



AQA A Level Economics



Your notes

4. Production, Costs & Revenue

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- * Profit
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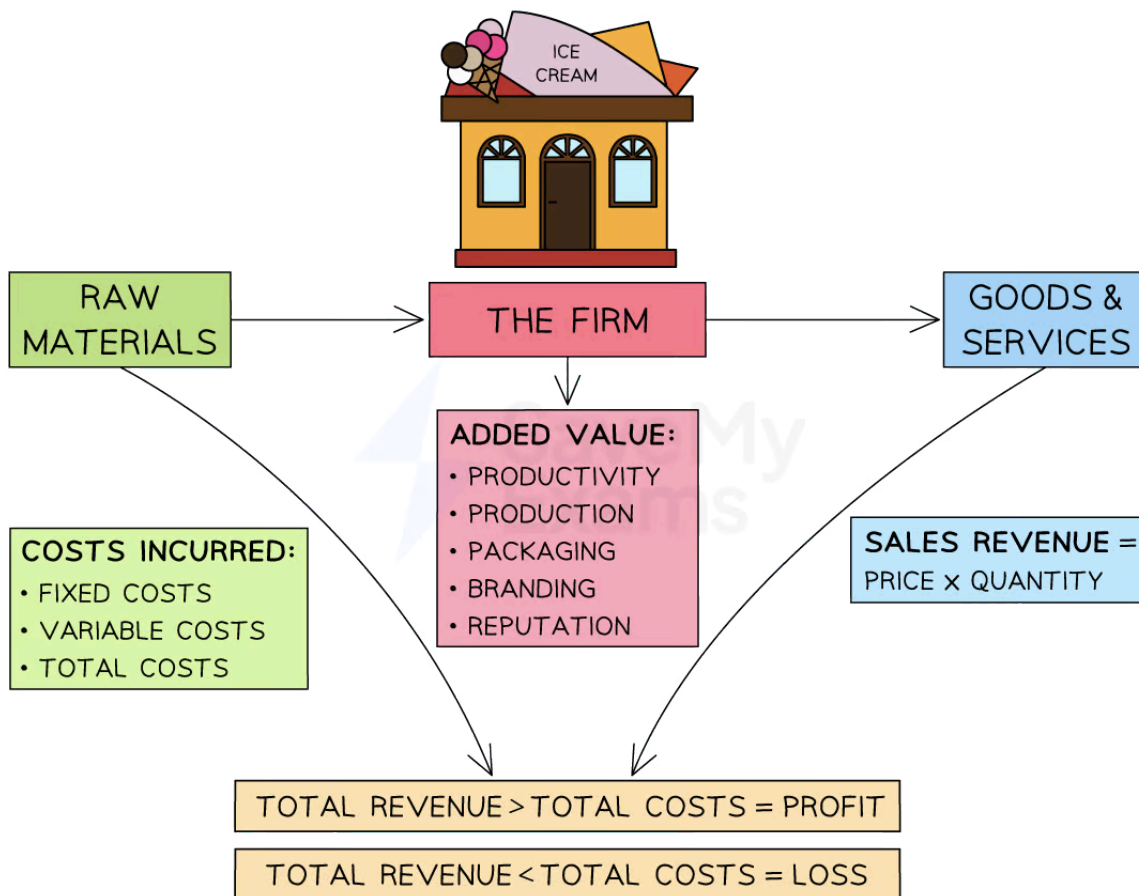
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Production & Productivity

The Purpose of Business Activity

- The purpose of business activity is to **produce goods or services** that **meet customer needs**
- This is accomplished through the process of **production**
 - The factors of production are combined in such a way so as to minimise the costs and maximise the sales revenue
 - Adding value is the process of taking inputs and combining them in such a way that customers find them useful and are willing to pay more for the end product than the value of the raw materials used to manufacture it

Diagram: The Production Process



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The purpose of business activity is to take inputs, add value to them, and create products which meet customer needs



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Diagram analysis

- Raw materials and the other **factors of production** are used to produce goods and services
- Different types of costs are incurred in production, and when the firm sells its products, they receive **sales revenue**
 - If the total costs incurred in the process are less than the sales revenue, the firm will make a profit
 - If the total costs incurred in the process are greater than the sales revenue, the firm will make a loss

Production

- **Production** is the act of **adding value** to the factors of production (such as capital, and labour) to create the goods/services e.g. using tomatoes & basil to create a soup
 - It is the process of **factor conversion** of inputs into final product (goods/services)
 - It is a **measure of output** e.g. 3 cans of soup
- Production is often influenced by the **state of the economy**
 - During a **recession**, production falls
 - During a boom period, production increases
- As production is **dependent on the demand** for goods/services, any change to any of the **conditions of demand** will result in changes to production
- As production is also **dependent on the supply** of the factors of production, any change to any of the **conditions of supply** will result in changes to production

