested $12,000 from his savings in his pizza shop, the opportunity cost would be the interest foregone had he put the amount in a bank. Assuming that the bank pays an interest of 10%, the interest forgone would be $1,200.

➢ Rental could have been earned on Mr Salvatore's pizza shop house. If he rents out the shop, the rental made could be $13,000.

Economists would compute Mr Salvatore's costs and revenue as given in the table below.

Rental	$15,000	Sales (pizza)	$80,000
Hired Labour	$12,000		
Utilities	$10,000		
Supplies	$ 8,000		
Maintenance	$ 3,000		
Taxes	$ 2,000		
Total Explicit Costs	$50,000		
Total Implicit Costs: Salary forgone Interest forgone Rental forgone	 $10,000 $ 1,200 $13,000		
Total Costs (explicit + implicit costs)	$74,200	Total Revenue	$80,000
Economic Profit = $5,800			

An economist would consider the total cost incurred by Mr Salvatore as $74 =,200. As such, **Economic Profit** is calculated as:

Total Revenue - Total Cost (explicit and implicit costs) = $5,800

Summary of Economic Profit vs Accounting Profit

Total Revenue		
Explicit Cost	Implicit Cost	

Accounting Cost   Accounting Profit

Economic Cost   Economic Profit

- Total Profit   =   Total Revenue – Total Cost
- Accounting Profit   =   Total Revenue – Explicit Cost
- Economic Profit   =   Total Revenue – (Explicit + Implicit Costs)
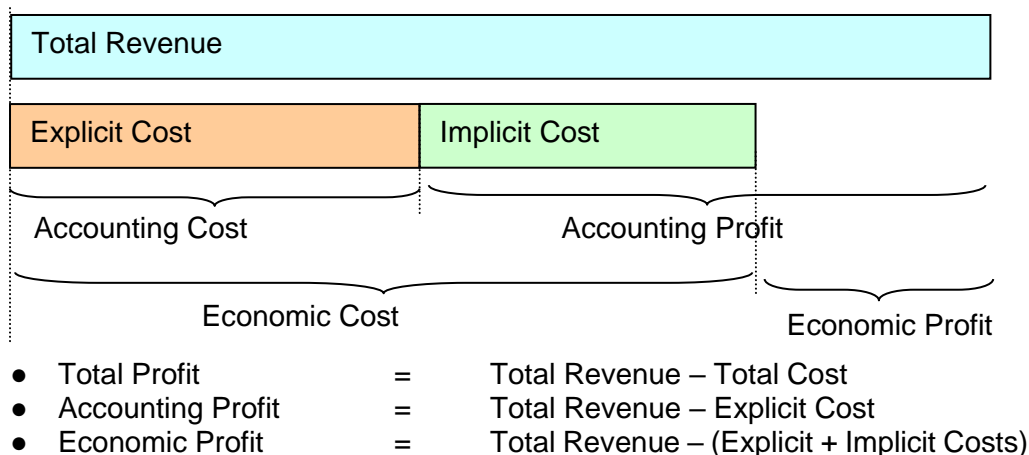
We assume profit to mean economic profit unless otherwise stated. However, in newspaper articles, the profit reported is usually the accountant's profit because it is difficult to estimate implicit costs correctly.

6.3 The Marginalist Principle and Profit Maximisation Objective

Traditional theory assumes that firms make price and output decisions with the objective of profit maximisation. Recall that:
- Marginal Revenue (MR) is the addition to total revenue when one more unit of output is sold; while
- Marginal Cost (MC) is the addition to the total cost when one more unit of output is produced.

[IMPORTANT]
To maximise profits, the firm should produce at the output where MC = MR and MC is rising.
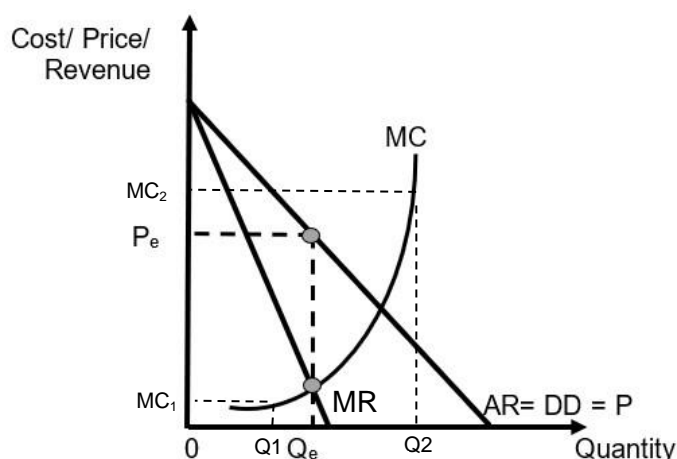

Figure 12: Profit-maximisation output of a price-setting firm

Explanation:

- At Q1, **MR > MC**, it means that when the firm produces one more unit of output, the additional revenue exceeds the additional cost. The firm should then <u>increase</u> its output to increase profit.

- At Q2, **MR < MC**, it means that when the firm produces one more unit of output, the additional cost exceeds the additional revenue. The firm should then <u>decrease</u> its output to increase profit.

> Therefore, based on the Marginalist Principle, the rational firm that aims to **maximise profit** should produce at output Qe where **MC=MR and MC is rising**.
>
> Note: Be careful with the difference between profit-maximisation and revenue maximisation [**see Section 5(iv)**].

- The firm is said to be in **equilibrium** when it is producing at an output level where profits are maximised such that it has no incentive to deviate from this output level unless there is a change in revenue/cost conditions.

6.3.1 Types of Profit

Now that we understand how to illustrate the rational firm operating at equilibrium, i.e. producing at the output where MC=MR and MC is rising, we can now show the different levels of profit the firm may make on a diagram.

The firm may make normal, supernormal or subnormal profits based on the prevailing cost and revenue conditions at the profit-maximisation output.

> **(i) Normal Profit** (zero economic profit)
> - When AR=AC (or TR=TC), normal profit is earned. Note that the firm will earn accounting profit in this case, but he has just covered his explicit and implicit costs only to an economist.
> - ***Normal profit is the minimum amount of profit a firm must earn to stay in the industry in the long run.***
>
> **(ii) Supernormal profit** (positive economic profit/economic profit/profit)
> - When AR – AC (or TR – TC) > 0, supernormal profit is made. It is profit in excess of normal profit.
>
> **(iii) Subnormal profit** (negative economic profit/ loss)
> - When AR – AC (TR – TC) < 0, subnormal profit, or a loss, is made.
> - ***Subnormal profits in the long run would incentivise existing firms to exit the industry in the long run.***
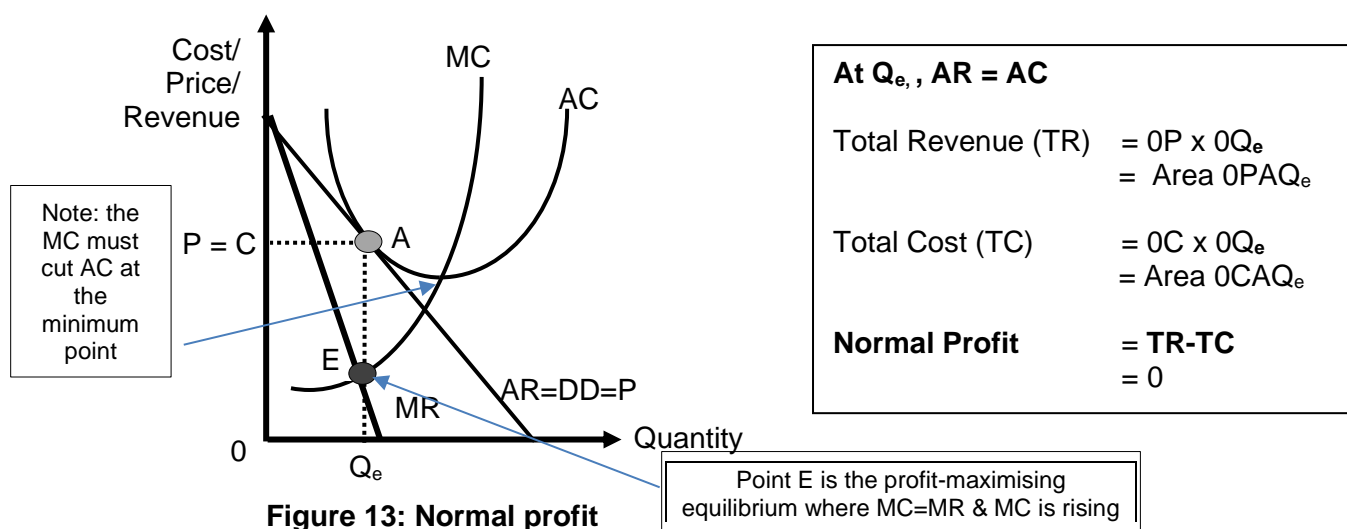
> **Note**:
> Typically, we only include the DD=AR=P, MR and MC curves to show the profit-maximising price and output of the firm (see **Figure 12**).
>
> However, to show the level of profit of the firm on a diagram, we will need to include the ***average cost (AC) curve*** and compare AC with AR to derive the level of profit (see diagrams below).

(i) Normal Profit

As shown in **Figure 13**, the firm maximises its profits by producing at output Q_e, where MC=MR and MC is rising. The corresponding price is given by the demand curve to be P, which is also the AR. The average cost at Q_e is given by the AC curve to be P.

Since AR = AC, **normal profit** is made by the firm at Q_e.

Note: the MC must cut AC at the minimum point

At Q_e, , AR = AC

Total Revenue (TR)	$= 0P \times 0Q_e$
	$=$ Area $0PAQ_e$
Total Cost (TC)	$= 0C \times 0Q_e$
	$=$ Area $0CAQ_e$
Normal Profit	$=$ **TR-TC**
	$= 0$

Point E is the profit-maximising equilibrium where MC=MR & MC is rising

Figure 13: Normal profit

(ii) Supernormal Profit

As shown in **Figure 14**, the firm maximises its profits by producing at output Q_e, where MC=MR and MC is rising. The corresponding price is given by the demand curve to be P, which is also the AR. The average cost at Q_e is given by the AC curve to be C_1.

Since $P > C_1$, there is supernormal profit per unit of $(P – C_1)$, or a total profit of $(P – C_1) \times Q_e$, represented by the shaded area C_1PAB.

At Q_e, AR > AC

Total Revenue (TR)	$= 0P \times 0Q_e$
	$=$ Area $0PAQ_e$
Total Cost (TC)	$= 0C_1 \times 0Q_e$
	$=$ Area $0C_1BQ_e$
Supernormal Profit = TR >TC	
	$=$ Area C_1PAB
	(shaded)

Figure 14: Supernormal Profit

(iii) Subnormal Profit

In some instances, even though a firm produces at the profit-maximising output where MC=MR and MC is rising, it can only make subnormal profit due to the adverse cost and/or revenue conditions.
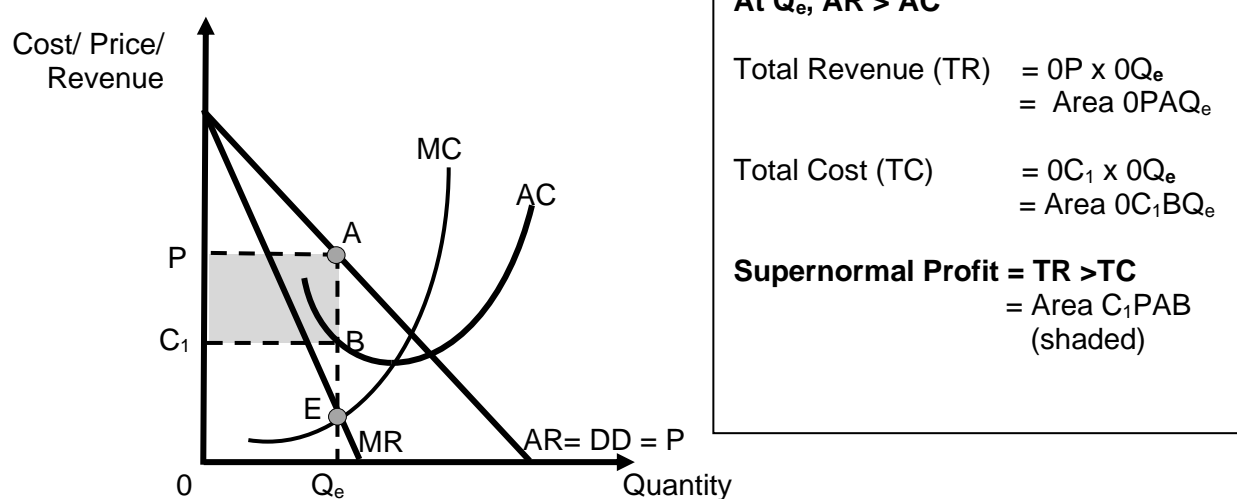
As shown in **Figure 15**, the firm maximises its profits by producing at output Q_e, where MC=MR and MC is rising. The corresponding price is given by the demand curve to be P, which is also the AR. 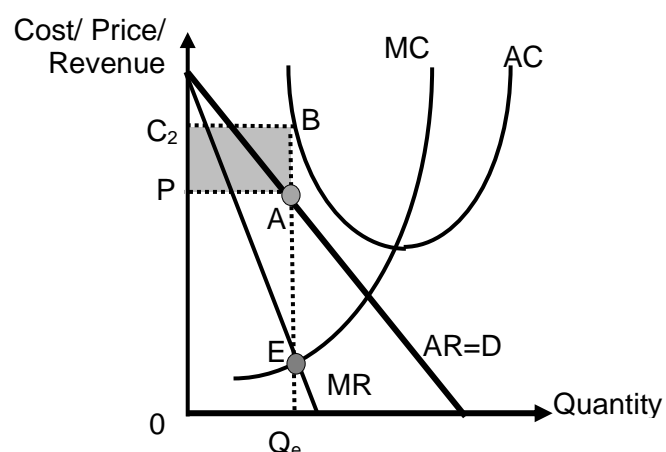The average cost at Q_e is given by the AC curve to be C_2. For every unit that is produced, the monopolist incurs a loss of $(C_2 - P)$ and a total subnormal profit represented by the shaded area C_2BAP.

At Q_e, AR < AC

Total Revenue (TR) = 0P x 0Q_e
                  = Area 0PAQ_e

Total Cost (TC) = 0C_2 x 0Q_e
                  = Area 0C_2BQ_e

Subnormal Profit = TR < TC
                  = Area C_2BAP
                  (shaded)

Figure 15: Subnormal Profit

6.4   Difficulties in Maximising Profit

In practice, profit maximisation may prove difficult due to the following reasons:

a. Lack of Information

The main difficulty in trying to maximise profits is a lack of accurate information about marginal revenue (MR) and marginal cost (MC).
.
- Firms may not have accurate information about opportunity costs and usually only rely on accounting cost rather than economic costs. As such, their estimation of the MC may not be accurate, and they may be maximising accounting profit rather than economic profit.

- Furthermore, it is difficult for firms to compute the MR.
    o It is difficult to anticipate consumers' response and quantity demanded and each price level
    o Firms may not know precisely the demand curves they face and hence their MR.
    o Consequently, pricing decisions are made based on firms' evaluation of the estimated demand for the good or service rather than precise information on the actual demand for the good or service.
        ▪ E.g. a concert organiser has to predict the estimated demand before deciding on the number of concerts to hold and the size of the venue, i.e. deciding the level of output that allows it to

> maximise profit. However, they may under- or over-estimate the demand and therefore the MR. Therefore, they may not be able to maximise profit.

b. Changing environment

Firms operate in a changing environment where market conditions change rapidly and unexpectedly. The demand that a firm faces may change due to changes in its competitors' prices and products, and the firm's output may change due to launching a new product through advertising. This would thereby affect MR and profit-maximising output.

However, firms may not want to frequently change price or output as market condition changes to maximise profit, which could confuse consumers or incur even more costs.

c. Government Regulation

Government policies could restrict firms' pricing or output decisions. For example, providers of essential goods and services, such as public transport operators, are heavily regulated or publicly owned. Such firms may be required by policy to produce at output levels determined by the government, for example, where P=MC or P=AC ensures affordability and adequate provision of these essential goods to ensure equity. These firms are thus not able to pursue profit maximisation (see **Section 10**).

Examples include SMRT and SBS Transit which must seek approval from the Public Transport Council before adjusting transport fares.

> **Note:**
> Due to the difficulties above (lack of information), even though economic theory states that firms maximise profits by equating MR with MC, firms try to maximise profits by simply trying to reduce the AC and/or increase the AR for a given level of output.
>
> Alternatively, firms may resort to simpler pricing models, such as cost-plus pricing, where firms put a mark-up on top of the average cost of their goods and adjust the mark-up based on how well the goods are selling to increase profits (even though they may not be making the maximum level of profits).

6.5 Alternative Objectives

The traditional theory of the firm assumes that firms aim to maximise profit. However, profit maximisation may not be realistic for two reasons. Firstly, firms may seek to profit-maximise but are unable to do so as discussed above in **Section 6.4**.

Secondly, firms may choose to achieve **alternative objectives** instead of profit maximisation, which we will discuss.

(a) Revenue maximisation

In many instances, firms' operations are not run by the owners who seek to maximise profit. The owners of the firm may have employed sales managers

and commission-based employees who may seek to maximise total revenue because their salaries and perks may be tied to total revenue rather than the level of profits.

Firms attempting to maximise total revenue would seek to produce where **marginal revenue equals zero (i.e. where MR= 0),** as shown in **Figure 16**.

See detailed explanation in **Section 5(iii) – Figure 11**.
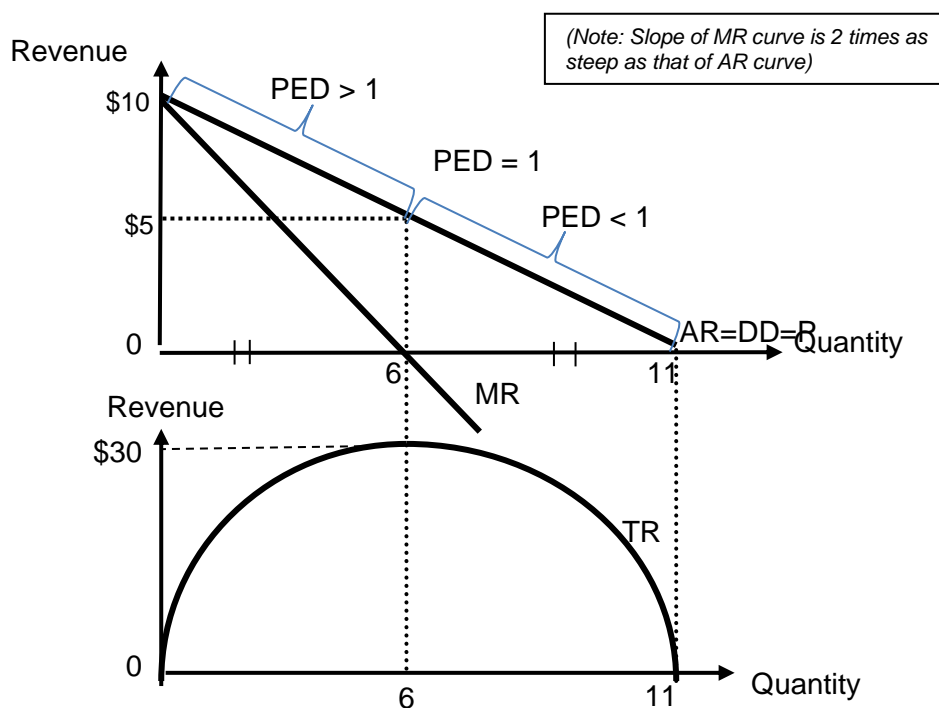
Figure 16: Revenue maximisation

(b) Profit Satisficing

Firms may be content with a profit satisficing output level instead of profit maximisation.

The cost of obtaining sufficient information to make profit maximising decisions could be significantly high, especially where firms have several production locations globally. Firms may also aim for profit satisficing level of output to avoid stress or perceived challenges from profit maximisation.

More importantly, there may be a separation between ownership and control. For example, shareholders may own the firm, but the firm employs managers (who are usually paid a fixed salary) to run it.

Although the owners may want to maximise profits, they may not know the maximum level of profits. The managers have much less incentive to maximise profits because they do not get to share in the profits. Therefore, managers may create a minimum profit level to keep shareholders happy even though it falls below the profit maximising level.

(c) Market Share Dominance

Some firms may wish to increase their share of a market. This motive is significant for firms operating in markets with a few large competitors. Hence, these existing firms would make decisions to drive rival firms out of the market.

For example, the firm could engage in **predatory pricing**, especially when the firm has past profits to cope with the losses incurred. Over time, rival firms might not be able to cope with the losses incurred due to having to match the low prices set by this firm and hence choose to exit the market. This allows the remaining firms to increase their market share and market power.

> **Definition**:
> ***Predatory pricing***: Where a firm sets its prices below average cost to drive competitors out of business (based on the objective of 'market share dominance')

Many start-ups focus on growth and securing a significant market share even though they may not be making a profit. This may involve considerable price-cutting and spending on advertising and R&D. As of 2019, the following firms were still unprofitable: Grab, Carousell, Uber, Shopee and Spotify.

Many investors continue to invest in these firms based on the belief in the growth potential for these firms. When they eventually dominate the market, their ***demand would be more price inelastic*** due to the lack of rival firms. In this case, they could set higher prices in the future and ***increase their total revenue*** since the ***quantity demanded for their products would fall less than proportionately as PED<1***. Such firms would then be able to increase profits, ceteris paribus.

(d) Environmental Concerns

Firms may consider the impact of their goods and production processes on society and the environment and hence use less harmful inputs or production methods, even though this would cause it to ***incur a higher MC than that which would allow it to maximise profits***.

For example, food manufacturers may use healthier ingredients like unsaturated oils to cook their products or bio-degradable packaging like paper rather than non-biodegradable ones made from plastics to pack and store their products. However, using such premium "healthier/organic" ingredients and more biodegradable packaging will incur higher costs, which could mean lesser profits.

While critics may consider such actions to be merely responses that cater to the demand of increased health and environmentally conscious consumers, the managers or owners of some of these firms could be undertaking such decisions at the expense of profits as they have altruistic intentions.

7. Market Structures

7.1 Characteristics to Categorise Market Structures

Economists generally classify the four market structures (perfect competition, monopolistic competition, oligopoly, monopoly) based on characteristics such as:
- 7.1.1 Barriers to entry
- 7.1.2 Number and size of firms; and
- 7.1.3 Nature of product.

When firms consider the strategies to use to increase profits, they will consider the market structure in which they operate to understand the possible level of competition and the likely impact of their strategies.