Productivity

- **Productivity** is a **measure of efficiency** that calculates the amount of **outputs produced per unit of input**
 - It calculates **how efficiently** resources are being used in the creation of goods/services & provides a metric for comparison
 - E.g Capital productivity is output per unit of capital
- **Labour productivity** is significant as it is output per worker
 - It is a **measure of efficiency** e.g. 3 cans produced per worker
 - E.g After training workers proved to be 27% more efficient in their **labour productivity**



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- **Higher productivity** is important for a firm & economy for the following reasons
 - It lowers costs & improves a firm's national & international **ability to compete**
 - It allows firms to **produce more output** with the same input which puts it in a position to generate increased **economies of scale**
 - Firms can generate higher profits
 - Higher profits may mean that the firm can **pay their workers more**
 - Higher profits may mean that the **government revenue** from **corporation tax** will increase
 - An improved ability to compete in international markets will help to generate **economic growth**



Worked Example

The table shows the number of pairs of luxury wool socks produced by Scotty Socks Ltd. in 2021 and 2022.

Year	Units Produced
2021	46,000
2022	69,000

In 2021, Scotty Socks employed 50 staff. In 2022, the number of staff employed by the business increased by 20%.

Calculate the percentage change in labour productivity between 2021 and 2022. (4)

Step 1: Calculate the labour productivity for 2021

$$\frac{46,000 \text{ units}}{50 \text{ workers}} \quad (1 \text{ mark})$$

$$= 920 \text{ units per worker}$$

Step 2: Calculate the labour productivity for 2022

$$\frac{69,000 \text{ units}}{60 \text{ workers}} \quad (1 \text{ mark})$$

$$= 1,150 \text{ units per worker}$$



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Step 3: Calculate the percentage difference between the two years ((new-old) / old)

$$\frac{1,150 - 920 \text{ units}}{920 \text{ units}} \times 100 \quad (1 \text{ mark})$$

$$= 25 \%$$

Step 4: Identify whether the percentage difference is an increase or decrease

Labour productivity has increased from 920 to 1,150 units so it is a 25% percentage **increase** (1 mark)



Your notes

Specialisation & Division of Labour

Specialisation & the Division of Labour

- Scotsman **Adam Smith** is often referred to as the 'father of economics'.
- He published '**The Wealth of Nations**' in March 1776 and explained many fundamental economic principles that we still use today
 - The premise of the book was to discuss how to **increase productivity** and **wealth**
- Based on observations made during a visit to a pin factory, he developed the ideas of **specialisation** and the **division of labour**
 - He noted that a single worker could not make more than 20 pins a day as it involved around 18 different processes, such as cutting the wire, sharpening the end, stamping the head, etc.
 - However, if the labour was **divided up into different tasks** and workers **specialised in just that one task**, Adam Smith estimated that just 10 workers could produce 48,000 pins per day

Diagram: Worker making steel pins



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The division of labour takes one task and breaks it into multiple processes. A worker then specialises in each process and is more productive

- The **division of labour** is when a **task is broken up** into several component tasks
 - This allows workers to **specialise** by focusing on one (or a few) of the components that make up the production process and thereby gain significant skill in doing it
 - This results in higher **output per worker** and so increases productivity
- **Specialisation** occurs on several different levels
 - On an individual level
 - On a business level. For example, one firm may only specialise in manufacturing drill bits for concrete work
 - On a regional level. For example, Silicon Valley has specialised in the tech industry
 - On a global level as countries seek to trade. For example, Bangladesh specialises in textiles and exports them to the world

Benefits of Specialisation & Division of Labour for Consumers, Firms & Society

Stakeholder	Explanation
Consumers	<ul style="list-style-type: none"> ▪ Lower costs can be passed on to consumers in the form of lower prices ▪ Increased variety of goods available due to international trade
Firm	<ul style="list-style-type: none"> ▪ Lower costs can mean higher profits for firms. This may lead to higher wages for workers ▪ Higher labour productivity lowers cost / unit for firms, which makes their goods more competitive internationally (exports)
Society	<ul style="list-style-type: none"> ▪ Increased exports can result in economic growth for the nation ▪ It creates many low skilled jobs ▪ Income gained from exports can be used to purchase other goods from around the world (imports). This increases the variety of goods available in a country

Facilitating the Exchange of Goods & Services

- Prior to the **creation of money**, individuals and firms had to accept other goods or services as payment, or be **self-sufficient** by producing everything required



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- Often lacking self-sufficiency or driven by the **desire for a wider range** of goods/services, **bartering** became the norm but it too had problems
- As individuals and firms **trade** with each other in order to acquire goods or raw materials, they **require a means of exchange** that is acceptable and easy to use
- Modern **currency** fulfils this purpose, & money functions as **a medium of exchange, a measure of value, a store of value, and a method of deferred payment**