7.1.1 Barriers to entry

> **Definition:**
> ***Barriers to entry*** are conditions that impede the entry of new firms into an industry.

These barriers can limit the level of competition faced by existing firms in the industry. The barriers to entry that characterise a given market can be high or low, depending on the ease of overcoming the barriers.

High barriers lead to low levels of competition and vice versa.

The barriers to entry can also affect the **contestability** of markets and hence affect the level of profits firms can make in the long run.

> **Definition:**
> ***Contestability*** refers to the ability of new rival firms to enter an industry to compete with existing firms.

Barriers to entry → affects contestability of markets → affects long-run profits of firms in the industry → affects the ability of firms to engage in strategies to maximise profits, e.g. Innovation, Diversification & Marketing.

Larger firms in more concentrated / less competitive industries (e.g. Oligopoly)	Smaller firms in less concentrated / more competitive industries (e.g. Monopolistic Competition)
- An industry is less contestable if new rivals find it difficult to enter the industry to compete with existing firms due to ***high barriers to entry.*** - Existing firms are better able to protect their long-run supernormal profits	- An industry is said to be ***contestable*** if new rivals can easily enter the industry to compete with existing firms due to ***low barriers to entry***. - New firms can easily enter such an industry when there is potential to earn supernormal profit. - New entrants can reduce the market power of existing firms and push down prices. - In the long run, firms in such an industry will only be able to earn **normal profit** as new entrants will continue to enter the market and push down prices if there are opportunities to make supernormal profit.

Types of Barriers to Entry:
1. Cost barriers
2. Access to key resources/ factor inputs
3. Financial barriers
4. Legal barriers
5. Anti-competitive strategies of incumbent firms
6. Information barriers
7. Product differentiation & brand loyalty

7.1.1.1 Cost barriers (including Economies of scale) [Natural Monopolies]

Some industries are characterised by very high fixed costs, e.g. market for electricity and water distribution or mass rapid transit systems. When a firm enters such industries ahead of others, it can expand and reap immense internal economies of scale to produce at a lower average cost. Hence, it would be able to charge a lower price than other potential entrants.

Rival firms trying to enter the market later will find it hard to expand in the face of the established firm and are likely to operate on a smaller scale. This implies higher average cost due to the lack of economies of scale, and therefore, uncompetitive, higher prices. Therefore, high fixed costs serve as a natural barrier discouraging the entry of new firms. As a result, the monopolist (a single firm in the industry) remains the only seller in the industry.

In some cases, the fixed costs can be so high that a firm may face **falling average cost** over the **full range of market demand**, resulting in **natural monopolies** (**see Section 8.2**). The implication is that it is more cost-effective for a single firm to serve the entire market than if total market output were shared between two or more competitors, which would result in a higher average cost for each firm.

7.1.1.2 Access to key resources/ factor inputs

When an existing firm has exclusive ownership or control over inputs necessary to the production process, potential new firms may face a very high barrier to entry. Similarly, a firm can prevent potential rivals from gaining access to consumers if it controls the wholesale or retail outlets through which the product must be sold.

- *Example 1*: In 2012 Amazon purchased Kiva Systems. This company was the leading supplier of robotics for several warehouse operators and retailers. After the takeover, Kiva only supplied Amazon and was renamed Amazon Robotics in 2015. As a result, other merchants found it hard to enter the market to compete with Amazon due to the lack of access to such robotics.

- *Example 2*: De Beers used to be a monopoly in the diamond market as it signed exclusive agreements with diamond suppliers, which gave it unrivalled control over supplies of diamonds. (*Note*: De Beers is no longer a monopoly. Its market share fell from 90% in 1980 to only 33% in 2013 due to international competition.)

7.1.1.3 Financial barriers

Firms may incur high start-up costs to operate in some industries, which could deter initial market entry due to the inability to obtain loans to finance the initial costs. These are usually fixed costs which cannot be recovered when the firm leaves the industry, known as **sunk costs**. These may include expensive machines for a specialised production process or high advertising costs to raise brand awareness, etc. In other cases, incumbent firms may have spent large sums of money on Research & Development, which means that new entrants will have to match or exceed this level of expenditure to compete. However, *firms may not be able to obtain loans from financial institutions, e.g. banks, to finance these sunk costs and hence find it difficult to enter such industries.*

> **Note**: The financial barriers to entry lie in the difficulty of obtaining the means to finance these expenses. The subtle difference between financial and cost barriers is that firms that can obtain financing means, such as loans or start-up capital from investors, will still face a cost barrier to entry but not a financial barrier.

7.1.1.4 Legal barriers

To encourage innovation, the government may grant **patents** to the inventor of an innovative product for some time. A patent gives an inventor the exclusive right to sell for some time, currently 20 years under international rule. As long as the patent is in effect, other firms cannot produce the same good. The firm is effectively a monopoly during the period of patent.

Example: Pharmaceutical firms typically apply for patents for the drugs they have developed. E.g. Moderna's Covid-19 vaccine cannot be replicated by other firms to help drive global vaccination rates due to its patent, and it has resisted calls to waive its patent rights.

Copyright has effects similar to patents. It refers to the legal right to control all possible ways of producing a copy of an original piece of work, such as a book, film or piece of music.

Monopolies of various kinds are sometimes established because government grants monopoly power by issuing **licenses or exclusive franchises**. For example, before 1997, Singtel had the exclusive rights to operate the network and sell equipment in mobile telecommunication in Singapore, making it a monopoly. There are three other telecommunication service providers- M1, Starhub and TPG Telecom. In addition, there are few other Mobile Virtual Network Operators such as MyRepublic. This was because the government introduced greater competition in the industry in 2000 by removing the limits on the number it issues to telcos.

7.1.1.5 Anti-competitive strategies of incumbent firms

Firms could use price and non-price strategies to deter new firms from entering the market.

(i) Anti-competitive **Price** Strategies

1. **Limit pricing** is designed to **deter the entry of new firms** to protect an incumbent firm's monopoly power and supernormal profits. The limit price is set below the profit-maximising price.
    - o Also, the price is lower than the **estimated AC of a potential entrant**. As a result, the potential entrant may decide that the risks of entering the industry are too high as its average cost is relatively higher due to its smaller scale.
    - o Limit pricing is more effective if there are substantial internal economies of scale enjoyed by established because the average cost is significantly lower than the new entrant.

2. Alternatively, incumbent firms may adopt **predatory pricing to drive out existing firms**.
    - o This occurs when an incumbent firm responds to a new firm entering the market by setting its **price below its average cost** to drive competing firms out of business.
    - o Predatory pricing is illegal in many countries that practise competition laws. However, it may be difficult to prove.

Example: Amazon is known to sell its e-book reader and tablet, the Kindle and Fire, at below cost to dominate the market and prevent rival firms who cannot match its low price from competing with it. In addition, for years after introducing the Kindle, Amazon paid publishers $12 to $14 for many e-books though it sold them to Kindle consumers at $9.99. As a result, Amazon could incur losses on the Kindle and Fire as it could reap immense economies of scale that drove its average costs lower than smaller rival firms. This strategy was very successful for Amazon. It sold millions of Kindle and added many readers to its Amazon Prime programme – many of whom would not switch to rival firms.

Note: Differences between limit pricing and predatory pricing

	Limit Pricing	**Predatory Pricing**
Objective	Acts more as a deterrence *before* entry of a new firm (competitor) takes place.	Drive competitors *out* of the market
Pricing	- Price is set below the normal profit-maximising price - Price is lower than the estimated AC of potential entrants (since its own AC is much lower due to iEOS hence may not be earning subnormal profits)	Price is set below AC – incurs losses i.e. subnormal profits

(ii) Anti-competitive <u>Non-Price</u> Strategies

Firms may mount massive advertising campaigns or introduce attractive after-sales services, until the loyalty to the brand is so strong that the brand becomes synonymous with the product.

- *Example 1*: Grab introduced loyalty programmes to lock in consumers and prevent them from switching to Go-Jek.
- *Example 2*: Alibaba was found to have prevented its merchants selling on its website from selling their goods on other shopping platforms. This prevented other e-commerce platforms from competing due to the lack of a variety of products.

7.1.1.6 Information Barriers

How easy is it for consumers to find and compare the price and quality of goods/services offered by alternative firms? The more time and effort it takes, the greater the switching costs. To prevent consumers from switching to their competitors, firms may choose to withhold information or implement information barriers. Information barriers are policies that a firm can configure to prevent individuals or groups from communicating with each other. They are also useful when a group needs to be isolated or prevented from communicating with anyone outside of that group.

Examples:
- **Education**: Students in one school cannot look up contact details for students of other schools.
- **Legal**: Maintaining the confidentiality of data that is obtained by the lawyer of one client and preventing it from being accessed by a lawyer for the same firm that represents a different client.
- **Government**: Information access and control are limited across departments and groups.
- **Professional services**: A group of people in a company can only chat with a client or a specific customer via guest access during a customer engagement.

7.1.1.7 Product Differentiation & Brand Loyalty

Suppose a firm produces a clearly differentiated product, where the consumer associates the product with the brand. In that case, it will be very difficult for a new firm to break into that market. For example, when looking for some information by using an Internet search engine, people often say 'they googled it'. Other examples of a strong brand image include Kellogg's® Cornflakes, Coca-Cola®, Nescafé® and Kleenex®.

In other instances, firms may create customer loyalty programmes, e.g. loyalty cards, reward points and frequent flyer programmes, to reinforce brand loyalty that prevents customers from switching to new brands. Alternatively, firms may require customers to sign contracts that involve penalties for early cancellation that prevent customers from switching to competitors.

7.1.2 Number of firms relative to market size

The number of firms relative to the market size serves as a guide to the level of competition within the industry and hence, the type of market structure. The proportion of the total market output produced by each firm determines its *market share*. Firms with a sizable market share would be better able to control prices and possess a high degree of market power. Furthermore, high barriers to entry can determine the number of firms in the market because high barriers to entry limit the number of firms operating in the industry. In turn, higher barriers to entry allow these firms to dominate the market and enjoy significant market share and market power.

> **Definition: Market power** is the extent to which a firm(s) can influence a product's market price.

Industries with a higher number of firms tend to have a higher level of competition. Assuming that each firm has an equal market share, the larger the number of firms, the smaller the market share owned by each firm and hence a higher level of competition (i.e. low degree of market power).

> **Note:**
> When questions refer to the 'level of competition in the market' or 'market competitiveness', students should link 'number of firms in the market'. In general, markets become more competitive when a new firm enters. On the contrary, markets become less competitive when mergers and acquisitions take place such that the number of firms decreases.

7.1.3 Nature of Product

The nature of products sold within an industry is indicative of the market structure it belongs to. Firms may produce products that are:
- *Homogeneous*, i.e. the product sold by one firm is indistinguishable from that by another firm;
- *Unique*, i.e. the product has no substitutes; or
- *Differentiated*, i.e. products have are different in some ways from others but also have many close substitutes, e.g. different brands of bubble tea.

Products may have *real* or *perceived* differences. *Real* differences can be created in terms of product specifications, while *perceived* differences can be created through product branding.

7.2 Types of Market Structures

Based on the above characteristics, markets can be broadly classified into perfectly and imperfectly competitive markets:
- **Perfectly competitive markets** refer to markets where free competition exists (Perfect Competition).
- **Imperfectly competitive markets** refer to markets with restrictions to free competition (Monopolistic Competition, Oligopoly & Monopoly).

The following table shows four market structures. Since they have different characteristics, their degree of competition and the market power of firms within the market dramatically differs.

Table 2: Features of Different Market Structures

Characteristics	Perfect Competition (Absence of market power)	Imperfect Competition (Presence of Market Power)		
		Monopolistic Competition	Oligopoly	Monopoly
Barriers to Entry	<u>No</u> barriers to entry	Low barriers to entry	High barriers to entry	Very high barriers to entry
No. of Firms (relative to Market Size)	Very large number of small firms	Large number of small firms	A few large firms dominate the market	One dominant firm
Nature of Product	Homogeneous	Differentiated	Homogeneous or Differentiated	Unique

7.2.1 Perfect Competition

> **Definition:**
> ***Perfect competition*** refers to a market structure where there are many firms, none of which is large; where there is freedom of entry into the industry; where all firms produce an identical product; and where all firms are price takers.

(i) No Barriers to Entry – Freedom of Entry

There are no barriers to entry for new firms in the perfectly competitive market, i.e. firms can easily enter and leave the market. Since profits drive firms, potential entrants will be enticed to enter the industry if existing firms are making supernormal profits. As new firms enter the market, profits earned by each firm will drop until they are making normal profit. The ease of entry ensures many firms operate in the industry at any point and that perfectly competitive firms can make only normal profits in the long run.

(ii) Large Number of Small Firms

Due to the absence of entry barriers, many **small firms** or sellers exist in the industry, and each firm produces an insignificant share of the total output in the market. Therefore, no single firm has the market power to influence the market price.

As a result, each firm has to accept the prevailing price in the market as determined by the interaction of the market demand and supply. Hence, such firms are said to be **price takers.**

Perfectly competitive firms have **no market power**. Thus, they can't influence the market price by changing its supply because its individual supply is insignificant to the market supply.

(iii) Homogeneous Product

All perfectly competitive firms produce **homogeneous products,** i.e. the product sold by one firm is **identical** to that by another firm. Thus, their products are **perfect substitutes**. As a result, demand for their goods is also **perfectly price elastic.**

> **Explaining why Perfectly Competitive firms are price takers**
>
> Perfectly competitive firms are **price-takers** with no market power because:
> - There are **no barriers to entry** and hence there are a large number of small firms with insignificant market share; and
> - They sell **homogenous products** that are perfect substitutes.

> **Note:** Perfect competition (where firms are price takers) is merely a ***theoretical model*** to benchmark other less competitive real-world markets. While **such a market in its purest form does not exist in reality**, there are real-world markets (e.g., commodities and agricultural goods) that are pretty close to being perfectly competitive. Nevertheless, as most real-world firms are price setters, the focus of the syllabus is on the decisions and strategies of such firms.

7.2.2 Monopoly

Monopoly lies at the opposite end of the market structure spectrum to perfect competition.

> **Definition**:
> ***Monopoly*** refers to a market structure where there is only one firm in the industry.
>
> There is no competition since there is only **one seller** of a unique good with no close substitutes, and there are very high barriers to entry.

As the only firm in the market, the monopolist enjoys extensive market power.

Like perfect competition, it is considerably difficult to find examples of a pure monopoly in which there is only one firm in the market because of:
- Improving technology and globalisation reduce the barriers to entering an industry, leading to greater competition domestically and internationally (e.g. e-commerce markets); and
- Government regulations encourage competition in various industries because monopolies harm consumers' interests and social welfare.

Characteristics of Monopoly

(i) Very high barriers to entry

There are **formidable barriers to entry** which prevent other firms from entering the industry to produce the same product. These barriers keep potential competitors out of the industry and allow the monopoly firm to retain its position as the sole seller in the market. There are various types of barriers to entry, as discussed in Section 7.1.1 below.

Assuming no change in demand and cost conditions over time, the existence of such high barriers would mean that the monopolist making supernormal profits in the short run may **continue to make supernormal profits in the long run.**

(ii) One producer

There is **only one producer** in the market. The sole producer is known as the monopolist. The monopolist has **complete dominance** of the market, and it is not subjected to competition from rival firms.

Due to the very high barriers to entry and selling of a unique product, the monopolist is the only producer and exercises **extensive market power.** It can therefore **influence the price** at which it sells its goods. It can raise the price by restricting output or reduce the price by increasing its output.

Hence, as a price-setting firm, the monopolist faces a **downward-sloping demand curve (Fig. 17)**. According to the Law of Demand, quantity demanded and price are inversely related. Hence, the monopolist faces a trade-off between price and quantity – it has to reduce the price if it wants to sell more or accept lower output if it wants to raise the price. A monopolist **cannot control both price and quantity, but either price OR quantity.** [This concept of price-taking firms and the reasons for the shape of the cost and revenue curves were

explained in **Section 5(i)**].
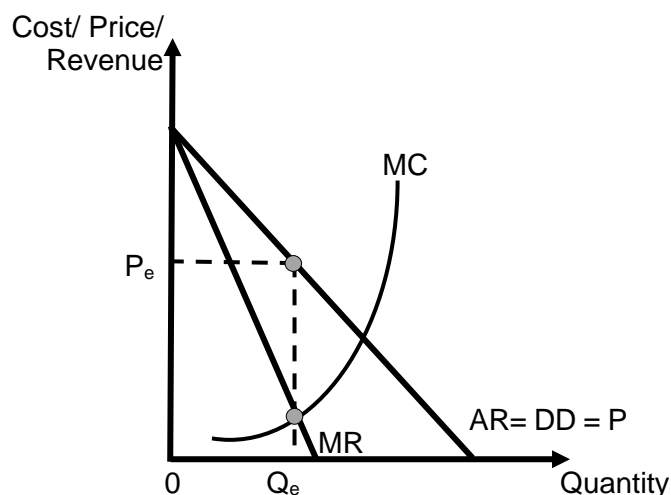
Figure 17: A monopoly producing at profit-maximising output where MC=MR

(iii) Unique product

The product sold by a monopolist is **unique,** with **no substitutes** for the product. This implies that consumers can only purchase the product from the monopolist and have no alternatives to switch to. As a result, in markets with monopolies, the **demand is relatively price inelastic**.

Examples of Monopoly

It is rare to find pure monopolies privately owned in the real world, as governments would typically have regulations in place to prevent such market dominance. The impact of such monopolies and regulations to address market dominance as a source of market failure will be covered in **Section 11**.

However, the following firms are *arguably* monopolies given the almost total market share that they hold:

- Google accounts for nearly 90% of internet search queries

- Luxottica controls most major brands in the eyeglass industry and produces more than 80% of eyewear worldwide, e.g. Ray-Ban, Chanel etc.

Other than that, most monopolies that continue to exist today tend to be owned by the government and many of these are *natural monopolies*.

Example: Natural Monopoly

> **Definition:**
> A *natural monopoly* is defined as an industry where long run average costs fall throughout the range of market demand.

[The following explanation was introduced in **Section 7.1 Barriers to Entry**]

Some industries are characterised by **very high fixed costs**, e.g. market for electricity and water distribution or mass rapid transit systems. When a firm enters such industries ahead of others, it can expand and reap immense economies of scale to produce at a lower average cost. Hence, it would be able to charge a lower price than other potential entrants.

Rival firms trying to enter the market later will find it hard to expand in the same market as the established firm and will likely operate on a smaller scale. This implies higher average cost due to the lack of economies of scale and uncompetitive and higher prices. Therefore, high fixed costs serve as a natural barrier discouraging the entry of new firms. As a result, the monopolist remains the only seller in the industry.

In some cases, the fixed costs can be so high that a firm may face **falling average costs** over the **full range of market demand**, resulting in **natural monopolies**. The implication is that it is more cost-effective for one firm to serve the entire market than if total market output were shared between two or more competitors, resulting in higher average costs for each firm. The figure below illustrates why this is so.

The minimum efficient scale (MES) of operation of such industries is large relative to market demand. The diagram illustrating a natural monopoly, where the *economies of scale are so large* that the LRAC and MC curves are falling throughout the entire output range, is shown in Figure 18.
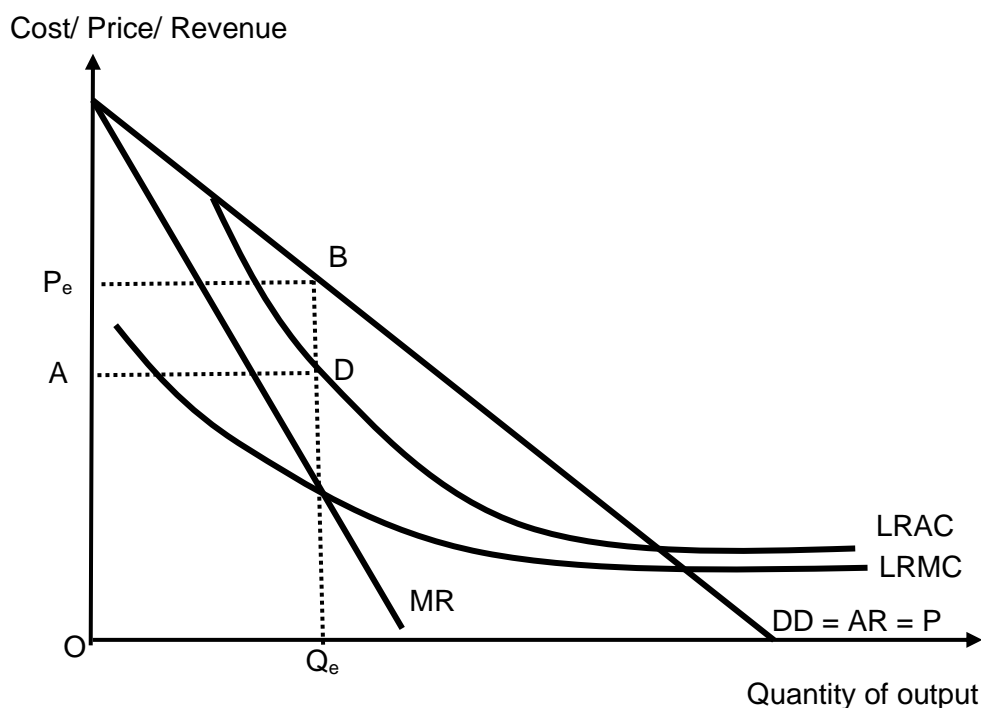

Figure 18: Natural Monopoly

Firms and Decisions (H2 Economics/ 9570)

The natural monopoly equilibrium output is at Q_e where the monopolist's profit is maximised (i.e. the output where MC=MR). Correspondingly, the price to be charged at Q_e, as given by the demand curve is Pe. A supernormal profit of area P_eBDA is made.

Natural monopolies usually occur in public utility industries, such as water and electricity distribution, where fixed costs are extremely high due to the building of extensive distribution networks. Resources could be wasted on competition since it requires duplication of networks.

In Singapore, the Public Utilities Board (PUB) is the sole supplier of water services. Since 2001, PUB was reconstituted as Singapore's national water authority to oversee the entire water loop.

Note: Electricity Markets in Singapore

Electricity reaches consumers through three stages, and only the second market below is a natural monopoly:
1. Power generation (the production of electricity in power plants);
2. Power transmission (the flow of electricity through cables); and
3. Power distribution (the link to households and businesses).

There are multiple power generation companies in Singapore, e.g. SembCorp Cogen, Tuas Power Generation etc. Numerous firms in the power distribution market retail electricity to households, e.g. Keppel Electric and Sunseap.

However, given that **there is only one power grid in Singapore, the transmission of electricity by Singapore Power remains a natural monopoly**. This is because the network of electrical cables entails substantial technical economies of scale. As a result, it is economically not viable to have more than one grid to compete.

Note: Railway Market in Singapore

The railway market in Singapore is <u>not</u> a natural monopoly as there are two major firms, i.e. SMRT and SBS Transit.

However, the urban railway markets in Hong Kong (MTR Corporation), Taiwan (Taiwan Railways Administration and London (London Underground Limited) are sole operators in their local markets and they are examples of natural monopolies.

7.2.3   Oligopoly

Definition:
An *oligopoly* refers to a market **dominated by a few large firms** with **high barriers to entry**. Products may be differentiated or homogenous.

As the few large firms that dominate the industry possess significant market share and market power, oligopolistic firms have high rival consciousness and be mutually interdependent.

Note: There can be many firms in the oligopolistic market, but a few large firms dominate the market.

A <u>duopoly</u> is a particular case of an oligopoly where there are only 2 firms in the market. For example, there are currently only two rail operators in Singapore: SMRT and SBS Transit.

High barriers to entry

Similar to monopolies, Oligopolistic markets have high barriers to entry (see **Section 7.1.1**).

The type of the different barriers differs from industry to industry. For example:
- High start-up costs, e.g. airlines;
- Legal barriers, e.g. pharmaceutical firms with patents; and
- Strong brand loyalty, e.g. Nike and Adidas in the market for sports apparel.

It is also not uncommon for firms to engage in aggressive advertising campaigns and predatory pricing, which deter the entry of new firms.

A few large firms dominate the industry

A few large firms dominate an oligopoly market. Terms like "Big 4", "Big 6", "Big 8" etc., are used in the context of an oligopoly market. For example, the global smartphone market is dominated by the following six firms (organised by market share):

Firms and Decisions (H2 Economics/ 9570)
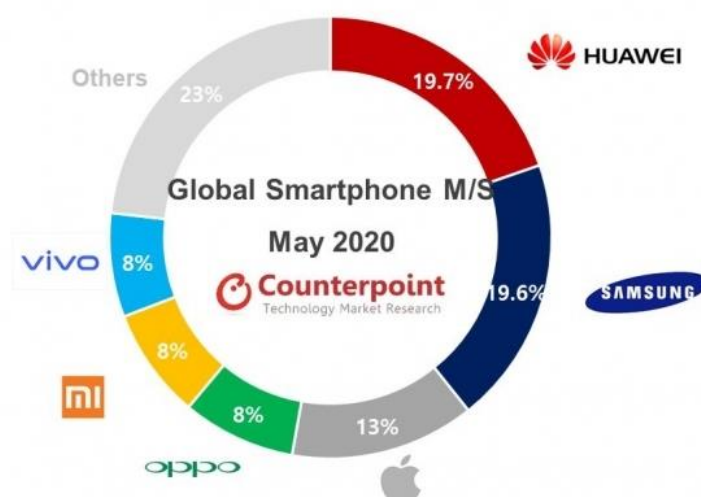
An oligopoly may have as few as three or four firms or as many as a dozen firms **dominating or leading the industry.** What is more important is the *market concentration ratio,* which indicates the top largest firms' combined market share in the industry.

> **Definition:**
> The *market concentration ratio* measures the combined market share of the top '*n*' firms in the industry.

$$\text{n-firm concentration ratio} = \frac{\text{Output of } n \text{ largest firms}}{\text{Total industry output}} \times 100\%$$

If the top four firms have a combined output of 60%, then the 4-firm concentration ratio is 60%.

In general, the higher the market concentration ratio, the greater the degree of rivalry that is likely to exist between these firms. Rivalry means that firms will take the reactions of other firms into their decision-making process. So, a market where the top four firms supply 80% of the market is likely to exhibit more rivalry than a market where the top four firms supply only 60%

An oligopoly has a **high market concentration ratio**. A common rule of thumb is that an oligopoly exists when the top five firms in the market account for more than 60% of total market sales or production.

Example of oligopolistic markets:
Global Logistics Services – FedEx, DHL, UPS have a market concentration ratio of 84%
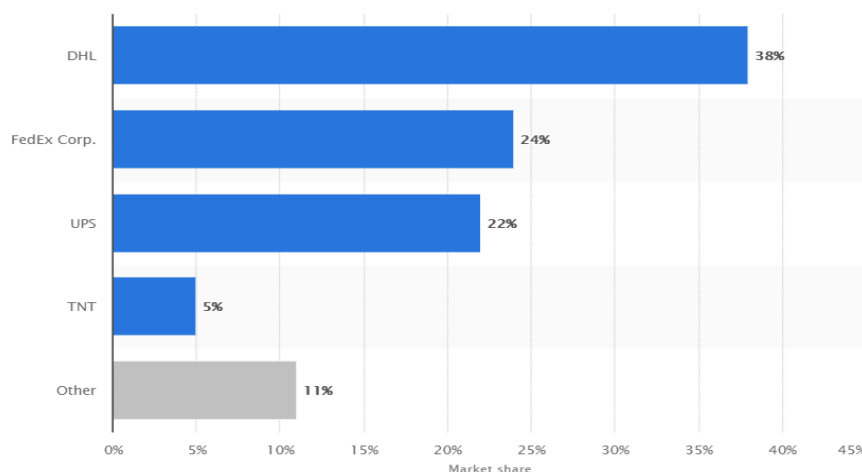
Commercial aircraft manufacturers – Boeing and Airbus- have a market concentration ratio of 66%.
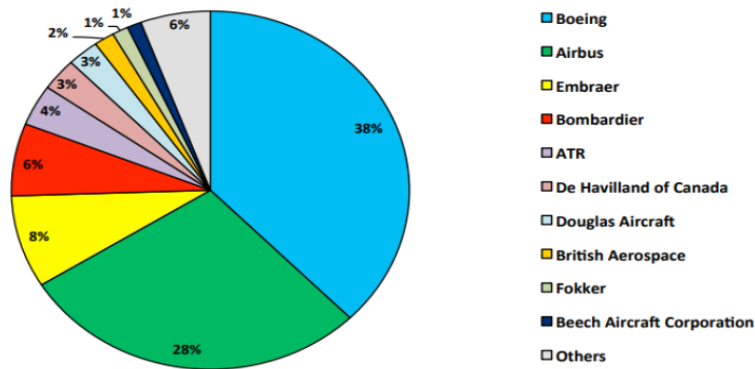
Note that there is no fixed way to calculate concentration ratios. It is possible to calculate the concentration ratio of the top 4 firms or top 8 firms.

Differentiated or homogeneous product

The products could be homogeneous or differentiated, depending on the markets:
-   For example, while the oil market is dominated by a few major oil-producing countries such as Saudi Arabia, Russia, Iran, and Iraq, crude oil is mainly *homogeneous.*
-   On the other hand, car markets are dominated by a few major car-makers, such as General Motors, Toyota, Hyundai & Volkswagen, and their cars are highly *differentiated.*

Even though oligopolistic firms may sell homogenous products, they are still **price-setting firms**. This is because there are high barriers to entry in the market that allow existing firms to secure high market share. Hence, an oligopolistic firm faces a **downward-sloping demand curve**. With few substitutes available in the market, the demand faced by each oligopolistic firm is **relatively price inelastic**. This enhances the "market power" of each oligopolistic firm to set relatively high prices in the market without losing all its customers to its competitors.

> **Self-Assessment 6**
> What are the characteristics of an oligopoly that is different from that of monopoly?

Mutual Interdependence of Firms

Because of the high BTE and the oligopolistic market being dominated by a few large firms, the actions of one or more of these firms tend to impact the competitors significantly. Therefore, when making business decisions, an oligopolist has to consider the possible reactions of its rivals. For example, suppose a firm changes the price or specification of its product or the amount

of its advertising. In that case, the sales of its rivals' will be affected, which prompts rivals to take mitigating actions. The rivals may then respond by changing their price, specification or advertising.

Such behaviour is known as **mutual interdependence** or exhibiting **high rival-consciousness.**

> **Note:**
> The characteristics of '*mutual interdependence*' and '*high rival consciousness*' are unique features of oligopolistic firms and must be highlighted when analysing firms in such markets.

Implications of mutual interdependence

Due to the mutual interdependence and high rival consciousness, oligopolistic firms have to decide whether to collude with other firms. Collusion as a strategy of the firm will be explained in greater detail in **Section 8.6**. We will also learn how oligopolistic firms may refrain from price competition even if they choose not to collude with other firms and prefer non-price strategies in **Section 8**.

Oligopolistic firms refrain from price competition based on the 'kinked demand curve' model

The name follows from the feature of demand curve of firms in a competitive oligopoly model. It assumes that each firm in an oligopolistic market believes that rivals will match its price reduction but will not follow suit with its price increase.

To illustrate, let us take the telecommunication industry in Singapore as an example. The industry is dominated by a few large firms, including Singtel, Starhub and M1.

Assume the price of mobile plans in the market is P_0. How would competitors react if Singtel raises its price? What happens if Singtel reduces its price?

The flowchart below shows the possible reaction of Singtel's competitors to its action of raising price above P_0 and reducing price below P_0.

If Singtel <u>raises</u> its price above P_0	If SIngtel <u>lowers</u> its price below P_0
Competitors do not follow so as to gain market share Customers switch to competitors' products Demand is **more** price elastic at prices above P_0 (represented by AE portion of demand curve)	Competitors follow and lower prices to avoid loss of market share Firm's market share mostly unchanged Demand is **less** price elastic at prices below P_0 (represented by EF portion of demand curve)
An increase in price by Singtel will hence lead to a <u>more than proportionate</u> fall in quantity demanded Revenue and profit decline	A fall in price by Singtel will hence lead to a <u>less than proportionate</u> rise in quantity demanded Revenue and profit decline

This mixed response of competitors will result in a demand curve for the firm that is 'kinked' at price = P_0 as shown in Figure 17.
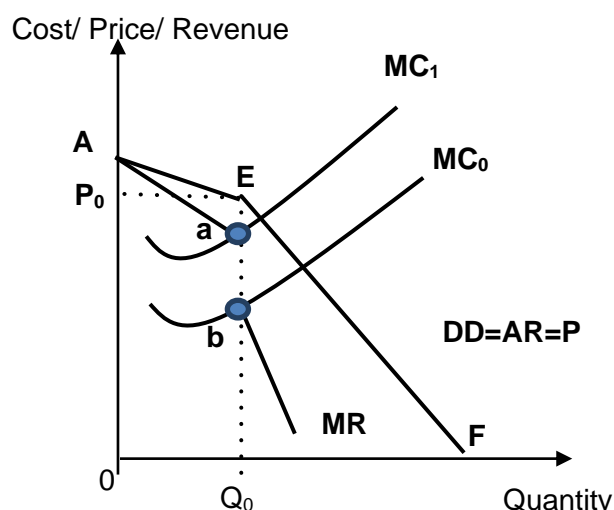
AE portion of the demand curve is **more price elastic than** the **EF** portion.
MR curve has a discontinuous section represented by the vertical gap **'ab'** because At prices above P_0, MR curve corresponds to the more price elastic demand curve, At prices below P_0, the MR curve corresponds to the less price elastic demand curve.
If the MC curve lies anywhere between MC_0 and MC_1 (between gap ab), the profit maximizing price and output will still be P_0 and Q_0.

Figure 19: The Kinked Demand Curve Model

The kinked demand curve model explains the decision making behind the behaviour observed among competitive oligopolies. **The firm tends <u>not</u> to change prices once it has been set**, i.e. there is price rigidity. The kinked demand curve model helps to explain why charging the same price is in line with firms' profit – maximizing interest in an oligopoly market structure, where there is mutual interdependence and high rival consciousness. It also explains how oligopoly prices are stable <u>even without collusion among firms.</u>

Only if the oligopolist's costs change **significantly such that MC shifts out of the vertical gap 'ab'** will the firm be forced to alter its output or price.
As a result, oligopolistic firms do not compete based on prices but prefer to engage in **non-price competition.**

Should firms engage in **price competition**, there will be successive rounds of undercutting that will lead to a **price war** which is detrimental to all firms in the market.

Note:
Students do <u>not</u> need to draw the 'kinked demand curve' model in examinations.
Students only need to explain why large firms, e.g. oligopolistic firms, may refrain from price competition as it may be ineffective due to mutual interdependence and rival consciousness. This is because a fall in price would cause the firm to face a *price inelastic demand curve* as rival firms would match the price cuts. Therefore, the *quantity demanded* for its product would *rise less than proportionately*, causing the *total revenue to fall*.

7.2.4 Monopolistic Competition.

> **Definition**:
> A ***monopolistic competitive*** market structure is one where there are many firms and freedom of entry into the industry, but where each firm produces a differentiated product and thus has some control over its price.

Most real-world markets lie between the two extremes of perfect competition and monopoly. Monopolistic competition is a market structure that embodies elements of both monopoly and perfect competition elements. It is, however, considered a model of **imperfect competition**.

Monopolistic competition is characterised by a **large number of small firms** competing with one another by selling slightly **differentiated products**. Because of its differentiated products, each firm has some degree of market power, i.e. each firm has some discretion as to what price to charge for its products.

Examples of firms operating in monopolistic competition include neighbourhood bakeries, boutiques and hairdressing salons.

Characteristics of Monopolistic Competition

Low barriers to entry

Low barriers to entry mean that the costs of establishing oneself in the industry are low, making it easier for firms to enter the industry. If existing firms earn supernormal profits, then new firms will be attracted to and can easily enter the industry.

A large number of Small Firms

There are many small firms such that no single firm can dominate the industry, since each has an insignificant share of the market – an element similar to the perfect competition market structure. Moreover, there is an **independence of firms where the decisions of one firm have an insignificant effect** on its competitors, as opposed to the oligopoly. This is reflected in firms' decision-making – each firm determines its price-output decision without considering the possible reactions of rival firms. This is particularly true of small retail shops, e.g. neighbourhood grocery stores, coffee shops, barbershops, dry cleaners and hawker food stalls.

> **Note:**
> Unlike oligopolistic firms with high rival consciousness and mutual interdependence, monopolistic competitive firms are ***relatively independent***. As a result, each firm has a minimal market share and limited impact on rival firms.

Differentiated Product

Product differentiation distinguishes monopolistic competition from perfect competition. Instead of producing a homogeneous product, each firm produces a product or provides a service that is different in some ways from others.

Products are differentiated in terms of *packaging, quality, design, branding,*

after-sales services, location and *promotion*.

As a result of selling differentiated products in a market with some barriers to entry, each firm has some degree of control over its own prices, i.e. it is a price setter. This means that firms can raise the price of its product without losing all its customers to its competitors, as in the case of perfect competition. Hence, the monopolistic competitive firms are price-setting firms that face a **downward-sloping demand curve.**

However, the demand is **relatively price elastic** as rival firms produce many close substitutes. This severely limits the "market power" of each monopolistic competitive firm. Therefore, to maintain market power, the firms must ensure that their products are clearly differentiated.

Relatively independent behaviour of monopolistic competitive firms

Contrary to oligopolistic firms with high rival consciousness and mutual interdependence, monopolistically competitive firms are **relatively independent**. Due to a large number of firms, each firm has an insignificantly small share of the market, and therefore its actions are unlikely to affect its rivals to any great extent. This means that when each firm makes its decisions, it does not have to worry about how its competitors react. It assumes that what its rivals choose to do will not be influenced by what it does.

Key Behavioural Features of Oligopolistic and Monopolistic Competitive Firms:

Oligopoly	Monopolistic Competition
Mutually interdependent due to high rival consciousness → tendency to collude with other firms (**Section 8.6**)	Relatively independent → unlikely to collude with other firms

Self-Assessment 7
Compare the characteristics of a monopolistic competitive market structure with that of the other market structures.

8. Firms' Strategies

In this section, we will assume that firms seek to increase profits by:
- Raising average revenue (AR); and/ or
- Reducing average cost (AC).

These strategies can be categorised into:

Non-Price Strategies (Cost & Product Differentiation)	Price Strategies
8.1. Growth 8.2. Diversification 8.3. Shutdown 8.4. Innovation and R&D 8.5. Marketing 8.6. Collusion with other firms	8.7. Price competition 8.8. Price discrimination

For each of these pricing, cost & product differentiation strategies, we will analyse:
• Their effectiveness in helping the firms to increase AR and/ or reduce AC to improve firms' profits; and
• Whether they are more applicable for larger or smaller firms.

8.1 Growth

The first strategy that firms can do to increase their profits (by raising revenue or lowering costs) is to pursue **growth**. (Recall the firm's objective: To maximise profits). There are two methods by which firms may grow: internal or external.

MAIN METHODS FOR FIRMS TO GROW		
Internal growth	**External growth**	
The firm increases its size by producing more of its *existing products or extending its range of products*.	The firm grows when it *joins another firm* to form a larger firm. This means that the growth is much faster than internal expansion. This can be achieved through (i) mergers and (ii) acquisitions.	
	Mergers (or integration)	**Acquisitions**
	This occurs when *two firms mutually agreed to merge* to form a single and larger organisation.	Acquisitions or takeovers occur when a firm's management makes a direct offer to the owners or shareholders of another firm to acquire a controlling interest in the new entity.
	E.g. Merger of Exxon and Mobil to form ExxonMobil.	E.g. Facebook's acquisition of Instagram & Whatsapp

Different forms of Mergers & Acquisitions (M&A)		
Vertical Integration *(to be classified under 'Diversification Strategy' in Section 9.2)*	**Horizontal Integration** *(classified under 'Growth Strategy' in this section)*	**Conglomerate Integration** *(classified under 'Growth Strategy' in this section)*
Vertical integration occurs when firms at different stages of a good's production process join together to form a larger firm. This will be explored under the strategy of **Diversification** (see Section 8.2).	Horizontal integration occurs when firms at the ***same*** stage of the production process and in the same industry merge.	Conglomerate merger takes place when firms from ***totally different industries*** merge. These firms do not share similar products or services. The objective of this type of merger is greater diversification to reduce risks.
	Examples: 1998 merger of the two largest energy corporations in the US, Exxon and Mobil, to form ExxonMobil. 2002 merger between Hewlett-Packard and Compaq under the HP brand in the IT market.	**Example**: In 2021, Indonesia's leading firms Gojek (ride-hailing) & Tokopedia (eCommerce) merged to firm GoTo – one of the world's largest technology group and the first platform in Southeast Asia to combine e-commerce, on-demand services & financial services.

The following table will help students analyse the positive and negative impact of the above strategy of GROWTH on the AC and AR of firms before linking it to profits.

Impact of Growth on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	Expansion through growth can help the firms reap more internal economies of scale to reduce their AC if they initially produce *an output lower than the minimum efficient scale (MES).* *[See Section 4.2.1 for a detailed explanation of iEOS & Section 4.4 for a recap of MES]*	However, excessive growth *beyond the MES* can cause the firm to reap internal diseconomies of scale and hence may cause <u>**AC to rise**</u>. *[See Section 4.2.1 for a detailed explanation of iDOS & 4.4 for a recap of MES]*
Average Revenue (AR)	Growth (i.e. output expansion) enables a firm to capture market share → greater demand for the firm's product + lower PED due to fewer rival firms → increased market power → firms can set higher prices → <u>**increase AR**</u>.	Excessive growth and expansion without meeting consumers' needs mean that <u>**DD=AR of the firm will not increase**</u>. E.g. One of the reasons for the failure of Forever 21 was its over-expansion of stores from 7 to 27 countries in 6 years when consumers were pivoting away from physical stores to online shopping. The expansion did not help to increase DD=AR. Other examples are Google's acquisition of Motorola and Microsoft's acquisition of Nokia to enter the mobile phone market. However, they could not keep up with competitors in meeting consumers' demands, and both Microsoft and Google eventually got rid of the acquired firms.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AC decreases and • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • AC increases and • AR may not increase, The firm's profits will decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the GROWTH strategy for larger and smaller firms based on the FEAST framework.
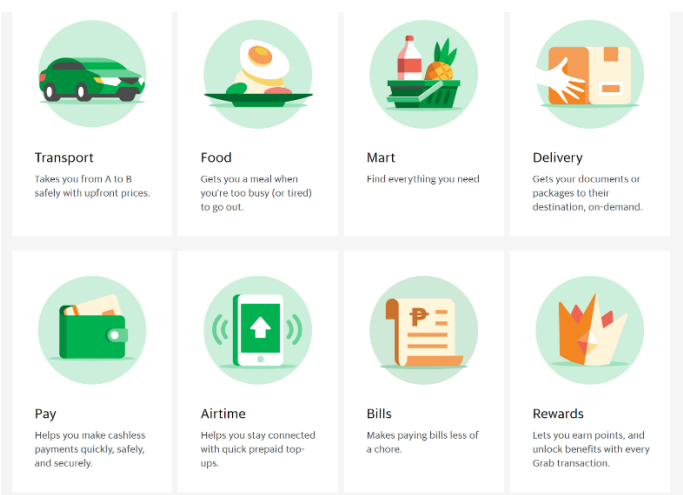
Analysis of Growth strategy using F.E.A.S.T.	Application of Growth Strategy to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated / more competitive industries (e.g. Monopolistic Competition)**
Feasibility	- More feasible for larger firms with the resources to acquire other firms and undertake integration costs (e.g. legal processes, integrating IT systems etc). - Due to high rival consciousness and mutual interdependence, oligopolistic firms, which have colluded under the cartel or price-leadership model, are less likely to use price competition. Instead, they tend to use non-price competition strategies like GROWTH instead.	Less feasible for smaller firms with limited resources to pursue mergers & acquisitions.
Effectiveness	- There is usually greater scope for iEOS to be reaped for firms in less competitive industries (E.g. oligopolies) where MES is at a larger output; hence there is greater scope to reduce AC - In less competitive industries where there are fewer rival firms, there is greater room for firms to grow and wrestle a more significant market share to increase DD, reduce PED→ increase P → significant increase in AR (See **Section 4.4**).	- Firms usually remain very small in more competitive industries (e.g. monopolistic competition) as there is limited scope for iEOS to be reaped, and the MES is generally at a lower output; hence growth provides little scope for reducing AC. - In highly competitive industries, there are so many rival firms that it would be difficult for a firm to grow to significantly increase its market share and market power, e.g. even if two firms were to merge in highly-competitive industries, the combined market share of the merged firm would still be tiny relative to the size of the market → limited increase in AR despite the merger of firms.
Addressing Root Cause (target both AC & AR)	Growth as a strategy can help all firms enjoy both cost and revenue advantages to raise profits holistically.	
Side Effects	Growth can help firms reap the benefits of diversification (see **Section 8.2**) though there could also be downsides.	

Time Lag	External growth through M&A can be much faster to pursue than internal growth and hence more likely to be undertaken by larger firms with the resources.

8.2 Diversification

Diversification enables a firm to **achieve new sources of revenue** and spread its risks as losses incurred for one product can be **offset** by **profits earned from another**. Apple is an example of a firm that diversified from computers to other products: iPhone, iPad, Apple Watch, Apple Music, AppleTV etc.

Super Apps that have diversified to meet diverse consumer needs within a single app are great examples of such diversification:

Super Apps	Diversified business segments of Super Apps
Grab (Singapore)	
Sea Ltd (Singapore)	

WeChat (China)	

> **Definition:**
> **Economies of scope** refer to cost reductions when a firm increases the range of products.

Diversification also allows a firm to enjoy economies of scope when different aspects of costs of production can be spread over more output when a firm has a wider range of products:

Cost of inputs/ FOPs	Kleenex manufactures many paper products for various users, e.g. Huggies diapers, facial tissues, feminine hygiene products, paper towels and hospital surgical control; products. All these products utilise similar raw materials and/or manufacturing processes, and hence Kleenex is about to reduce its cost of production.
Cost of advertising	Companies like Samsung create a wide range of products that benefit from having a common premium brand image that customers trust. Firms can spread the costs spent on promoting a firm's brand over a greater output level if it has a broader range of products. E.g. the Samsung brand is attached to products ranging from smartphones, air conditioners, TVs and other electronics.
Cost of R&D	Dyson spreads its cost into the R&D of its motor technology over a broad product line: vacuum cleaners, hand dryers, fans, hair-dryers etc.
Cost of operations	Passenger airlines frequently transport freight cargo underneath the plane. This optimizes the use of the aircraft, the fuel, and the flight crew already needed to run a passenger flight.

Lastly, diversification includes **vertical integration**. This allows the firm to secure access to retail markets or production inputs, thus benefiting from reduced risks, increased sources of revenue, and greater economies of scope.

Vertical Integration
Vertical integration takes place when a firm merges with or acquires another firm in the same industry but at a different stage of production. It can be forward or backward vertical integration:

Forward Integration	Backward Integration
Involves the firm merging with another firm at the ***succeeding stage of production*** (moving closer to the retail outlet or consumers).	Occurs when a firm merges with another firm at the ***previous stage of production*** (moving up the supply chain). This creates a stable supply of inputs and ensures consistent quality in the final product.
Example: Amazon was already a major wholesaler and eCommerce platform. It acquired Whole Foods (a sizeable American supermarket chain) in 2017, and this provided Amazon with 'brick and mortar' stores where it could sell its products directly and physically to consumers across the US in Whole Foods' stores.	**Examples:** Netflix is known for its online streaming platform. It has been acquiring production companies, e.g. German visual effects company – Scanline, as it seeks to boost its production of Netflix Original titles to be streamed on its platform rather than to be wholly dependent on purchasing titles from other production companies. Similarly, Amazon has purchased publishing houses to directly supply book titles to its online marketplace.

The following table will help students analyse the positive and negative impact of the above strategy of DIVERSIFICATION on the AC and AR of firms before linking to profits.

Impact of Diversification on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	Diversification can help firms enjoy economies of scope that help firms **reduce their AC**.	Diversification can **increase the cost** for firms, e.g., developing new product lines or spending on marketing in new geographical markets. For example, Dyson abandoned plans to venture into the electric vehicle market, citing the high R&D costs.
Average Revenue (AR)	Diversifying into different markets by launching different product lines or entering different geographical markets can help firms to increase market share → increase DD for firms' products → set higher prices → enjoy **higher AR**.	Diversification may not help increase AR if it fails to cater to consumers' tastes and preferences and stimulate demand. E.g. Coca-Cola's foray into the wine industry or Google Glass, Facebook Phone (2013), and Amazon's Fire Phone (2014) are examples of diversification that did not appeal to consumers' demand and **failed to raise AR** for the firms.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AC decreases and • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • AC increases and • AR may not increase, The firm's profits will actually decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the DIVERSIFICATION strategy for larger firms and smaller firms based on the FEAST framework

Analysis of Diversification strategy using F.E.A.S.T.	Application of Diversification Strategy to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated/ more competitive industries (e.g. Monopolistic Competition)**
Feasibility	- Easier for larger firms with more resources - Due to high rival consciousness and mutual interdependence, oligopolistic firms that have colluded under the cartel or price-leadership model are less likely to use price competition. Instead, they tend to use non-price competition strategies like this instead.	It is more problematic for smaller firms due to the relative lack of resources. However, they could do low-cost diversifications, e.g. restaurants expanding their menu options or diversifying their concepts, e.g. Astons Specialties, Astons Steak & Salad, Andes by Astons, Chic A Boo by Astons etc.
Effectiveness	Successful diversification can help larger firms lower the contestability of a market, i.e., making it harder for new entrants to enter the market as they cannot match the same range of products → enable the incumbents to potentially earn higher profits in the long run.	As smaller firms tend to undertake low-cost and superficial diversifications, these may not have a significant impact on helping smaller firms to increase their market share. Competitors could easily replicate such strategies and prevent substantial increases in market share.
Addressing Root Cause (targeting both AC & AR)	Diversification as a strategy can help all firms enjoy both cost and revenue advantages to holistically raise profits.	
Side Effects	-	-
Time Lag	Diversification, especially when involving vertical integration, takes time. This may mean that the costs of diversification would outweigh the benefits in the short run, resulting in subnormal profits.	Smaller firms that undertake more low-cost diversifications may experience less time lag than larger firms.

8.3 Shutdown

Despite firms' best efforts to increase AR and reduce AC, in the short-run, they may still be making subnormal profits (where AR<AC or TR<TC) (see **Section 6.3**) when producing at the profit-maximisation output. In such cases, firms may seek to **minimise losses by considering whether to shut down**.

(i) Short Run

Recall:
- There is at least one fixed factor of production in the short run.
- Hence, Total Cost = Total Fixed Cost + Total Variable Cost.
- Fixed costs do not vary with output, while variable costs are costs that do.

When the firm is making sub-normal profit:
- Total revenue is less than total cost (TR < TC); or
- Average revenue is less than average total cost (AR < AC)

In the short run, a firm earning subnormal profits still has to pay its fixed costs regardless of output level (i.e. whether it shuts down and output is zero or it continues production). **Therefore, in considering whether it should shut down, the firm does <u>not</u> consider fixed costs. Instead, the firm considers its variable costs.**

Important:
In the short run, whether the firm continues production or shuts down immediately depends on whether its total revenue (TR) can cover at least its total variable cost (TVC) or average revenue (AR) can cover the average variable cost (AVC).
- The firm will continue to produce as long as TR covers TVC or AR covers the AVC.
- The firm will shut down if the TR is less than the TVC or AR<AVC.

Let us examine three cases where losses can be minimised in the short run. The assumption is that firms are producing at an output level where profit is maximised, i.e., marginal cost equals marginal revenue (MC = MR).

Case 1 (TR > TVC or AR > AVC)

TFC	$10 000	Price per unit	$24
TVC	$20 000	Quantity	1 000
TC	$30 000	TR	$24 000

In Case 1, the firm earns subnormal profit because the total revenue ($24,000) is lower than the total cost ($30,000). If the firm:
- Continues to produce, it incurs TVC and TFC, and its losses will be **$6,000** or
- Chooses to shut down, its losses will be the TFC of **$10,000** as the firm will continue to incur TFC even when output is 0, but TVC will be 0.

Since TR>TVC, to minimise losses, the firm will continue to produce 1,000 units in the short run. This is because the revenue earned is more than its variable costs, as the surplus generated can be used to offset part of its fixed costs.

Case 2 (TR < TVC or AR < AVC)

TFC	$10 000	Price per unit	$9
TVC	$20 000	Quantity	1 000
TC	$30 000	TR	$9 000

In Case 2, the firm earns subnormal profit because TR ($9000) is lower than TC ($30,000). If the firm:
* Continues to produce, it incurs TFC + TVC, and its losses will be $21,000; or
* Chooses to shut down, its losses will be the TFC of $10,000 as the firm will continue to incur TFC even when output is 0, but TVC will be 0.

Since TR<TVC, to minimise losses, the firm will shut down immediately so that its losses are limited to only the fixed costs instead of making losses on both fixed and variable factors.

Case 3 (TR = TVC or AR = AVC)

TFC	$10 000	Price per unit	$20
TVC	$20 000	Quantity	1 000
TC	$30 000	TR	$20 000

In Case 3, the firm earns subnormal profit because TR ($20,000) is lower than TC ($30,000). If the firm:
* Continues to produce, it incurs TFC + TVC, and its losses will be $10,000; or
* Chooses to shut down, its losses will be the TFC of $10,000 as the firm will continue to incur total fixed costs even when output is 0, but TVC will be 0.

Whether the firm continues production or shuts down, the losses would be the same.

However, in this case, since TR=TVC, the firm may choose to continue production and not to shut down due to several possible reasons:

* The producer may be optimistic and hope that the price and/or quantity sold or profits will increase in the future; and/or
* The producer may want to preserve his/her reputation. However, if the firm were to close down, s/he might have problems re-starting business again.

Summary of Short Run Shut Down Condition

(Case 1) SR Sub-Normal Profit	But TR > TVC (or AR > AVC)	Continue production
(Case 2) SR Sub-Normal Profit	And TR < TVC (Or AR < AVC)	Shut down
(Case 3) SR Sub-Normal Profit	But TR = TVC (Or AR = AVC)	Continue production or Shut down
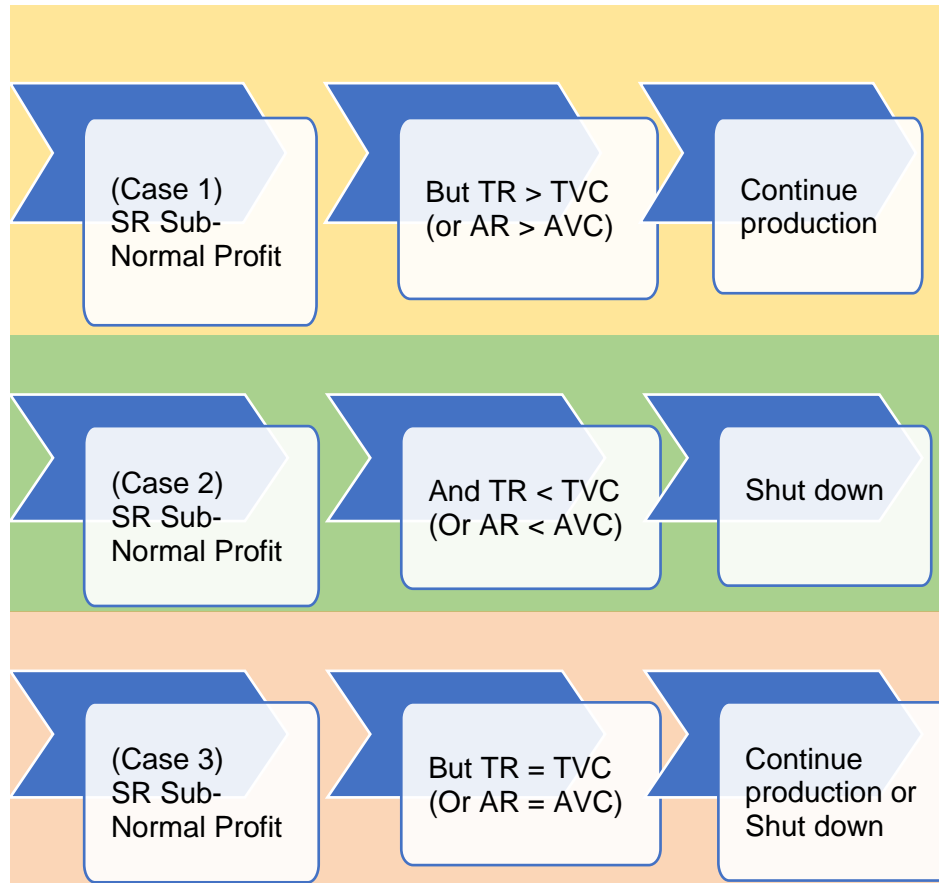
(ii) Long Run

In the long run, all costs are variable, and the firm only needs to consider whether its total revenue is able to cover total costs.

Case 1: If the firm makes subnormal profit in the long run, i.e. average revenue (i.e. the price of the product) does not cover the average costs of production in the long run, the **firm would shut down and leave the industry.**
- If it continues to operate, it will make losses due to the subnormal profits.
- If it shuts down, losses will be zero because it does not incur fixed costs in the long run. Therefore, *to minimise losses*, firms should shut down.

Case 2: However, if the firm makes at least normal profit in the long run, i.e. average revenue can cover the average cost, the **firm would continue to operate.**

Summary of Long Run Shut Down Condition

(Case 1) Sub-normal Profit	→	TR < TC (or AR < AC)	→	Shut down and leave the industry
(Case 2) Supernormal/ Normal Profits	→	TR ≥ TC (or AR ≥ AC)	→	Continue production

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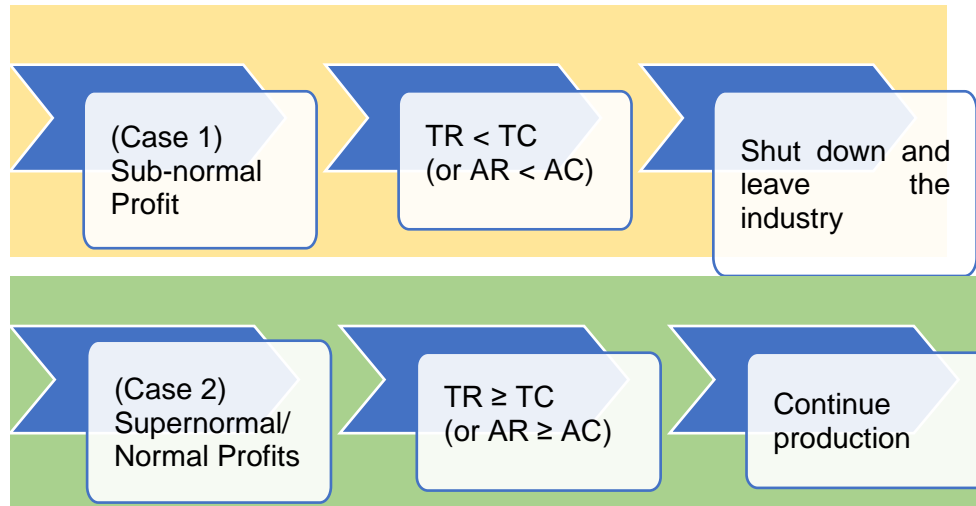
Succinct explanation of shut-down condition to minimise losses:

When a firm is making sub-normal profits in the **short run**,it needs to decide whether to continue producing or shut down to minimise its losses.

- 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 onboth fixed and variable factors.

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

Note:

'Shutdown' as a strategy is a used to minimise losses rather than to increase profits. It applies to both smaller and larger firms.

As such, we will not be using the FEAST framework or smaller vs larger-firm framework to analyse this strategy.

Self-Assessment 8

1. Under what profit condition will a firm shut down?

2. How do fixed costs affect the decision to shut down?

3. How do variable costs affect the decision to shut down?

4. What is the shutdown condition?

5. Should the firm continue production if it earns normal profit? Why?

8.4   Innovation and Research & Development (R&D)

Innovation refers to the efforts put in by a firm to come up with new, improved or differentiated products with Research & Development (R&D). If successful, this will raise its market power, thus enabling it to earn higher revenue.

(i) **Product Innovation** aims to increase the firm's DD=AR and reduce the PED of its product by introducing new products or features.

Examples: Many of the most profitable firms in the world are also the most innovative that develop cutting-edge products that appeal to the demand of consumers in the market, e.g.:

1. Apple
2. Alphabet (parent company of Google)
3. Amazon
4. Microsoft
5. Tesla
6. Samsung
7. IBM
8. Huawei
9. Sony
10. Pfizer

Source: Most Innovative Companies 2021 by BCG

(ii) **Process Innovation** raises productivity or lower costs. Innovation can be low-cost (e.g. improving the packaging of the product) or may involve costly research and development (R&D), especially if it is technology related.

Examples:
- Amazon uses automation to reduce that automates the process of picking orders with robotic systems to increase the orders dramatically it can process in a given amount of time and reduce the cost of fulfilling orders
- Aeroplane makers like Boeing and Airbus continuously develop new planes that use lighter materials and less fuel to reduce the cost of production and operation.

The following table will help students analyse the positive and negative impact of the above strategy of INNOVATION and RESEARCH & DEVELOPMENT on the AC and AR of firms before linking it to profits.

Impact of Innovation on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	Cost/process innovations that help to reduce the cost of production can help to **reduce AC**.	Firms may incur high costs to develop, introduce and implement cost innovations, e.g. automation systems and robotics that can cause **AC to rise in the short run** although the AC would fall in the long term. R&D efforts to develop innovations require hiring human talent that can be **very costly,** and the **R&D may not be successful**.
Average Revenue (AR)	Innovations, e.g. new designs, can appeal to consumers' taste & preferences → stimulate demand + reduce PED due to rising uniqueness of products → increase the market power of firms → increase P → **increase AR**	Innovations **may not reap the intended revenue advantages** if they cannot keep up with competitors or fail to appeal to the dynamic needs of consumers. E.g. mobile phone makers like Nokia, HTC and Motorola were not able to innovate as successfully as their competitors.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AC decreases and • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • AC increases and • AR may not increase, The firm's profits will decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the INNOVATION and RESEARCH & DEVELOPMENT strategy for larger firms and smaller firms based on the FEAST framework

Analysis of Innovation and R&D strategy using F.E.A.S.T.	Application of Innovation and R&D Strategy to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated / more competitive industries (e.g. Monopolistic Competition)**
Feasibility	- Larger firms have greater market power due to higher demand (because of greater market share) and lower PED (because of fewer rival firms) → can set higher prices → enjoy greater AR over time → greater ability to invest in *extensive* innovations - Due to **higher barriers to entry** in less competitive markets, firms able to maintain LR supernormal profits → greater ability to invest in *extensive* innovations *(see analysis above)* - Due to high rival consciousness and mutual interdependence, oligopolistic firms that have colluded under the cartel or price-leadership model are less likely to use price competition. They tend to use non-price competition strategies like this instead.	- Smaller firms have lower market power due to lower demand (because of smaller market share) and higher PED (because of more rival firms) → set lower prices → derived lower AR over time → inability to invest in extensive innovations. - Due to **lower barriers to entry** in more competitive markets, firms are only able to make normal profits in the LR in this industry → lack of ability to innovate *(see table on contestability in Section 7.1.1)* - Innovations tend to be more **low-cost & superficial**, e.g. improvements to the packaging of products
Effectiveness	- More likely to be effective for larger firms that have greater ability to invest in the resources (e.g. human talent) needed to innovate & can persist until innovations succeed successfully - Successful innovation can help firms lower the contestability of a market, i.e. make it harder for new entrants to enter the market (enable the incumbents to potentially earn higher profits in the long run. - Also depends on how whether firms can stay ahead of innovation competition among rival firms -	- Less likely to be effective for smaller firms that lack resources to invest in R&D resources or persist till there are positive results - Small firms tend to focus on low-cost innovations that may not reap significant revenue advantages

Addressing Root Cause (targeting both AC & AR)	Innovation as a strategy can help all firms enjoy both cost and revenue advantages to holistically raise profits.
Side Effects	Innovations could have a positive impact on social welfare by reducing the negative externalities from production/ consumption, e.g. develop of more energy-efficient cars, planes and appliances → reduce allocative inefficiency (see **Section 10.1**)
Time Lag	Extensive innovations typically require trial and error and a long time for results to be seen.

8.5   Marketing

Marketing refers to efforts taken by the firm to promote its product. This largely takes the form of advertising although it can be also done through other means, e.g. free gifts, free samples and lucky draws.

Advertisements include:

1. **Informative advertising:** where a firm informs consumers about the prices of its products, the tangible characteristics of its products, or the locations and conditions of sale.

2. **Persuasive advertising** tries to convince customers that the advertised product is superior to its alternatives in terms of quality or desirability.

Marketing and Cognitive Biase

(i) Salience Bias

Marketing can enhance the effectiveness of other strategies, e.g. innovation, as it enhances consumers' **salience bias**.

> **Definition:**
> *Salience bias* refers to the tendency for people to focus on more prominent information over other less prominent but equally relevant pieces of information.

For example, a TV manufacturer may decide to highlight through its marketing that its products have higher resolution screens (based on the innovation strategy) compared to equivalent models by its competitors. Some consumers may then decide to buy this brand of TV even though the difference in resolution may not be perceptible to the naked eye and the other aspects of the product like the sound, power consumption, user interface and connectivity may be inferior to the other brands → increase market share and demand + reduce PED due to perceive uniqueness → higher prices → higher AR.

(ii) Loss Aversion

> **Definition:**
> *Loss aversion* refers to the tendency for people to prefer avoiding a loss over making an equivalent or greater gain.

Firms can take advantage of loss aversion through marketing, e.g. free trial periods. Once a consumer has the product, it becomes more challenging to give up something one has gotten used to. For example, a supermarket may offer a free month trial for free delivery. When we get accustomed to enjoying free delivery of groceries, we do not want to give it up. So we will be willing to pay for a subscription model to continue enjoying free delivery.

In terms of marketing of products, the exact change in price framed differently, for example, as a $5 discount (a gain of $5) or as a $5 surcharge avoided (a loss of $5 avoided), will be perceived differently and will have a significant effect on consumer behaviour. Therefore, based on the concept of *loss aversion*, a discount that is marketed as a chance to avoid losses would be more effective than being marketed as a gain/ benefit to consumers.

In another example, telecommunications providers often require their customers to sign contracts whereby early termination results in losses due to the payment of termination fees. Such strategies enable these firms to retain their customers. The customers may not want to break their current contracts and incur losses due to termination fees even though they may gain more by switching over to other providers that offer cheaper rates.

(iii) Sunk Cost Fallacy

> **Definition:**
> ***Sunk cost fallacy*** arises when a person's decision is affected by fixed rather than marginal costs.

The sunk cost fallacy may, in part, occur due to loss aversion. It is a vicious cycle because we, as economic agents, continue to invest money, time and effort into endeavours that we have already invested in. The more one invests, the more one feels committed to continuing the endeavour, and the more resources one is likely to put it to follow through on our decision. Such decisions are typically irrational and lead to suboptimal outcomes. In such a scenario, firms are focused on their past investments instead of their present and future costs and benefits. As economic agents, we commit ourselves to decisions that may no longer be in our best interests.

For example, a firm, in its marketing efforts, may try to get its customers to sign up and pay to become a member of its loyalty programme, as this may cause these customers to be more inclined to buy from the firm subsequently as they may feel more compelled to spread out the cost of the membership fee (i.e. the sunk cost).

E.g. Deliveroo's Deliveroo Plus programme gets consumers to subscribe to a $12.90/ month charge for free delivery on orders. Consumers who have subscribed are more likely to use Deliveroo for their deliveries to spread out the sunk cost of subscription fees over a larger number of orders a month.	

The following table will help students analyse the positive and negative impact of the above MARKETING strategy on the AC and AR of firms before linking it to profits.

Impact of Marketing on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	Nil	Marketing campaigns can be **costly** to undertake, e.g. hiring celebrities or influences. These can cause **AC to increase** and reduce profits in the short run.
Average Revenue (AR)	Marketing can allow firms to enjoy greater market power to set higher prices and **increase AR** in the long run because: - It could influence consumers' tastes and preferences and stimulate demand for its products →increasing the market share of the firm - Salience bias → increase market share, DD and lower PED - Develop brand loyalty → Increase the sense of uniqueness of the product → reduce PED	Marketing requires time to change consumers' perceptions and tastes, and preferences. Many companies benefit from marketing due to long-term sustained spending on campaigns, e.g. Coca-Cola. The impact on market share, demand for the firm's product, and AR may be limited in the short run.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • AC increases and • AR may not increase, The firm's profits will decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the MARKETING strategy for larger firms and smaller firms based on the FEAST framework

Analysis of Marketing strategy using F.E.A.S.T.	Application of Marketing Strategy to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated / more competitive industries (e.g. Monopolistic Competition)**
Feasibility	- Larger firms usually have the ability to launch extensive and sustained marketing campaigns due to their higher market power and ability to enjoy higher AR and profits. - Due to high rival consciousness and mutual interdependence, oligopolistic firms that have colluded under the cartel or price-leadership model are less likely to use price competition. Instead, they tend to use non-price competition strategies like this instead.	- Smaller firms lack the resources to launch extensive marketing campaigns. The extent of advertisements undertaken by smaller firms may only be limited to the cheaper forms of advertising, such as through the distribution of flyers or by word-of-mouth.
Effectiveness	- The marketing campaigns of larger firms are usually more effective and influential due to the resources they can dedicate - Successful marketing can help larger firms to raise **BTE** (due to brand loyalty) lower the contestability of a market, i.e. make it harder for new entrants to enter the market as they compete with incumbents with high brand loyalty from customers→ enable the incumbents to earn higher profits in the long run potentially. - However, the success of marketing campaigns is not just based on the scale of resources but the sensitivity to consumers' perceptions - Marketing campaigns may not be able to raise demand if the quality of products is poorer than rival firms.	- Less likely to be effective or have a significant impact due to the small scale of marketing

Addressing Root Cause (targeting both AC & AR)	Marketing can only potentially help firms to raise AR, and it causes AC to increase too. There will only be a positive impact on profits if the increase in AR is greater than the increase in AC.
Side Effects	Extensive marking campaigns could be costly for firms to implement, and these could cause the AC of firms to rise significantly. If this rise in AC outweighs the increase in AR, firms may experience an unintended consequence of a fall in profits.
Time Lag	Marketing campaigns influence consumers' tastes and preferences that may take a long time to change. As such, these strategies may not work quickly.

8.6   Collusion with other Firms

Definition:
Collusion refers to the situation where firms in a market cooperate to jointly fix prices or output.

Firms collude to avoid competition. This helps to reduce uncertainty faced in the form of competitive price cutting or retaliatory advertising, which could potentially cause decline in profits for all firms in the same industry.

Collision can be:
- Explicit in form of cartels; or
- Tacit[5] in the form of price leadership.

8.6.1   Explicit Collusion – Cartel

Firms may enter into formal agreements that lay out the market price they should charge, the output of each firm etc. Firms in formal collusive agreements form a **cartel.** Essentially, a cartel acts like a monopoly as they aim to maximise collective profit.

One of the well-known cartels is the Organisation of Petroleum Exporting Countries (OPEC). Because open collusion is an anti-competitive business strategy, it is prohibited in most countries.

Suppose the firms in a market establish a cartel; the cartel acts **as if it were a monopoly** operating many plants.

Like a monopoly, the cartel needs to make decisions on price and output. **Figure 20** illustrates the equilibrium output, price and profit of a cartel seeking to maximise profit.

The cartel's demand curve is the AR curve. The marginal cost curve is the horizontal sum of the individual marginal cost curves for all firms in the cartel.

Profit is maximised at output Q_0 where MC = MR, and the cartel's price is P_0. At Q_0, the cartel makes supernormal profit represented by area P_0ABF.

The members will then decide how to allocate the total output of Q_0 among them. Usually the level of each member's quotas is allocated according to their current market share.

Figure 20: Profit Maximising Cartel

[5] 'Tacit' means understood or implied without being stated.

Note:
In a cartel, all firms charge the same price (unless individual firms 'cheat') but may not be producing the same output level.

For example, Saudi Arabia, the de facto leader of OPEC, produces almost a quarter of the cartel output, whereas Algeria produces only 1%.

Self-Assessment 9
Explain the difference between collusion and a merger.

The collapse of cartels due to cheating behaviour by firms

Recall:
- In a cartel, all firms agree to set the same price, but the output that each firm produces is based on an agreed allocation that is usually unequal. Often, smaller firms are allocated a smaller output than they can produce.

As such, members of a cartel might be incentivised to cheat by producing more than its allocated quota to be sold at the high price set by the cartel. It will benefit the cheating firm as its revenue, and, therefore profits earned increase.

Collusion collapses when one or more of the firms involved cheat by charging less or producing more than the agreed price or output, respectively. This often results in price wars which may lead to huge losses for all firms involved.

Example:
In 2001, the coffee bean cartel, the Association of Coffee Producing Countries, whose members produce 70% of the global supply, was disbanded. The failure of member countries to comply with the cartel's production levels was an important reason for its collapse.

13 fresh chicken distributors fined record S$26.9m for price fixing, market sharing

Thirteen fresh chicken distributors that engaged in price fixing and market sharing have been fined a total of S$26.9 million – the highest financial penalty meted out by the Competition and Consumer Commission of Singapore (CCCS) for a single case.

For nearly seven years, the suppliers had discussed and coordinated the amount and timing of price increases ranging from S$0.10 to S$0.30 per kg on at least seven occasions. They also agreed not to compete for each other's customers, said the CCCS on Wednesday (Sep 12).

Supplying more than 90 per cent of fresh chicken products in Singapore, the 13 companies have a total turnover of about S$500 million a year.

Questions
1) What are the economic impacts of price fixing behavior in the markets?

2) How important is the role of the government in influencing firms' behavior?

8.6.2 Tacit Collusion – Price Leadership

As shown so far, collusion drives up prices and producers' profits at the expense of consumers. To protect consumers' interests, many countries have anti-monopoly laws in place that render open collusion illegal**.** For example, the Competition Commission of Singapore (CCS) seeks to promote the efficient functioning of markets in Singapore by curbing anti-competitive activities. In USA and UK, anti-trust legislation forbids open collusive agreements among firms to fix prices or share markets (e.g. the Sherman Anti-Trust Act of 1890). (See **Section 11** for more details of government regulation against anti-competition behaviour by firms).

Hence, firms may **collude tacitly**[6] by watching each other's prices and keeping theirs similar. Doing so allows firms to avoid competition and yet stay within the law. Firms may also tacitly 'agree' to avoid price wars or aggressive advertising campaigns.

One form of tacit collusion is where firms keep to the price that is set by an established leader.
- The price leader may be the largest firm, the firm with the lowest cost or the barometric firm (the first to realise that industry demand or costs have changed).
- The price leader sets the price or changes the price while the rest of the firms in the industry follow.
- The price leader would typically produce at the profit-maximising output based

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[6] Definition of 'tacit':" understood or implied without being stated.

on its MC and MR, i.e. acting like a monopoly.
- The other price-following firms would adjust their output to match the price leader's price.
- Formal agreements are not involved. However, if other firms recognise the barometric firm's ability to detect changing market conditions quickly, they may follow any price change it initiates. This leads to stable prices or an orderly change in the price instead of competitive price cutting.

> **Note:**
> In the price leadership model, all firms charge the same price (based on the price leader's profit-maximising price) but may not produce the same output level.
>
> The price set by the price leader may not allow other firms in the industry to maximise profits because it focuses on its own cost and revenue conditions (i.e. to maximise its profits). However, overall industry profits are likely to be higher than if firms chose to compete.

The following table will help students analyse the positive and negative impact of the above strategy of COLLUSION on the AC and AR of firms before linking it to profits.

Impact of Marketing on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	If a cartel purchases raw materials as a collective whole, the firms in the cartel can also enjoy commercial economies of scale, such as bulk purchase discounts → reduces AC.	Smaller firms may not be able to increase output to reap iEOS that could have helped them reduce AC because: • In cartels, smaller firms tend to be subjected to tighter quota restrictions • Under price leadership, small firms may need to increase output to match the price set by the price leader.
Average Revenue (AR)	Collusion allows firms to set higher prices and enjoy higher AR collectively. It prevents price wars among firms that cause AR to fall.	Cartel may collapse due to cheating behaviour by firms.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AC decreases and • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • AC increases and • AR may not increase, The firm's profits will decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the COLLUSION strategy for larger firms and smaller firms based on the FEAST framework

Analysis of strategy using FEAST	Application of Collusion Strategy to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated/ more competitive industries (e.g. Monopolistic Competition)**
Feasibility	Collusion is more likely to occur and continue if: • The market is more concentrated • There is a clear market leader; and • The extent of product differentiation (e.g. Crude oil) is low & hence prices across firms would be similar. Therefore, such collusive behaviour is more common for oligopolistic firms that are mutually interdependent and have high rival consciousness (see **Section 7.2.3**.) - Due to high rival consciousness and mutual interdependence, oligopolistic firms that have colluded under the cartel or price-leadership model are less likely to use price competition. They tend to use non-price competition strategies like this instead.	Smaller firms in more competitive industries (e.g. monopolistic competition markets) are **unlikely to collude** as they are *relatively independent*. Each firm has such a small market share that firms do not need to consider the behaviour/ actions of other firms (See **Section 7.2.4**).
Effectiveness	Can be effective in helping firms to increase profits. However, firms may resort to *cheating in cartels*, which could cause the cartel to collapse.	
Addressing Root Cause (targeting both AC & AR)	Collusion as a strategy can help all firms enjoy both cost and revenue advantages to raise profits holistically.	
Side Effects	-	
Time Lag	-	

8.7 Price Competition

In terms of price competition, in theory, a firm sets prices where MC=MR to maximise profits. Should costs or demand fall to cause MC or MR to fall respectively, the firm will lower its prices to move to its new profit maximisation position. Factors that may cause a fall in the profit-maximisation price:
- Fall in variable costs that cause a fall in MC (and AC) (e.g. fall in wages/ raw materials);
- Fall in demand for the firm's product (e.g. fall in consumers' income causing demand for normal goods to fall/ increase in the number of competing firms in the market); and
- Firms that are increasing output and reaping more iEOS→ outward shift of DD and MR → downward movement along the AC.

Note: Change in fixed costs, e.g. rent, R&D costs and advertising costs, will not change MC because these costs do not vary with output and MC is affected by a change in costs due to a change in output. A change in fixed costs should only change AC and **not** MC. Therefore, the profit-maximisation price should not change.

These will be explored further in the tutorial worksheet.

However, firms may also lower their prices to earn more revenue if they perceive the demand for their products to be price elastic.
- Recall: when PED>1, firms should reduce their price → quantity demanded increases more than proportionately → increase in TR
- PED of a firm's product may be more than one due to an increase in the number of rival firms that increases the number of close substitutes in the market.

Finally, a firm may **prioritise market share dominance over profit-maximisation.**

Therefore, it may lower its prices to:	
Deter entry of new firms (i.e. **limit pricing**)	Drive out existing competitors (i.e. **predatory pricing**)
Definition: A dominant firm charges a price below the short-run profit-maximising level to deter new entrants.	Definition: A dominant firm sets its prices below average cost to drive competitors out of business.
If the barriers to the entry of new firms are not total, and if the dominant firm is making very large supernormal profits, there may be a danger in the long run of potential rivals breaking into the industry. In such cases, the dominant firm may keep its price down and thereby deliberately restrict the size of its profits in the short run so as not to attract new entrants. Potential entrants are deterred from entering the market as they cannot set a price any higher than this price if they enter the market. However, they are more likely to make subnormal profits if they entered the market at	This practice is most commonly undertaken by oligopoly firms seeking to expand their market shares and gain greater market control. Predatory pricing is often outlawed by antitrust laws, but it can be difficult to prove. When engaging in predatory pricing, individual firms may suffer losses in the ***short run***. Survivors of intense and prolonged price wars are likely to be the firms with the more resources to withstand the price war.

this price.	
Example: Southwest Airlines is the most successful low-cost carrier in the US. It has been observed that incumbent airlines, United and Delta Airlines, would cut their prices significantly when Southwest indicated an interest in starting flying routes that would compete with these incumbent airlines.	**Example**: Grab and Uber, for some time, were engaging in a price war to eliminate competition, which eventually resulted in Grab acquiring Uber's Southeast Asia business.

In the long run, if price competition succeeds in securing market dominance for the firm, it would likely *revert to profit-maximisation*. The firm would be able to set a **higher price** at the new profit-maximisation output due to the:
- Increased and dominant share, the firm would enjoy a higher demand; and
- Reduction in level of competition due to few rival firms causing PED to fall.

The following table will help students analyse the positive and negative impact of the above strategy of PRICE COMPETITION on the AC and AR of firms before linking it to profits.

Impact of Price Competition on firms' AC & AR	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Average Cost (AC)	In the *long run*, price competition that helps the firm increase market share and output could help it reap more iEOS and experience a **fall in AC**.	**No** negative impact on AC in the *short run*.
Average Revenue (AR)	In the *long run*, price competition could help the firm to increase market share → increase market power → set higher profit-maximising price → **higher AR**	In the *short run*, price competition would **reduce AR** and cause profits to fall – firms may even have to sustain subnormal profits.
Link back to Profits (= TR – TC/ AR-AC)	Summary: • AC decreases and • AR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary (in the short run) • AC remains unchanged and • AR will decrease, The firm's profits will actually decrease, i.e. subnormal profits.

The following table will help students analyse strengths and drawbacks of the PRICE COMPETITION strategy for larger firms and smaller firms based on the FEAST framework

Analysis of Price Competition strategy using F.E.A.S.T.	Application of Price Competition to:	
	Larger firms in more concentrated / less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated / more competitive industries (e.g. Monopolistic Competition)**
Feasibility	More feasible for larger firms that have accumulated significant profits from the past and can sustain the decrease in AR and profits due to price competition. Due to high rival consciousness and mutual interdependence, oligopolistic firms that have colluded under the cartel or price-leadership model are less likely to use price competition. They tend to use non-price competition instead.	Less feasible for smaller firms that lack the resources and profits from the past to sustain a decrease in AR and profits due to price competition.
Effectiveness	May not be effective: - In oligopolistic markets based on the 'kinked demand curve' model. Rival firms may match the price cuts of a firm and cause the firm to face a price inelastic demand curve. Therefore, the quantity demanded for its product may rise less than proportionately and its TR falls (See *Section 7.2.3* on Oligopoly); - If rival firms have 'deeper pockets' and can sustain prolonged periods of subnormal profits; and/ or - If rival firms do not need to match the price cuts due to other strategies, e.g. *innovation* that ensures superior product quality and/or uniqueness or *marketing* that reinforce strong brand loyalty. Protracted price wars can lead to the shutdown of firms.	
Addressing Root Cause (targeting both AC & AR)	Price competition mainly seeks to increase AR in the long run. The positive impact on AC in the long run due to iEOS is secondary. The short run impact on AR is negative.	
Side Effects	Predatory Pricing is illegal, and governments may crackdown against such anti-competition behaviour using regulations (see **Section 11**). E.g. in 2011, Delta Airlines was investigated for using such practices to maintain a monopoly position at Minneapolis Airport. However, such methods are difficult to distinguish from other price competition behaviour, and governments find it hard to prove and prosecute in court.	
Time Lag	Length of price competition depends on the resilience of rival firms in sustaining depressed profit levels	

8.8   Third Degree Price Discrimination

We have assumed so far that the firms charge a single price on all units of products that it sells. However, the firm may also find it profitable to practise price discrimination.

Definition:
Price discrimination occurs when a producer sells the same commodity to different buyers at different prices **for reasons not associated with differences in cost.**

Conditions necessary for successful price discrimination

In order to have an opportunity to price discriminate, the following three conditions have to be met:

a) Price elasticities of demand differ for different markets;
b) The markets can be effectively segmented; and
c) There is limited resale (or seepage between markets).

a)   Different Price Elasticity of Demand in the Separate Markets

The various segments of the market should have varying degrees of price elasticity of demand, i.e. the different groups of consumers react differently to price changes. The group of consumers whose demand is relatively price inelastic can be charged a higher price compared to the group whose demand is relatively price elastic.

b)   Market Segmentation

The firm must be able to segment the market by classifying buyers into separate, identifiable groups.
- For instance, public transport service providers can classify passengers based on their age into students, elderly and regular passengers. Students and the elderly can be verified through IDs to enjoy concessional fares.
- Another example is electricity users, who can be distinguished into households and business units. Again, this is because the specific use is based on the types of buildings, whether residential or industrial/commercial buildings.

c)   Not Possible for Resale between Markets

For price discrimination to be successful, it must not be possible for buyers to resell goods at a higher price in another market. E.g. it must be made impossible for students to be able to resell a half-priced student movie ticket to an adult for use.

Third-Degree Price Discrimination

There are three different types of price discrimination, namely:
- i)   First-degree price discrimination
- ii) Second-degree price discrimination and
- **iii) Third-degree price discrimination.**

The A-Level syllabus focuses on third-degree price discrimination because third-degree price discrimination is the most common type.

Definition:

Third-degree price discrimination refers to efforts taken by a firm to:
- raise its price in the market where demand is price inelastic; and
- lower its price in the market where demand is price elastic.

This enables the firm to earn higher revenue and hence higher profits from both markets than charging a single price.

There are many real-world examples of third-degree price discrimination, such as:
a) Student vs adult prices for movie tickets;
b) Lunchtime promotional prices at restaurants;
c) Student/Elderly vs adult prices for public transport; or

Self-Assessment 10
What other real-world examples of third-degree price discrimination can you think of?

Under third-degree price discrimination, consumers are segmented into different groups with different price elasticity of demand.

Consumers in the group with a price <u>elastic</u> demand will be charged a <u>lower</u> price	Consumers in the group with a price <u>inelastic</u> demand will be charged a <u>higher</u> price.
The lower price charged in the group with the more price elastic demand will lead to a <u>more than proportionate increase</u> in quantity demanded, leading to an increase in total revenue received overall.	The higher price charged in the group with the more price inelastic demand will lead to a <u>less than proportionate fall</u> in quantity demanded, again leading to an increase in total revenue received overall.
For example, students' demand for movies in the cinema is price elastic as it takes up a large proportion of their income.	Using the same example of movie tickets, demand for movies by adults is price inelastic as it takes up a small proportion of their income.
Therefore, by charging students a lower price, cinemas will see a more than proportionate increase in the quantity demanded of movies among students, which increases their total revenue.	Therefore, by charging adults a higher price, cinemas will see a less than proportionate decrease in the quantity demanded of movies among adults, which increases their total revenue.

Self-Assessment 11

Refer to the definition of price discrimination. Why do you think that the following may not be <u>not</u> examples of third-degree price discrimination?

a) Business-class vs Economy-class airline ticket prices

b) Weekday vs weekend movie ticket prices

Price discrimination can also support Growth / Expansion strategy

Firms can also practice price discrimination across markets in different countries, allowing it to establish itself in new foreign market where competition may be stiff.
- In some cases, a firm may be a monopoly in one country (e.g. the domestic market) and can charge a high price due to the price inelastic demand it faces in this market, making supernormal profits.
- The profits earned could then be used to cover its losses in another country (e.g. the foreign market) where it has to charge a very low price due to higher competition from incumbent firms.
- This would allow the firm to force competitors in the foreign market out of business and hence establish its market share, assuming that it faces the similar costs of production in both markets.

The following table will help students analyse the positive and negative impact of the above strategy of PRICE DISCRIMINATION on the cost and revenue of firms before linking to profits.

Impact of Price Discrimination on firms' Cost & Revenue	Positive Impact on Profits (Intended Consequences)	Negative Impact on Profits (Unintended Consequences)
Cost	Price discrimination can help firms expand to other markets and increase their output to reap more iEOS → **reduce AC**.	Firms may **incur costs** to set up systems to facilitate price discrimination, e.g. systems to help airlines calculate and load different fares dynamically over time.
Revenue	Price discrimination allows firms to enjoy higher TR than they would have if they charged a uniform price. Price discrimination can help firms expand to other markets and **increase TR**.	-
Link back to Profits (= TR – TC)	Summary: • TC decreases and • TR increases, The firm's profits will therefore increase, i.e. supernormal profits.	Summary: • TC increases and The firm's profits will decrease, i.e. subnormal profits.

The following table will help students analyse the strengths and drawbacks of the PRICE DISCRIMINATION strategy for larger firms and smaller firms based on the FEAST framework

Analysis of Price Discrimination strategy using F.E.A.S.T.	Application of Price Discrimination to:	
	Larger firms in more concentrated/ less competitive industries (e.g. Oligopoly)	**Smaller firms in less concentrated/ more competitive industries (e.g. Monopolistic Competition)**
Feasibility	Largely feasible and can be very effective for firms if they have sufficient information about the different PED among different groups of consumers and have the ability to segment the sub-markets and prevent resale.	
Effectiveness		
Addressing Root Cause (targeting both AC & AR)	The impact of price discrimination is mainly on increasing AR. The impact on AC is secondary.	
Side Effects	-	
Time Lag	It might take a while for producers to gain sufficient information about the different PED amongst different groups of consumers	

9. Impact of Firms' Decisions & Strategies

In this section, we will learn how the decisions and strategies of firms may affect:
- Efficiency (one of the government's microeconomic goals);
- Consumers' welfare; and
- Other firms.

Firstly, we will learn about **market power** and how the strategies used to enhance such power can affect the level of welfare in society in terms of efficiency.

Definition:
Market power refers to the ability of firms to raise prices and profits above the perfectly competitive level.

Typically, the firm will gain at the expense of consumers.

The strategies that help the firm to increase market power are summarised below. Students should be able to explain and illustrate how the existence of market power and the strategies used to enhance such power can affect the level of welfare in society in terms of productive, allocative and dynamic efficiency.

Strategies	How the strategies increase demand and/or reduce PED → increasing market power → increase profit-maximising price
1. Growth	• Increase in market share → increase DD for firm's product • Fall in number of rival firms → increase DD & reduce PED of firm's product
2. Diversification	• Diversification allows for growth and expansion → Increase in market share → increase DD for the firm's product • Diversification increases the uniqueness of a firm's product offerings in terms of product range →reducing PED
3. Innovation	• Targets consumers' tastes & preferences → stimulates higher demand for firms' products • Increase uniqueness of firm's product → reduce PED
4. Marketing	• Targets consumers' tastes & preferences → stimulates higher demand for firms' products • Increase perceived uniqueness of firm's product → reduce PED
5. Collusion	• Reduces the level of competition in the market/allows cartels to act like a big monopoly → Increase in market share → increase DD for firm's product
6. Price Competition	• Reduces the level of market competition in the long term → Increase in market share in future → increase DD for firm's product in future
7. Price Discrimination	• Allows firms to set higher prices in the sub-market where PED<1

9.1 Efficiency

In this section, we will learn about the criteria that we will use to analyse the impact of firms' strategies on society based on *efficiency.*

Criteria to analyse the impact on society's welfare:		
Allocative Efficiency	Productive Efficiency	Dynamic Efficiency

(i) Allocative Efficiency

Definition:
Allocative efficiency can be defined as the output level where society's welfare is maximised.

At the firm level, this is achieved when **Price (P) = Marginal Cost (MC)** (assuming there are no externalities), where:
- P represents the value placed on the good by consumers and society; and
- MC represents the marginal cost of producing the good.

Price reflects the consumers' valuation of the marginal benefit of consuming the good. Conversely, the seller's marginal cost measures the cost of using resources to produce one more unit of the good. Therefore, allocative efficiency is achieved when the output level corresponds to **P=MC**, assuming no externalities.
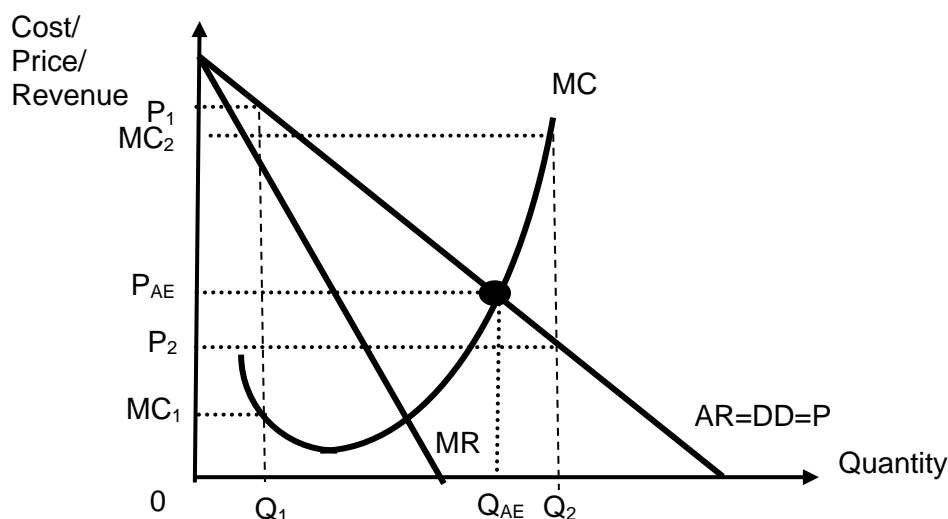

Figure 21: Allocative efficient output of a firm

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Explanation of why firms should charge P=MC to be allocative efficient (Figure 21):

At output Q_1 where **P > MC** (P_1>MC_1):	At output Q_2, where **P < MC** (P_2<MC_2):
• Consumers' valuation of an additional unit of the good produced (i.e. marginal benefit) is worth more than the additional costs to produce it • This implies that too few resources are used to produce this good. • The **under-allocation of resources** results in too few units of this good being produced, and hence consumers are willing to pay more for the good. • Consumers would be better off if more resources were diverted to the production of this good.	• The additional cost to produce the last unit of the good is higher than the consumers' valuation of that unit (i.e. marginal benefit) • This implies that too many units of this good were produced • The **over-allocation of resources** results in too many units of this good being produced. • Resources should be diverted to another industry to produce the alternative goods desired by the people.
Therefore, there is neither overproduction nor underproduction at output QAE where P = MC (PAE = MC). The quantity of output is **socially optimal**. Resources cannot be reallocated to increase consumers' satisfaction. There is, therefore, allocative efficiency. Note: In Figure 20, the profit-maximising price and output were not identified. To compare that with P_{AE} and Q_{AE}, please refer to Figure 21.	

Price-Setting Firms that Maximise Profits are Typically Allocative Inefficient

With reference to Figure 21, a firm that maximises profit would produce Q_e and charge P_e. However, we have learned that the allocative efficient output should be at Q_{AE} where P=MC. This means that price-setting firms typically under-produce their products (where Q_e < Q_{AE}) to maximise profits, and this causes allocative inefficiency for society. In such cases, society would incur a deadweight/ welfare loss.

For allocative inefficiency, we can illustrate the welfare loss to society using the concepts of producer and consumer surplus.
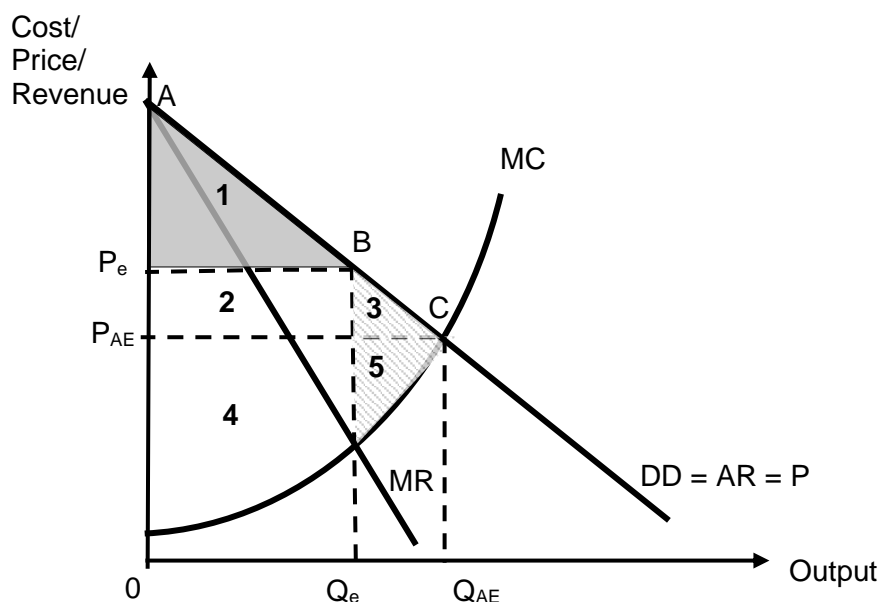
Figure 22: Market failure due to market dominance that causes under-production (i.e. $Q_e < Q_{AE}$)

With reference to **Figure 22**, when a firm produces at the allocative efficient output where P=MC, the equilibrium price and output occurs at P_{AE} and Q_{AE} respectively.

- **Consumer surplus (CS)** is shown by Areas 1+2+3;
- **Producer surplus (PS)** by Areas 4+5; and the
- **Total surplus (CS + PS)** is maximised at this output level Q_{AE}: Areas 1+2+3+4+5.

If the firm produces at the output where MC=MR to maximise profit, the equilibrium price and output of would be at P_e and $Q_{e,}$ respectively.

At output Q_e,
- **Producer surplus** is Areas 2+4 (note that Area 2 has been transformed from previous consumer surplus previously at QAE to producer surplus).
- **Consumer surplus** falls drastically to Area 1.
- **Total surplus (CS + PS)** at Q_e is Areas 1+2+4.
- Profit-maximisation by a price-setting firm has resulted in **a loss of surplus of Areas 3+5.**
- This is known as the **deadweight welfare loss** to society. It shows that society's welfare is not maximized, and allocative efficiency is not achieved in a monopolistic market.

	Firm that produces at allocative efficient output where P=MC (Q_{AE})	Firm that produces at profit-maximising output where MC=MR & MC is rising (Q_e)
Equilibrium P & Q Levels	P_{AE} and Q_{AE}	P_e and Q_e
Consumer Surplus	Areas 1 + 2 + 3	Area 1
Producer Surplus	Areas 4 + 5	Areas 2 + 4
Deadweight Loss	–	Areas 3 + 5 (used to be enjoyed at Q_{AE} but lost to society at Q_e)
Allocative Efficiency?	Allocative Efficient	Allocative Inefficient

IMPORTANT:

While all price-setting firms that maximise profits would be allocative inefficient, **the extent of the inefficiency (measured by the size of the deadweight loss) depends on the divergence between P and MC**.

- The greater the firm's market power and price level, the greater the divergence between P and MC, and ***the greater the deadweight loss and allocative inefficiency***.
  - o Larger firms in less competitive markets (e.g. oligopolistic firms) have greater market power than smaller firms in more competitive markets (e.g. monopolistic competitive firms) have less market power
- Firms may not always seek to maximise profits and may set prices lower than the profit-maximising price (e.g. when pursuing market dominance objective and engaging in price competition). The divergence between P and MC may not be so large (to be analysed in greater detail later).

The following table helps students analyse how each of the following firms' strategies would affect ALLOCATIVE EFFICIENCY

Strat-egies	Impact on Allocative Efficiency (i.e. impact on price set by firm → divergence between P and MC → size of deadweight loss → extent of allocative inefficiency)	Evaluation
1. Growth	Increase in market share → increase DD for firm's product Fall in number of rival firms/ increase in the uniqueness of firms' product → increase DD & reduce PED of firm's product	Depends on the level of market competition → if the market is competitive, firms may charge P lower than profit-maximising P to engage in P-competition → reduce divergence between P and MC.
2. Innovation	These increase market power → allow firm to set higher profit-maximising P → increase the divergence between P & MC → increase size of DWL → increase allocative inefficiency (*Apply this elaboration to the factors below*)	Process innovation may help to increase the productivity of firms → increase output per hour → reduce AC and MC → reduce the profit-maximising price → reduce divergence between P & MC → reduce allocative inefficiency
3. Diversi-ication	Diversification & Marketing allows for growth and expansion → Increase in market share → increase DD for the firm's product Diversification increases the uniqueness of a firm's product offerings in terms of product range →reducing PED	Diversification → reap greater internal economies of scope → reduce AC and MC → reduce profit-maximising price → reduce divergence between P & MC → reduce allocative inefficiency

Strat-egies	Impact on Allocative Efficiency (i.e. impact on price set by firm → divergence between P and MC → size of deadweight loss → extent of allocative inefficiency)	Evaluation
4. Marketing	Marketing could influence consumers' tastes and preferences and stimulate demand for its products →increasing the market share of the firm - Salience bias → increase market share, DD and lower PED Marketing helps to develop brand loyalty among customers→ Increase the sense of uniqueness of the product → reduce PED These increase market power of firms in the LR → increase allocative inefficiency.	Depends on the level of market competition → if the market is competitive, firms may charge P lower than profit-maximising P to engage in P-competition → reduce divergence between P and MC.
5. Collusion	Reduces the level of competition in the market/allows cartels to act like a big monopoly → Increase in market share → increase DD for firm's product These increase the market power of firms in the LR → increase allocative inefficiency.	The government may crack down on such anti-competition behaviour, especially the forming of cartels → force them to break up → reduce market power → reduce divergence between P and MC (see **Section 11**)
6. Price Competition	Reduces the level of market competition in the long term → Increase in market share in future → increase DD for firm's product in future These increase the market power of firms in the LR → increase allocative inefficiency.	In the short run, price competition → reduce divergence between P and MC → reduce allocative inefficiency
7. Price Discrimination	Allows firms to set higher prices in the sub-market where PED<1 These increase the market power of firms in the LR → increase allocative inefficiency. A firm may use price discrimination to drive competitors out of business (i.e. predatory pricing) - For example, in many towns, large bus companies have used the profits they make in other towns where they have a monopoly to subsidise their bus fares in new towns and thereby drive competitors out of business, only then to raise prices above those that the competitors had been charging → increase divergence between P & MC in the long run	There is less allocative inefficiency in the sub-market where the lower price is charged but greater allocative inefficiency in the sub-market where the higher price is charged.

(ii) Productive Efficiency

Definition:
Productive efficiency is achieved when a given level of output is produced at the lowest cost.
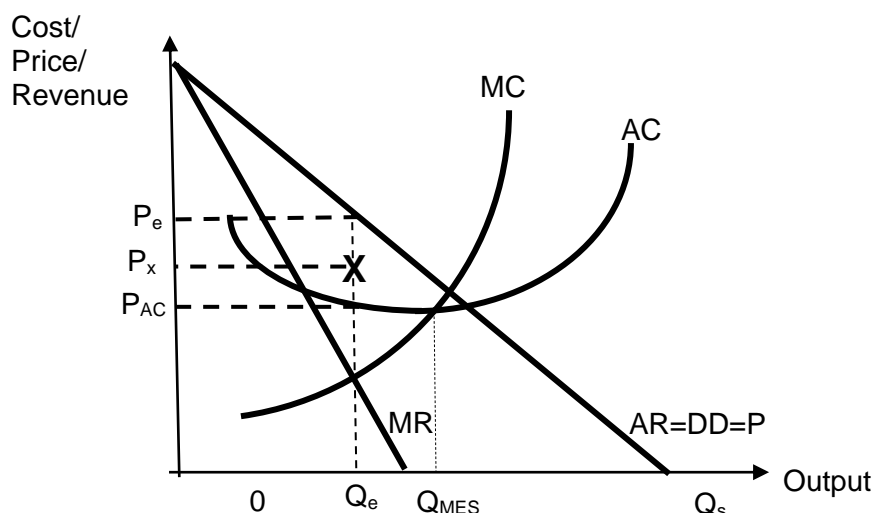
Figure 23: Productive Efficiency

At the firm level:	From the industry level:
Any point on the AC can be considered as being productive efficient. This is because any point on the AC represents the minimum cost for producing that particular level of output, i.e. the firm does not suffer from X-inefficiency. With reference to **Figure 23**, when the firm is producing the profit-maximising output of Qe, and its AC is at P_{AC}, it would be productive efficient from the firm's level. However, if it suffers from **X-inefficiency** due to wastefulness and a lack of cost controls, its AC may be Px, above the AC curve. In this case, it would not be productive efficient at the firm's level	Productive efficiency is only achieved at the minimum points of the AC, (i.e. Q_{MES}) i.e. the minimum efficient scale (see **Section 4.4**). This means the firms have exploited all internal economies of scale, and there has been no wastage of scarce resources (i.e. where MC cuts AC).

Definition:
X-inefficiency usually occurs when a firm acquires so much market power that it is no longer threatened by potential competitors or new entrants, resulting in complacency and reducing its incentive to keep costs to the lowest.

The following table helps students analyse how each of the following firms' strategies would affect PRODUCTIVE EFFICIENCY

trat-egies	Impact on Productive Efficiency	Evaluation
1. Growth	**Firm's Level** - Growth → <mark>increase market share</mark> –> could lead to market dominance and lack of market competition → breed sense of complacency in the dominant firm + lack of cost control → X-inefficiency	**Firm's Level** Depends on the level of market competition after growth → if the market is still competitive, firms would not be complacent and engage in cost controls → produce on the AC → productive efficient at firm's level **Industry level** Growth → as a firm increases output, it may produce closer to or at the MES → productive efficient at industry level
2. Innovation	**Firm's Level** Innovation, Diversification & Marketing allow for growth and expansion → Increase in market share → <mark>increase market power</mark> of firms in the LR → could lead to market dominance and lack of market competition → breed sense of complacency in the dominant firm + lack of cost control → X-inefficiency	**Firm's Level** Process innovation may help to better control cost → productive efficient at firm's level **Industry level** Innovation → allow firms to increase market share → as firm increases output, it may produce closer to or at the MES → productive efficient at industry level
3. Diversification		**Industry level** Diversification & Marketing → allow firms to increase market share → as firm increases output, it may producer closer to or at the MES → productive efficient at industry level **Firm's Level** Depends on level of market competition after growth → if market is still competitive, firms would not be complacent and engage in cost controls → produce on the AC → productive efficient at firm's level
4. Marketing		

trat-egies	Impact on Productive Efficiency	Evaluation
5. Collusion	**Firm's Level** Reduces the level of competition in the market/ allows cartels to act like a big monopoly → <mark>increase the market power</mark> of firms in the LR → could lead to market dominance and lack of market competition → breed sense of complacency in the dominant firm + lack of cost control → X-inefficiency **Industry Level** Smaller firms allocated a smaller output in cartels, and price-following firms in the price-leadership model may be producing further away from their MES and forgoing the potential iEOS that could be reaped.	**Firm's Level** The government may crack down on such anti-competition behaviour, especially the forming of cartels → force them to break up → reduce market power → less tendency to be X-inefficient (see **Section 11**) Smaller firms in cartels or price-followers in the price-leadership model are unlikely to maximise profits and would need to engage in cost-controls to increase profits.
6. Price Competition	**Firm's Level** Reduces the level of market competition in the long term → Increase in market share in future → <mark>increase the market power</mark> of firms in the LR → could lead to market dominance and lack of market competition → breed sense of complacency in the dominant firm + lack of cost control → X-inefficiency	**Firm's Level** In the short run, price competition → firm's profits are depressed → need to engage in cost controls to maintain further falls in profits → less likely to be X-inefficient **Industry Level** Firms engaging in price competition are likely to increase output to reduce P→ producing closer to or at the MES → PE at the industry level
7. Price Discrimination	**Firm's Level** Firms enjoying higher AR due to price discrimination would also be enjoying greater profits → may become complacent and neglect cost controls → tendency to be X-inefficient	**Firm's Level** It depends on the level of market competition after growth → if the market is still competitive, firms would not be complacent and engage in cost controls --> produce on the AC → PE at the firm's level

(iii) Dynamic Efficiency

> **Definition**:
> ***Dynamic efficiency*** is achieved when firms invest in technology so that productivity and product quality will improve over time.

Firms become technologically progressive through investing in research and development (R&D) for the purpose of:
- Product innovation (new products / better quality products); and
- Process innovation (new production methods that raise productivity levels.

Investment in R&D involves uncertainty, given that R&D involves dabbling into the unknown. Some R&D work may not produce innovation.

Dynamic efficiency is dependent on the:
- Incentive of firms to innovate (depends on the level of competition & contestability in the market); and
- Ability to innovate (depends on types of AR and profits of the firm).

The following table helps students analyse how each of the following firms' strategies would affect DYNAMIC EFFICIENCY

Strat- egies	Impact on Dynamic Efficiency	Evaluation
1. Growth	- Growth → increase market share –> ability to set higher P → increase AR → increase profits ceteris paribus → greater ***ability*** to innovate → greater dynamic efficiency	Growth → increase market share → could lead to market dominance and lack of market competition → reduce the ***incentive*** to innovate → lower dynamic efficiency
2. Innovation	Increases dynamic efficiency	In the long run, when the firm's greater market share leads to market dominance and lack of market competition →reduces the ***incentive*** to innovate → lower dynamic efficiency
3. Diversification	- To diversify to different markets, firms may need to engage in innovation → increase dynamic efficiency - Diversification → economics of scope → reduce AC → increase profits ceteris paribus → greater ***ability*** to innovate → greater dynamic efficiency	- Failure in attempts to diversify may add to the firm's AC and may not increase the firm's AR → fall in profits →reduced ***ability*** to innovate → lower dynamic efficiency

Strat-egies	Impact on Dynamic Efficiency	Evaluation
4. Marketing	Marketing → increase market share –> ability to set higher P → increase AR → increase profits ceteris paribus → greater *ability* to innovate → greater dynamic efficiency	Marketing may mean diverting resources away from R&D that develops tangible product differentiation to marketing efforts that develop perceived product differentiation → reduce innovation → reduce dynamic efficiency
5. Collusion	Firms that collude are less likely to engage in price competition because they are bound by cartel agreement/ tend to follow the P set by P-leader → more likely to engage in non-price competition → greater *incentive* to innovate → greater dynamic efficiency E.g. in a price-leadership model, smaller firms that follow the price leader may wish to use innovation to increase market share and potentially become the price leader.	In a cartel, firms are less likely to innovate because even if their products are more appealing to consumers, they are unable to increase output due to the cartel agreement (unless they resort to cheating) → lower dynamic efficiency Also, in a cartel, due to the lower levels of competition and assured high price that all firms can charge → less *incentive* to innovate to compete given the profits each firm can already enjoy → lower dynamic efficiency
6. Price Competition	Reduces the level of market competition in the long term → Increase in market share in future → increase the market power of firms in the LR → ability to set higher P → increase AR → increase profits ceteris paribus → greater *ability* to innovate → greater dynamic efficiency in future	In the short run, P-competition → reduces AR → reduces profits ceteris paribus →reduce the *ability* to innovate → lower dynamic efficiency In the long run, → Increase in market share in future → increase the market power of firms in the LR → reduce the *incentive* to innovate → lower dynamic efficiency
7. Price Discrimination	Firms enjoying higher AR due to price discrimination would also be enjoying greater profits → greater *ability* to innovate → greater dynamic efficiency	It depends on the level of market competition after growth → if the market is still competitive, the firm would still have the *incentive* to innovate → increase dynamic efficiency

9.2 Consumers' Welfare

In this section, we will learn about how the decisions of a firm may affect consumers' welfare. We will use the following criteria to analyse the impact on consumers' welfare:

Criteria	Impact on Consumers' Welfare
Consumer Surplus	Firms' decisions that result in lower prices and higher output will result in greater consumer surplus and benefit consumers.
Product Variety	Firms' decisions that provide greater product variety will benefit consumers (consumer choice).
Product Quality	Firms' decisions that improve product quality will benefit consumers.

Strategy	Impact on Consumer Surplus
1. Growth	✓ Growth → while the profit-maximising price of the firm would increase, its output would also increase and cause **consumer surplus** to increase.
2. Shutdown	✗ Shutting down of firms → fall in the number of firms in the market → fall in market supply → rise in market price and fall in market output → fall in **consumer surplus**
3. Innovation	- Process innovation that helps to reduce AC and MC for firms →allows firm to reduce the profit-maximising price while increasing output → increase **consumer surplus** ✗ If innovation allows the firm to outcompete rival firms to establish market dominance in the long-term, it may lose the incentive to innovate→ start to become complacent and X-inefficient → increase AC & MC→ reduce output and increase the price → reduce **consumer surplus**
4. Diversification	- Diversification → economies of scope→ reduce AC and MC for firms → allow the firm to reduce the profit-maximising price while increasing output → increase **consumer surplus** ✗ If diversification allows the firm to outcompete rival firms to establish market dominance in the long-term → start to become complacent and X-inefficient → increase AC & MC→ reduce output and increase the price → reduce **consumer surplus**
5. Marketing	- Marketing → increases DD and reduces PED of firm's pdt → while the profit-maximising price of the firm would increase, its output would also increase and cause **consumer surplus** to increase. ✗ If marketing allows the firm to outcompete rival firms to establish market dominance in the long-term → start to become complacent and X-inefficient → increase AC & MC→ reduce output and increase the price → reduce **consumer surplus**

6. Collusion	✗ Collusion lowers the level of competition within the market →allows firms to collectively restrict output to set higher prices →reduces *consumer surplus* ✗ Collusion may breed X-inefficiency among firms due to complacency and lack of competition → increase AC & MC→ reduce output and increase the price → reduce *consumer surplus*
7. Price Competition	- Price competition → firm increases output to reduce the price → increases *consumer surplus* in the short-term ✗ If price competition allows the firm to eliminate/ keep out rival firms to establish market dominance in the long-term → start to become complacent and X-inefficient → increase AC & MC→ reduce output and increase the price → reduce *consumer surplus*
8. Price Discrimination	✗ Those paying the higher price will probably feel that price discrimination is unfair to them. Price has risen for them, and their *consumer surplus* is lower. E.g. adults paying higher bus fares - On the other hand, those who previously purchased the good but are now paying a lower price will feel better off. Their *consumer surplus* will be higher. E.g. students paying lower bus fares - Firms may use price discrimination to drive competitors out of business[7] → establish market dominance in the long-term → start to become complacent and X-inefficient → increase AC & MC→ reduce output and increase the price → reduce *consumer surplus*

Strategy	Impact on Product Variety & Product Quality
1. Growth	✗ Growth→ expansion of firm may allow it to establish market dominance and reduce the level of competition in the market → fewer number of rival firms → reduce *product variety* for consumers & firm may lack the incentive to improve *product quality* to maintain competitiveness - Growth →reap iEOS → reduce AC →increase profits →increase the ability to improve *product quality*/ innovate to increase *product variety*
2. Shutdown	✗ Shutting down of firms → fall in the number of firms in the market → reduce *product variety* for consumers ✗ Shutting down of firms → reduce the level of competition in the market → fewer number of rival firms → surviving firms may lack the incentive to improve *product quality* to maintain competitiveness

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[7] For example, in many towns, large bus companies have used profits they make in other towns where they have a monopoly to subsidise their bus fares in new towns and thereby drive competitors out of business, only then to raise prices above those that the competitors had been charging.

3. Innovation	- Innovation allows firms to increase ***product variety*** and improve ***product quality*** ✗ If innovation allows the firm to outcompete rival firms to establish market dominance in the long-term, it may lose the incentive to innovate in future → reduce ***product variety & quality*** in future
4. Diversification	- Diversification → increase ***product variety*** for consumers - Diversification → economies of scope→ reduce AC and MC for firms → increase profits →increase ability to improve ***product quality***/ innovate to increase ***product variety*** ✗ If diversification allows the firm to outcompete rival firms to establish market dominance in the long-term → start to become complacent and X-inefficient → increase AC & MC→ decrease profits →decrease the ability to improve ***product quality***/ innovate to increase ***product variety***
5. Marketing	Marketing or advertising does not have a tangible impact on product variety or quality. ✗ If marketing allows the firm to outcompete rival firms to establish market dominance in the long-term, it may lose the incentive to innovate→ start to become complacent and X-inefficient → increase AC & MC→ decrease profits →decrease the ability to improve ***product quality***/ innovate to increase ***product variety***
6. Collusion	✗ Collusion lowers the level of competition within the market → lack of incentive to improve product quality or variety to compete - E.g. in a cartel, firms' output is fixed based on cartel agreement, and hence there is little incentive to enhance the quality of product/ variety to increase output sold ✗ Collusion may breed X-inefficiency among firms due to complacency and lack of competition → increase AC & MC→ decrease profits →decrease the ability to improve ***product quality***/ innovate to increase ***product variety***
7. Price Competition	- Price competition → reduces firm's AR →reduces profits ceteris paribus →decreases the ability to improve ***product quality***/ innovate to increase ***product variety*** ✗ If price competition allows the firm to eliminate/ keep out rival firms to establish market dominance in the long-term, it may lose the incentive to innovate→ start to become complacent and X-inefficient → increase AC & MC→ decrease profits →decrease the ability to improve ***product quality***/ innovate to increase ***product variety***
8. Price Discrimination	- Price-discrimination allows the firm to enjoy higher AR → increase profits ceteris paribus → increase ability to improve ***product quality***/ innovate to increase ***product variety***

9.3 Other firms

In this section, we will learn about how the decisions of a firm may affect other firms. We will use the following criteria to analyse the impact on the **profits** of other firms:
- Average revenue/ total revenue; and
- Average cost/ total cost.

Strat-egies	Impact on Other Firms in terms of:	
	Revenue	**Cost**
1. Growth	✗ Growth of a firm may reduce the market share of other firms → reduce DD=P=AR of other firms	✗ Growth of a firm may reduce the market share of other firms → reduce their ability to reap internal economies of scale → rise in AC of other firms
2. Shutdown	✓ The shutdown of a firm → allows other firms to enjoy a higher market share → increase DD=P=AR of other firms	✓ The shutdown of a firm → allows other firms to enjoy a higher market share → increase output → increase iEOS → reduce AC of other firms
3. Innovation	✗ Product innovation of a firm allows the firm to establish market dominance→ attract consumer demand from other firms → reduce DD=P=AR of other firms	✗ Product innovation of a firm→ attract consumer demand from other firms Product innovation of a firm→ attract consumer demand from other firms + other firms may face greater pressure to increase spending on innovation that causes an increase in AC of other firms
4. Diversification	✗ Diversification by a firm allows the firm to outcompete rival firms to establish market dominance in the long-term → reduce the market share of other firms → reduce DD=P=AR of other firms	✗ Diversification & Marketing by a firm allows the firm to outcompete rival firms to establish market dominance in the long-term → reduce the market share of other firms →reduce output → reduce iEOS → increase AC of other firms
5. Marketing	✗ Marketing by a firm allows the firm to establish market dominance → attract consumer demand from other firms → reduce DD=P=AR of other firms	✗ Other firms may feel the pressure to match the firm in terms of diversification & marketing → increase AC of other firms

Strat-egies	Impact on Other Firms in terms of:	
	Revenue	**Cost**
6. Collusion	✓ Firms that collude with each other can collectively enjoy the benefits of market dominance → can collectively set high prices → enjoy high AR ✗ Firms that are not part of the collusion would lose market share → reduce DD=P=AR of other firms	✓ Firms that collude with each other can save on costs to compete with each other, e.g. marketing → reduce AC of other firms ✗ Firms that are not part of the collusion may need to spend more on strategies to reinforce their market share, e.g. marketing → increase AC of other firms
7. Price Competition	✗ Price competition by a firm can spark price wars among firms → all firms have to reduce P and experience a fall in AR	✗ Predatory pricing by a firm can drive rival firms out of the market or cause the market share of rival firms to fall →reduce output → reduce iEOS → increase AC of other firms
8. Price Discrimination	✗ Firms may use price discrimination to drive competitors out of business[8] → establish market dominance in the long-term → fall in market share of competitors →reduce DD=P=AR of other firms	✗ Firms may use price discrimination to drive competitors out of business→ establish market dominance in the long-term → fall in market share of competitors →reduce output → reduce iEOS → increase AC of other firms

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[8] For example, in many towns, large bus companies have used profits they make in other towns where they have a monopoly to subsidise their bus fares in new towns and thereby drive competitors out of business, only then to raise prices above those that the competitors had been charging.

9.4 Managing Technological Disruptions

In the 1940s, Austrian economist Joseph Schumpeter coined the term 'creative destruction to describe how technological progress improves many lives, but only at the expense of a smaller few. He referred to the industrial revolution that introduced mechanised looms and factories that put traditional weavers and craftsmen out of jobs.

Fast forward to the world we live in today, we continue to see how major technological disruptions are displacing how firms operate and creating winners and losers among firms.

We list some industries that have been/ are being or may be disrupted:

No	Industries	Winners	Losers
1.	Travel Agencies	Travel websites, e.g. Expedia, Kayak and Travelocity, allow consumers to easily compare prices and directly purchase air tickets, book hotels, and rent cars.	Travel agents with 'brick-and-mortar' stores. E.g. Dynasty Travel (est. 1978) was recently acquired by Travel Curators, a Singaporean travel technology company.
2.	Print Media	Online media, blogs, and digital media have grown in their scope and viewership. Companies are turning to advertise on social media platforms, e.g. Facebook and Google.	Traditional newspapers and magazines have seen their circulation numbers decline steadily and advertising revenue drying up. E.g. SPH Media has gone through 3 retrenchment exercises in 4 yrs and merged some publications (e.g. My Paper & The New Paper, and Lianhe Wanbao & Shin Min Daily) while ending other titles (e.g. Cleo, Shape & Young Parents).
3.	Booksellers	An increasing number of readers are turning to e-books on the Amazon Kindle Store and audiobooks on Audible.	Revenue of traditional bookstores steadily declined with falling demand while paying high rental costs. Borders and MPH are examples of bookstores that have closed in Singapore.
4.	Music	Consumers are now turning to digital music, e.g. Spotify and Apple Music.	The demise of CD shops, e.g. HMV and Tower Records.
5.	Taxi Services	There are 5 times more private-hire cars than taxis in Singapore today, and most trips today are ride-hail trips rather than street-hail trips. Grab has the dominant market share today.	The population of taxis owned by Comfort DelGro, SMRT and Trans-Cab have fallen by 44% in recent years.

6.	Delivery Services	Drone technology may revolutionize the way products are delivered, and Amazon is trying to make that a reality.	Dominant players, e.g. NinjaVan, may be disrupted if the drone technology becomes widespread.
7.	Manufacturing	3D printing is growing rapidly, and the technology is becoming better and faster for mass production that can customise products and quickly respond to shifts in market demand. E.g. 3D printed components are being built into Boeing's 787 Dreamliner.	Manufacturers that are slow to use 3D Printing technology may be displaced.
8.	Television and Radio Networks	Digital media and online streaming, e.g. Netflix, Spotify, and Disney+ have displaced traditional media.	Traditional TV networks, like MediaCorp, have struggled to maintain viewership and attract advertisers.

Source: Investopedia

Explaining why some firms succeed in addressing technological disruptions based on cost & revenue

In general, firms that are slow to respond to technological changes are negatively affected because of:
- Falling consumer demand → fall in market share → fall in DD=P=AR → TR falls
- Higher prices due to higher MC and AC than rival firms that can use technology to reduce MC and AC (and therefore charge lower prices) → lose customers to cheaper and more high-tech rivals.

These have caused their profits to fall and led to many shutdowns.

Firms which are able to ride on and exploit such technological changes will expand and may eventually dominate the market because they use technology and innovation to:
- Stimulate consumers' demand → increasing AR;
- Reduce MC and hence profit-maximising price to out-compete rival firms by charging lower prices; and
- Reducing AC to increase profits.

10.   Market Dominance as a Source of Market Failure

In Theme 2.3.2, we learned about Market Failure and its causes, e.g. externalities and imperfect information. In this section, we will learn about the last cause of market failure, which is Market Dominance.

In markets that have **high barriers to entry and low contestability**, i.e. Monopoly and Oligopoly, firms can dominate the market and cause markets to fail.

In Section 9, we have learned about how dominant firms using strategies to increase their market power could lead to different aspects of inefficiencies. A quick (and non-exhaustive) recap is provided here:

	Why market dominance leads to inefficiency *[Refer to diagrammatic analysis in Section 9.1]*	**Evaluation** **(why market dominance may not lead to inefficiency)**
Allocative Inefficiency	Due to high barriers to entry, the level of market competition is very low. Dominant firms have significant market power due to: - Their dominant market share; hence the firm enjoys **very high demand**; and - There are few rival firms; hence the **PED of the firm's product is very low**. Therefore, the dominant can set a very high price when maximising profit, which leads to a significant divergence between price and marginal price. The resultant deadweight loss is indicative of the significant allocative inefficiency.	- If the dominant firm is owned by the government, e.g. nationalised monopolies, it would likely produce at the output where P=MC and AE is achieved - Despite the high BTE, if the dominant senses that the market is still contestable and other firms could potentially enter, it may engage in *limit pricing* to keep them out. This price may be close to or equal to MC, which achieves AE.
Productive Inefficiency	**Firm Level** X-inefficiency usually occurs when a firm acquires so much market power in markets with high barriers to entry that it is no longer threatened by potential competitors or new entrants. This results in complacency, reducing its incentive to keep costs to the lowest. As such, dominant firms tend to be productive inefficient at the *firm level*. **Industry Level** With significant market power, dominants are likely to restrict output to charge a high profit-maximising price. Therefore, it is unlikely to produce at the minimum efficient scale (MES). This leads to productive inefficiency at the *industry level*.	**Firm Level** Despite the high BTE, if the dominant senses that the market is still contestable and other firms could potentially enter, it may not be complacent and still engage in cost controls → PE at the firm level **Industry Level** If the AC of the firm is low enough, the firm could produce at the lowest point of the AC *by coincidence* → PE at the industry level

Dynamic Inefficiency	Due to high barriers to entry, the level of market competition is very low, and hence dominant firms may lack the incentive to innovate to maintain competitiveness. This leads to dynamic inefficiency.	Despite the high BTE, if the dominant senses that the market is still contestable and other firms could potentially enter, the firm may still innovate to improve product variety and quality to remain competitive and prevent potential entrants.

[Note: Students also need to be able to explain how specific firms' strategies affect efficiency in Section 9.1]

Government Intervention to address Market Dominance

Typically, dominant firms would enjoy an immense amount of market power and may not work in society's interest if left to their own devices. Hence, it is vital for the government to regulate dominant firms, especially in the case of natural monopolies, such as public utilities, e.g. water services and electricity.

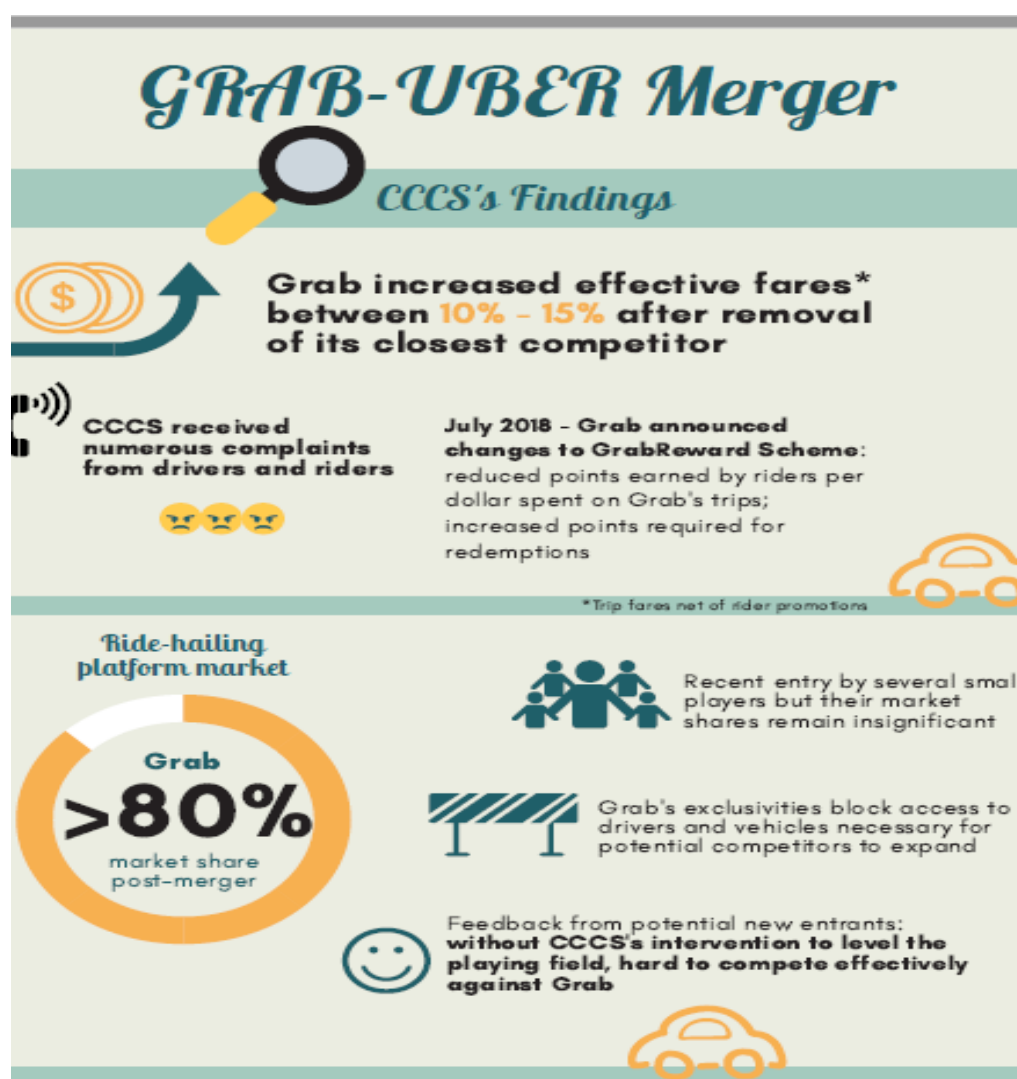The government can address market dominance in **3 ways:**

1. **Anti-Trust (Anti-Monopoly) Laws**
2. **Takeover / Nationalisation**
3. **Government Regulatory Pricing**

(1) Anti-Trust (Anti-Monopoly) Laws

Anti-trust or anti-monopoly laws promote or maintain market competition by regulating anti-competitive conduct by companies. They were introduced to curb collusive behaviour and the growing concentration of economic power. In addition, it seeks to protect the interests of consumers (consumer welfare) and ensure that firms have an opportunity to compete in the market economy are essential objectives.

These laws set limits on firms' behaviour by:	Examples
Prohibiting certain anti-competitive or restrictive practices tends to lead to a firm acquiring a dominant position in a market. - Such practices include ***price-fixing*** and ***predatory pricing,*** where the firm deliberately sets its price below the cost of production. It does this to destroy competition as current rival firms are forced out of business or a potential new firm is dissuaded from entering the market, thus maintaining or strengthening the monopolist's position.	In 2007, UK and US regulators fined British Airways and Korean Airlines $850m for operating a cartel to fix passenger and cargo fares. Virgin Atlantic & Lufthansa were also involved but received leniency for exposing the conspiracy. The Competition & Consumer Commission of Singapore (CCCS) found Grab's acquisition of Uber's Southeast Asia business to be anti-competition & imposed a S$6.85 million fine (*see infographic below*).
Supervising the mergers and acquisitions of large corporations,	In 2022, EU regulators blocked the merger of South Korean ship-

including joint ventures. - Transactions that are considered to threaten the competitive process can be prohibited altogether or approved subject to conditions such as an obligation to divest part of the merged business or to offer licenses or access to facilities to enable other businesses to continue competing.	making giants Daewoo & Hyundai over concerns that they may restrict the supply of cargo vessels to prop up prices. This followed similar measures to block the merger of India's Tata Steel with Germany's ThyssenKrupp.
Breaking up a monopoly firm into smaller independent units if it has become too powerful.	Since 2021, China's crackdown on firms with market dominance have led to a rush by such firms to divest (i.e. get rid of) their subsidiaries and reduce their market dominance. E.g. Tencent divested its stake in JD.com.

GRAB-UBER Merger

CCCS's Findings

Grab increased effective fares* between 10% – 15% after removal of its closest competitor

CCCS received numerous complaints from drivers and riders

July 2018 – Grab announced changes to GrabReward Scheme: reduced points earned by riders per dollar spent on Grab's trips; increased points required for redemptions

*Trip fares net of rider promotions

Ride-hailing platform market

Grab >80% market share post-merger

Recent entry by several small players but their market shares remain insignificant

Grab's exclusivities block access to drivers and vehicles necessary for potential competitors to expand

Feedback from potential new entrants: without CCCS's intervention to level the playing field, hard to compete effectively against Grab

Strengths of Anti-trust Laws	Limitations of Anti-trust laws
[**Effectiveness**] If the penalties are harsh, such measures should be able to secure compliance from firms [**Feasibility**] Less expensive to implement than nationalisation. Not feasible to use anti-trust laws against natural monopolies as it is difficult to inject competition into the market. [**Time**] Can be quicker to implement than other policies, e.g. nationalisation that takes time and require parliamentary approval.	[**Feasibility**] The problem with using legislation or some form of government regulation is that enforcement of such laws or regulations may be difficult and expensive. Constant monitoring is needed, which can translate into high costs for the government. [**Effectiveness**] In addition, for the law to be effective, the penalties for breaking the law must be sufficiently harsh. In the case of anti-trust laws, it may be very difficult to prove that firms actually collude or engage in anti-competitive actions. [**Side effects**] These laws may also prevent the benefits of mergers from being enjoyed, where cost savings due to internal economies of scale could lead to prices for consumers.

(2) Takeover / Nationalisation

The government may nationalise the industry, i.e. take over the monopoly completely and run it in the public interest. Instead of maximising profits, the government operating the monopoly will produce at the socially optimal output and charge the socially optimal price.

These state-owned monopolies (most of which are ***natural monopolies*** – examples are in **Section 7.2.2**) may practise AC pricing or MC pricing (explained below).

Strengths of Nationalisation	Limitations of Nationalisation
[**Feasibility**] Only if the government owns and operates the firm would the government indeed be aware of the actual marginal cost and be able to charge a price equal to marginal cost to promote allocative efficiency. [**Effectiveness**] In the case of natural monopolies, it is not possible to introduce competition and hence the only way to ensure social welfare is for the government to nationalise it.	[**Feasibility**] It can be costly to implement, especially since public servants may not have the expertise to run firms and require significant tax revenue to cover their losses. This is why, since the 1980s, governments all around the world have been privatising their nationalised firms (e.g. POSB and Singtel in Singapore). [**Side effects**] Nationalised firms that do not seek

	to make a profit make become complacent, neglect cost controls and become x-inefficient → no productive efficiency.
[**Side effects**] Specific key industries under public ownership may result in higher investment than if they were under private ownership. E.g. many governments invested heavily in the state-owned railway system. This resulted in fast, efficient transport services, with generally obvious benefits to commuters and the economy. A good case for discussion is the proposal by some economists to nationalise the MRT train services in Singapore. The under-investment in the maintenance of the rail system under private ownership has resulted in the frequent breakdown of the services in recent years.	

(3) Government Regulatory Pricing

The government may allow monopolies to continue, e.g. in a natural monopoly situation, but pass legislation to ensure they do not act 'against the public interest'. Usually, they are required to practise certain pricing policies.

There are two pricing policies that will be covered here:
   a) Marginal Cost (MC) Pricing; and
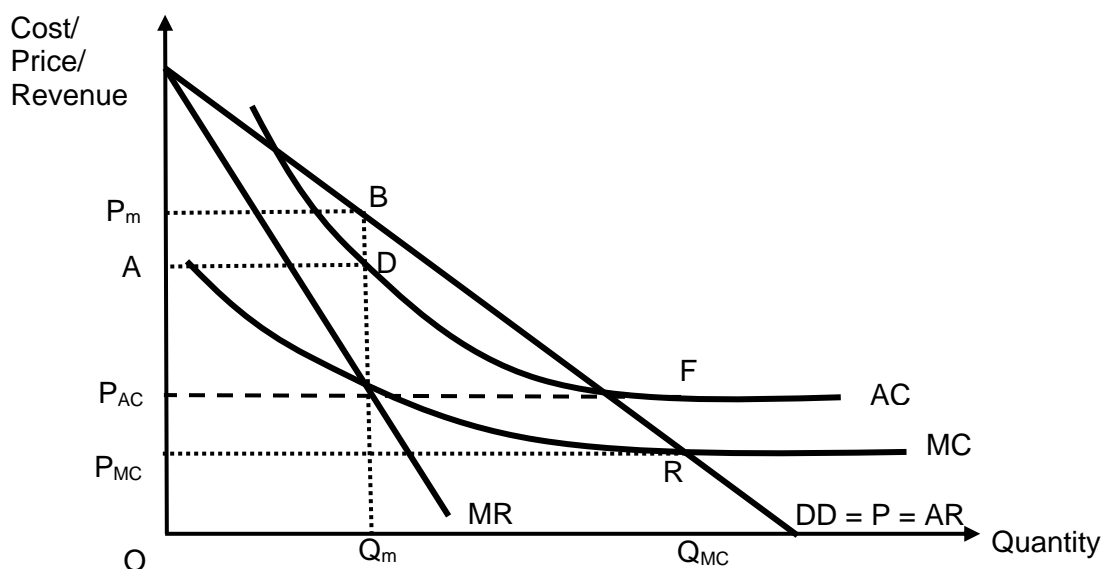   b) Average Cost (AC) Pricing.

Figure 24: Regulatory pricing imposed on a natural monopoly

a) Marginal Cost (MC) Pricing

Marginal cost pricing is one way to regulate a natural monopoly. In a natural monopoly, due to their high fixed costs, economies of scale are

so large that the AC and MC curves are *falling throughout all quantities demanded*, as shown in **Figure 24**.
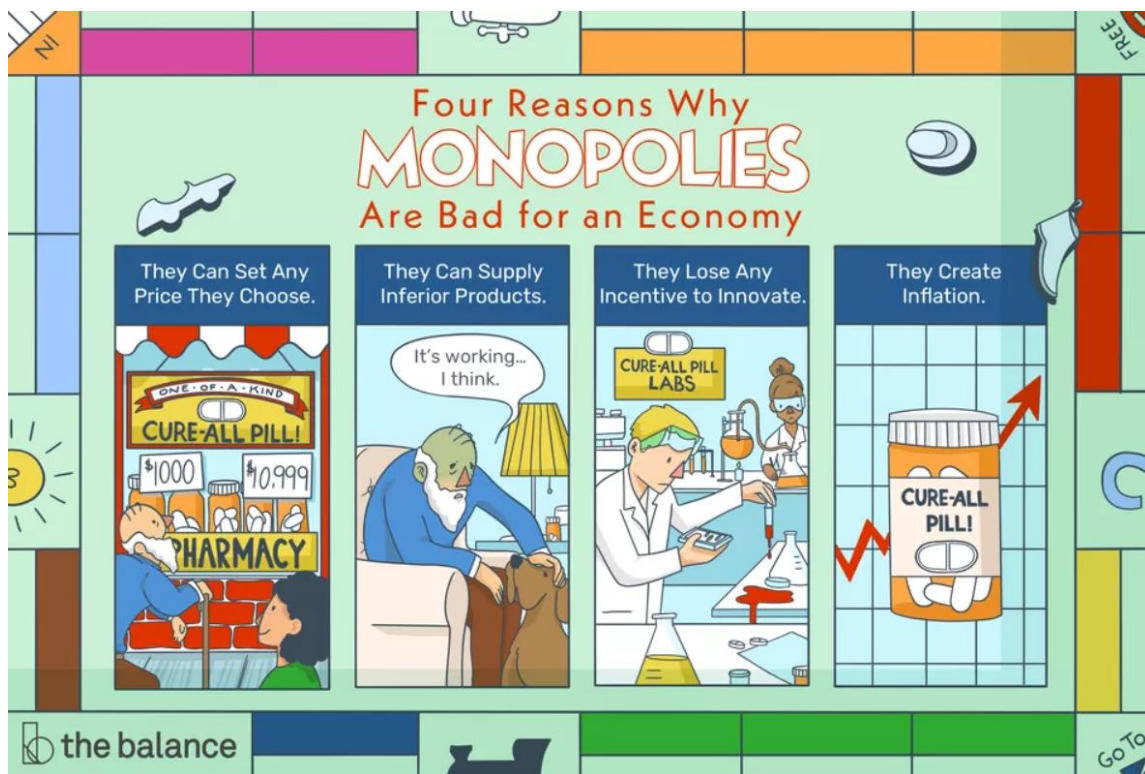
b) Average Cost (AC) Pricing

If the state does not wish to subsidise the firm, it may also impose AC pricing. The effect is shown in **Figure 24**. Under AC-pricing, the firm will produce at Q_{AC} and charge P_{AC} where it makes normal profit.

Natural Monopoly	Unregulated (Output Q_m where MC = MR)	Regulated: MC-Pricing (Output Q_{MC} where P = LRMC)	Regulated: AC-Pricing (Output Q_{AC} where P = LRAC)
Price	P_m	P_{MC}	P_{AC}
Output	Q_m	Q_{MC}	Q_{AC}
Level of Profit	P_mBDA (supernormal)	$P_{MC}P_{AC}$ FR (subnormal)	0 (normal)

Government Regulation	Strengths	Limitations
MC Pricing	[**Effectiveness**] Allocative efficiency will be achieved to the fullest extent since price is equal to MC. The firm is producing the quantity desired by the consumers. [**Effectiveness**] Price is lower and output much greater than the unregulated monopolist, promoting equitable access to the good regardless of household incomes.	[**Feasibility**] The government may not have perfect information on the MC of the firm unless it nationalises the firm. [**Feasibility**] The firm incurs a loss (subnormal profit) given by the area of the rectangle $P_{MC}P_{AC}$FR. This means the firm will not be viable in the LR unless the government subsidises the firm. May drain resources of the government at the expense of taxpayers.
AC Pricing	[**Effectiveness**] Price is lower and output much greater than the unregulated monopolist ($P_{AC}<P_m$), promoting equitable access to the good regardless of household incomes. The reduction in the monopoly's profits also promotes greater equity between the firm and consumers. [**Effectiveness**] Improved resource allocation as society gets a larger quantity of goods ($Q_{AC}>Q_m$) and less deadweight loss, i.e. lower	[**Effectiveness**] There will still be deadweight loss as resources are still inefficiently allocated. At Q_{AC}, the price is still greater than MC (i.e. $P_{AC}> MC$). The output under average cost pricing, Q_{AC}, is lower than that under marginal cost pricing, Q_{MC}, therefore, the good is under-produced, and there is still allocative inefficiency.

	allocative inefficiency than the situation before government intervention. [**Feasibility**] The firm makes a normal profit and can therefore continue production in the LR without the need for government subsidy. Feasible even for governments with poor fiscal health.	

Four Reasons Why MONOPOLIES Are Bad for an Economy

They Can Set Any Price They Choose.

They Can Supply Inferior Products.

They Lose Any Incentive to Innovate.

They Create Inflation.

Conclusion

In this topic, we have learnt key concepts of objectives of firms as well as cost and revenue. We also learned about barriers to entry and how it is a key factor among others that determine the market structures within which firms operate.

We then analyse how firms may choose to use strategies to increase their profits and how these strategies affect:
- Societal welfare in terms of efficiency;
- Consumers; and
- Other Firms.

Applying the Decision-Making Framework to Firms

Figure 22: Decision-Making Framework

From Theme 2.2, students should understand that to maximise profits, producers need to make many decisions, such as:
• Which consumers to target;
• How to price their product;
• Which combinations of production factors to employ; and
• What types of non-price strategies to use.

The decisions vary from firm to firm as the demand and costs conditions, as well as the extent of competition differs between firms and markets. Thus, knowing the key characteristics of a market and the likely behaviours of firms in such markets will help students better understand and appreciate such decisions.

Firms and Decisions (H2 Economics/ 9570)

An example of how the decision-making process (i.e. DMF Factors – C4IP) can be applied to a firm is described below:

Suppose a firm is deciding whether to advertise its product.

DMF Factors	Application to Firm's Decision/ Strategy
Benefit	- If successful, such advertising should raise the demand for its product and make it more price inelastic. The firm should then be able to charge higher prices and sell more output, so it **benefits** by earning more revenue.
Cost	- However, the firm also needs to incur **costs** as it needs to engage an advertising firm to conceptualise and run the advertising campaign.
Constraints	- It must also consider its **constraints** (e.g., amount of cash reserves or access to credit to finance the advertising campaign) and whether these constraints can be overcome and how long it will take to do so.
Information	- To estimate these benefits, costs and constraints, the firm needs to gather **information**. o It may need to ascertain how successful past campaigns have been, which advertising company is more competent, how much they charge, and whether banks are willing to lend to them and at what interest rates.
Perspectives	- It should also seek the **perspectives** of other economic agents such as its customers, other firms and industry experts on the important considerations for such a campaign to be successful.
Consequences	- Should the firm decide to advertise its product, it will then need to factor in whether the **intended consequences** have materialised (e.g., whether its revenue has risen more than its costs resulting in higher profits) and whether there were any **unintended consequences (**e.g., there could have been an unexpected backlash from the public regarding the campaign).
Changes	- Finally, it also needs to account for internal **changes** to its environment (e.g., its head of marketing leaving) and external **changes** (e.g., its competitor may have launched a new product) before deciding whether to continue, amend or abandon its existing advertising campaign. All these decisions will also naturally require the firm to gather information and seek the perspectives of other relevant economic agents.

Glossary of Key Terms

Allocative efficiency	The output level where society's welfare is maximised. At the firm level, this is achieved when **Price (P) = Marginal Cost (MC)**.
Backward integration	Occurs when a firm merges with another firm at the ***previous stage of production*** (moving up the supply chain).
Barriers to entry	**Barriers to entry** are conditions that impede the entry of new firms into an industry.
Collusion	**Collusion** refers to the situation where firms in a market cooperate to jointly fix prices or output.
Contestability	***Contestability*** refers to the ability of new rival firms to enter an industry to compete with existing firms.
Costs	Defined as expenses (e.g. labour and raw material costs) incurred by a firm in the production of goods and services.
Diseconomies of scale	<u>**Cost dis-savings**</u> that a firm faces when it increases its scale of production or when the whole industry expands, leading to an increase in the <u>cost per unit of production</u>. It may be generated internally or externally.
Duopoly	A **duopoly** is a particular case of an oligopoly where there are only 2 firms in the market.
Dynamic efficiency	**Dynamic efficiency** is achieved when firms invest in technology so that productivity and product quality will improve over time.
Economies of Scale (EOS)	**Economies of scale** are <u>**cost savings**</u> that a firm enjoys when it *increases its scale of production* or *when the whole industry expands*, leading to a decrease in the <u>cost per unit of production</u> (or average cost). It may be generated internally or externally.
Explicit costs	**Explicit costs** refer to actual "out-of-pocket" expenditure incurred by a firm to buy or hire factors of production. They involve money payment or financial outlay made by the firm. E.g. raw material costs and wages.
External diseconomies of scale	**External diseconomies of scale** are cost dis-savings that a firm face when the industry expands, leading to an increase in the <u>cost per unit of production</u>.
External economies of scale	**External economies of scale** are cost savings that a firm enjoys when the industry expands, leading to a decrease in the <u>cost per unit of production</u>.
Firm	A decision-making unit by the entrepreneur who combines and organises the factors of production – land, labour, capital to produce a good or service.
Fixed Factors	Factors of production that <u>**cannot**</u> be increased within a given time period.

Forward integration	Involves the firm merging with another firm at the **succeeding stage of production** (moving closer to the retail outlet or consumers).
Imperfectly competitive markets	**Imperfectly competitive markets** refer to markets with restrictions to free competition (Monopolistic Competition, Oligopoly & Monopoly).
Implicit costs	**Implicit costs** do not involve any direct payment of money to a third party but involve a sacrifice by the firm. It is incurred on factors of production owned by the firm. Although the firm does not have to pay to use the factors of production it owns, costs are still incurred as these factors could earn income for the firm from some alternative uses. Economists consider such costs as the **opportunity costs**.
Industry	Made up of firms producing similar goods and services.
Internal diseconomies of scale	**Internal diseconomies of scale** are cost dis-savings that a firm faces when it increases its scale of production, leading to an increase in the cost per unit of production.
Internal economies of Scale	**Internal Economies of Scale (iEOS)** are cost savings that a firm enjoys when it increases its scale of production, leading to a decrease in the cost per unit of production.
Limit pricing	**Limit pricing** is designed to deter the entry of new firms to protect an incumbent firm's monopoly power and supernormal profits. The limit price is **set below the profit-maximising price** (**price is lower than the estimated AC of a potential entrant**).
Long run	Long run is a time period where **all** the factors of production are **variable**.
Loss aversion	**Loss aversion** refers to the tendency for people to prefer avoiding a loss over making an equivalent or greater gain.
Marginal Cost	Refers to the additional cost of producing one more unit of output. The sum of the marginal costs gives the total variable cost.
Marginal Revenue	**Marginal Revenue** is the _additional_ revenue gained by selling _one more_ unit of output per period of time.
Market concentration ratio	The **market concentration ratio** measures the combined market share of the top 'n' firms in the industry.
Market power	**Market power** is the extent to which a firm(s) can influence a product's market price. It refers to the ability of firms to raise prices and profits above the perfectly competitive level.
Minimum Efficient Scale	**Minimum Efficient Scale** is the lowest output at which the firm can produce at so that long-run average costs are minimised. It is represented by the lowest point on the long run average cost curve.
Monopolistic competition	A **monopolistic competitive** market structure is one where there are many firms and freedom of entry into the industry, but where each firm produces a differentiated product and thus has some control over its price.

Monopoly	**Monopoly** refers to a market structure where there is only one firm in the industry. There is no competition since there is only one seller of a unique good with no close substitutes, and there are very high barriers to entry.
Natural Monopoly	A **natural monopoly** is defined as an industry where long run average costs fall throughout the range of market demand.
Normal profit	**Normal profit** (zero economic profit) is the minimum amount of profit a firm must earn to stay in the industry in the long run. (AR = AC)
Oligopoly	An **oligopoly** refers to a market **dominated by a few large firms with high barriers to entry.** Products may be differentiated or homogenous.
Perfect competition	*Perfect* **competition** refers to a market structure where there are many firms, none of which is large; where there is freedom of entry into the industry; where all firms produce an identical product; and where all firms are price takers.
Perfectly competitive markets	**Perfectly competitive markets** refer to markets where free competition exists (Perfect Competition).
Plant	A collection of factors of production at a particular location where production takes place.
Predatory pricing	Where a firm sets its **prices below average cost** to drive competitors out of business (based on the objective of 'market share dominance').
Price discrimination	**Price discrimination** occurs when a producer sells the same commodity to different buyers at different prices **for reasons not associated with differences in cost.**
Production	The process of using *resources* (also known as *Factors of Production* (FOP) – CELL: Capital, Entrepreneurship, Land and Labour) to produce goods or services.
Productive efficiency	**Productive efficiency** is achieved when a given level of output is produced at the lowest cost.
Profit	Profit is the difference between the total revenue received from selling the good and the total cost of producing the good. Profit = Total Revenue – Total Cost.
Salience bias	**Salience bias** refers to the tendency for people to focus on more prominent information over other less prominent but equally relevant pieces of information.
Short Run	Short run is a time period in which there is *at least one fixed factor*.
Subnormal profit	Negative economic profit / loss. (AR – AC < 0)
Sunk cost fallacy	**Sunk cost fallacy** arises when a person's decision is affected by fixed rather than marginal costs.

Supernormal profit	Positive economic profit. It is profit in excess of normal profit. (AR – AC) > 0.
Third-degree price discrimination	**Third-degree price discrimination** refers to efforts taken by a firm to: - raise its price in the market where demand is price inelastic; and - lower its price in the market where demand is price elastic. This enables the firm to earn higher revenue and hence higher profits from both markets than charging a single price.
Total Fixed Costs	Costs that do **not** vary with output.
Total Revenue	**Total Revenue** of a firm is the total amount of money received by a firm from the sale of a given level of output (per time period)**.**
Total Variable Costs	Costs that **vary** directly with output.
Variable Factors	Factors of production that **can** be increased within a given time period.
Vertical integration	Vertical integration takes place when a firm merges with or acquires another firm in the same industry but at a different stage of production.
X-inefficiency	**X-inefficiency** usually occurs when a firm acquires so much market power that it is no longer threatened by potential competitors or new entrants, resulting in complacency and reducing its incentive to keep costs to the lowest.

Selected Past Year A-Level Essay Questions Related To
Firms' Decisions & Strategies

Q1		**2021** Singapore's telecommunications (telco) market is dominated by four firms – SingTel (32%), StarHub (25%) M1 (22%) and new entrant MyRepublic (15%). Commentators argue that Singapore's telco market might be considered to be an oligopoly.	
	a.	~~Explain why Singapore's telco market might be considered to be an oligopoly and how economic theory suggest this market structure would affect the firms' pricing and output decisions.~~	[10]
	b.	Discuss how government intervention in Singapore's telco market could protect consumers, and consider the extent to which such intervention will be successful.	[15]
Q2		**2020** Expectations of quick service restaurants (QSRs) or fast food chains are changing. Innovation is required to keep abreast of changing consumer taste and to maintain a competitive advantage in Singapore, a market known for its discernment of food. *Adapted from: Ray Chua, How McDonald's keeps winning over Singaporeans, 21 June 2016*	
	a.	~~Explain how the market structure in which fast food chains operate is likely to influence how prices are determined.~~	[10]
	b.	Discuss whether innovation is the best strategy for fast food chains seeking to increase their profits.	[15]
Q3		**2019** According to the Competition and Consumer Commission of Singapore (CCCS), the takeover of Uber by Grab in Singapore has led to 'a substantial lessening of competition'. This has made it harder for new competitors to enter the ride-hailing market. *Source: Adapted from Channel NewsAsia, 5 July 2018*	
	a.	Explain **one** reason why consumers might be better off and **one** reason why consumers might be worse off from Grab's takeover of Uber.	[10]
	b.	Discuss the potential benefits and problems that are likely to be experienced by new competitors considering entering the ride-hailing market dominated by Grab.	[15]

Q4		**2017**	
		In the small island economy of Singapore, producers face different constraints from those in larger economies.	
	a.	Explain how firms in Singapore will be affected by constraints, such as having a small domestic market and a lack of resources.	[10]
	b.	Assess which are the appropriate policies that firms and governments could adopt to overcome such constraints.	[15]
Q5		**2016**	
		In Australia, small and remote communities face high and stable prices for petrol. The petrol is supplied by one or two small petrol stations owned by small independent retailers. Prices are lower and more volatile in the large cities, where there are a large number of big petrol stations owned by a small number of big oil companies.	
		Source: Australian Institute of Petroleum	
	a.	Explain why less market competition might lead to higher and more stable prices.	[10]
	b.	Assess whether differences in the level of competition are likely to be the main reason for differences in the retail prices of petrol in rural and urban areas of Australia.	[15]
Q6		**2015**	
		'Market dominance is the main factor determining the profitability of firms.'	
	a.	Explain how market dominance can influence a firm's price and output decisions.	[10]
	b.	Discuss whether government intervention is always needed when a firm dominates the market.	[15]
Q7		**2013**	
		"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 the 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]

Selected *2018* Other JCs Prelim Exam Essay Questions
Related To Production and Costs:

Q1	ACJC	According to Euromonitor International, Singapore's grocery retail market was worth S$4.3 billion in 2016, with the online grocery retail market valued at S$96 million.	
	a.	Distinguish the characteristics of firms operating in oligopolistic and monopolistically competitive markets.	[10]
	b.	Discuss how increased competition in online grocery retailing would affect the survival of traditional supermarket chains like NTUC FairPrice and Cold Storage.	[15]
Q2	AJC	Ten years ago, it seemed like Walmart had monopoly power when it came to retail. Today, Walmart has been displaced by an online retailer, Amazon. Walmart has had to deal with risks and uncertainty like the trend towards e-commerce and slower economic growth while trying to compete.	
	a.	Explain the factors that a firm considers in deciding whether to be larger.	[10]
	b.	Discuss whether the determination of Walmart's decisions and strategies are more dependent on competitors' actions or business risks and uncertainty.	[15]
Q3	EJC	Many firms have been aggressively expanding overseas. This expansion not only involves selling products in new markets, but also includes offshoring their production. Such expansion has not been welcomed by domestic firms in these overseas markets.	
	a.	Explain why domestic firms might fear such expansion by foreign firms.	[10]
	b.	Discuss the view that the best strategy for domestic firms to respond to increased competition from foreign firms is to cultivate brand loyalty.	[15]
Q4	HCI	International trade is a driving force behind economic growth. According to the World Trade Organization (WTO), there are around 420 regional trade agreements in force around the world in 2016 in which barriers to trade and foreign direct investment are lowered.	
	a.	Explain the cost savings for firms and industries that might arise when their countries are in regional trade agreements.	[10]
	b.	Discuss the likely impact of regional trade agreements on the profitability and efficiency of firms.	[15]
Q5.	MJC	Disruptive technologies include the advent of e-commerce retailing which has led to consumers buying cheaper products online rather than going to a physical location.	
	a.	Explain how the survival of firms is affected by disruptive technologies.	[10]
		Discuss whether increasing competition faced by large retail firms is	

	b.	desirable for the society.	[15]
Q6	**TJC**	The hotel industry in many countries is extremely diversified, ranging from fuss-free budget hotels that serve guests such as backpackers, to luxury hotels that include a wide amenity of services for guests such as business travellers.	
	a.	Explain the different economies of scale present in the hotel industry.	[10]
	b.	Assess whether profit maximisation should always be the goal of different hotels.	[15]