The Four Functions of Money

A Medium of Exchange	A Measure of Value	A Store of Value	A Method of Deferred Payment
<ul style="list-style-type: none"> ▪ Without money, it becomes necessary for buyers and sellers to barter (exchange goods) ▪ Bartering is problematic as it requires two people to want each other's goods (double co-incidence of wants) ▪ Money easily facilitates the exchange of goods, as no double co-incidence of wants is necessary 	<ul style="list-style-type: none"> ▪ Money provides a means of assigning value to different goods and services ▪ Knowing the price of a good in terms of money allows both consumers and producers to make decisions in their best interests ▪ Without this measure, it is difficult for buyers and sellers to arrange an agreeable exchange 	<ul style="list-style-type: none"> ▪ Money holds its value over time (of course inflation means that is not always true!) ▪ This means that money can be saved ▪ It remains valuable in exchange over long periods of time 	<ul style="list-style-type: none"> ▪ Money is an acceptable way to arrange terms of credit (loans) & to settle any future debts ▪ This allows producers & consumers to acquire goods in the present & pay for them in the future



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Diminishing Returns & Returns to Scale

Key Cost Curve Definitions

- The short-run is that period of time in which at least one factor of production is fixed
 - E.g. It is difficult to change machinery or the number of factories in the short run, but that can be achieved in the long run
 - The variable factor of production that is usually added to production is labour, as it is easy to hire new workers
- The long-run is that period of time in which all of the factors of productions are variable
 - This is also called the **planning stage**, as firms can plan for increased capacity and production

Marginal, Average & Total Returns

Concept	Explanation	Example
Marginal returns	<ul style="list-style-type: none"> ▪ Refers to the additional output gained from increasing one unit of input (labour) while keeping all other inputs constant 	<ul style="list-style-type: none"> ▪ If a factory hires one more worker and the total output increases from 100 to 110 units, the marginal return of the additional worker is 10 unit
Total returns	<ul style="list-style-type: none"> ▪ Is the overall output obtained from a given level of input (units of labour) 	<ul style="list-style-type: none"> ▪ If a factory hires 10 workers and the total output is 220 units, the total returns is 220 units
Average returns	<ul style="list-style-type: none"> ▪ Is the total output divided by the total input (units of labour). It provides a measure of efficiency or productivity over a period 	<ul style="list-style-type: none"> ▪ If a factory employs 8 workers and produces 200 units of output, the average return per worker is 25 units (200 units / 8 workers = 25 units per worker).

Short Run: The Law of Diminishing Marginal Returns

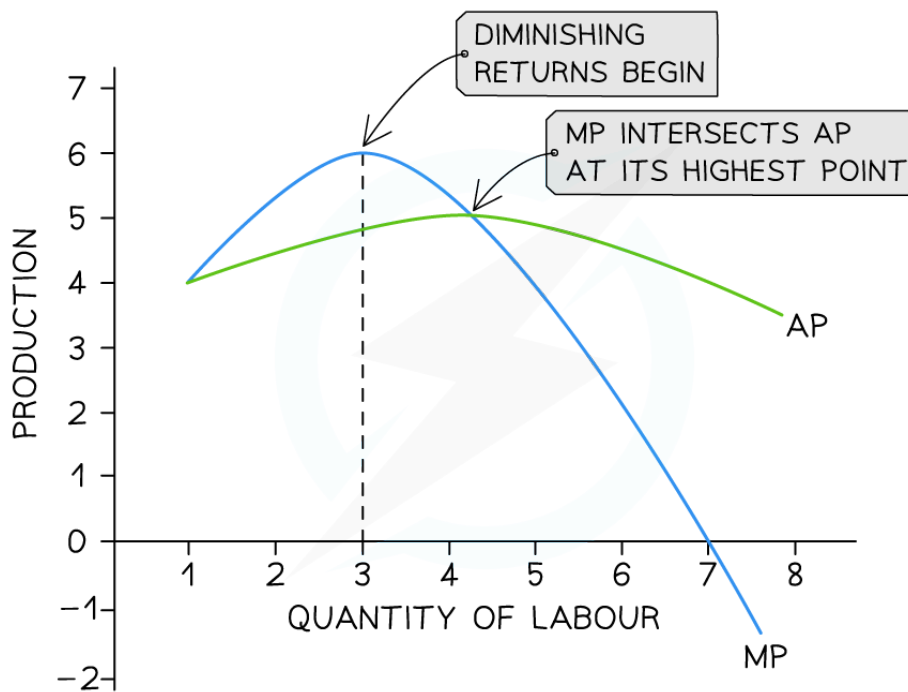
- The **Law of Diminishing Marginal Returns** states that as more of a variable **factor of production** (e.g. labour) is added to fixed factors (e.g. capital), there will initially be an increase in productivity
 - However, a point will be reached where adding **additional units of the factor** (e.g. hiring an extra worker) begins to decrease **productivity** due to the relationship between labour and capital
- Consider a farmer who has a fixed amount of land and **hires additional workers** to cultivate the crops:



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- Initially, each additional worker contributes to a **significant increase in crop output**
- However, as more workers are hired, the **additional output generated by each new worker starts to decline**
- This is because the fixed amount of land and other resources become increasingly crowded relative to the growing labour force, leading to **diminishing returns from each additional worker**
- The law of diminishing marginal returns **is a short-run concept**

Diagram: The Law of Diminishing Marginal Returns



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In the short run, marginal return (MR) increases with the addition of three workers before diminishing returns for each additional worker begin

Diagram analysis

- A small food van selling burgers (product) at a music festival **increases productivity** up to the addition of a third worker
- After that, workers get in each other's way and there is not enough **grill space (capital)** and the marginal return of each worker no longer increases
- If more workers are hired, then the marginal return of each additional worker begins to fall

- Adding additional workers up to the 7th worker will keep increasing the **total returns**
- With the hiring of the 7th worker, the **marginal return turns negative**, which will decrease the total product



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Long run: Returns to Scale

- **Long run returns to scale refer to the relationship between inputs and outputs in the long-run**
 - It is an analysis of how changes in the **scale of production** affect the level of output when all inputs can be adjusted
- Analysing long run returns to scale helps firms **make decisions about optimal scale and size of production** to maximise profitability and efficiency over the long term
- There are three possibilities regarding long-run returns to scale

1. Increasing returns to scale

If all the inputs are increased by a certain proportion, and the output increases by a larger proportion, there are increasing returns to scale. The firm is experiencing **economies of scale**, where production becomes more efficient as it grows

2. Constant returns to scale

If all inputs are increased by a certain proportion, and the output increases by the same proportion, there are constant returns to scale. The firm's level of efficiency remains constant as it scales up production

3. Decreasing returns to scale

If all inputs are increased by a certain proportion, and the output increases by a smaller proportion, there are decreasing returns to scale. The firm is experiencing **diseconomies of scale**, where production becomes less efficient as it expands



Your notes

Costs of Production

Different Types of Costs

- In preparing goods/services for sale, **firms incur a range of costs**. These costs can be broken into different categories
- 1. **Fixed costs (FC)** are costs that do not change as the level of output changes
 - These have to be paid whether output is zero or 5000
 - E.g. Building rent, management salaries, insurance, bank loan repayments, etc.
- 2. **Variable costs (VC)** are costs that vary directly with output
 - These increase as output increases, & vice versa
 - E.g. Raw material costs, wages of workers directly involved in production
- 3. **Total costs (TC)** are the sum of the fixed + total variable costs

The distinction between short run and long run costs

- The distinction between **short run and long run costs** revolves around the degree of flexibility in adjusting inputs (the factor of production)
- **In the short run**, some inputs are fixed and cannot be varied easily, such as capital equipment or the size of the production facility
 - Variable inputs like labour and raw materials can to a certain extent be adjusted
 - Short run costs include both fixed and variable costs, but the state of capital is fixed
- **In the long run**, all inputs are able to change
 - Firms have the flexibility to adjust their production processes, expand or contract their scale of operations, and invest in new capital equipment
 - Consequently, **all costs become variable** as firms can make adjustments to their input mix to **optimise production efficiency**

Cost Calculations & Cost Graphs

- Based on the above definitions, we can calculate several different types of costs
- 1. Total costs (TC) = total fixed costs (TFC) + total variable costs (TVC)



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2. Total variable cost (TVC) = variable cost (VC) \times quantity (Q)

3. Average total cost (AC) = $\frac{\text{total cost (TC)}}{\text{quantity (Q)}}$

4. Average fixed cost (AFC) = $\frac{\text{Total fixed costs (TFC)}}{\text{quantity (Q)}}$

5. Average variable cost (AVC) = $\frac{\text{Total variable costs (TVC)}}{\text{quantity (Q)}}$

Cost Calculations Using the Above Formulas Where VC is \$60

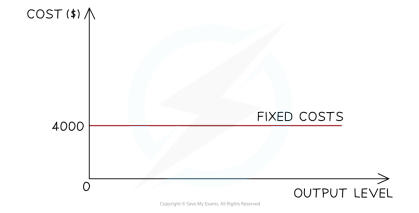
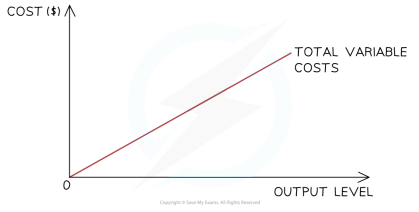
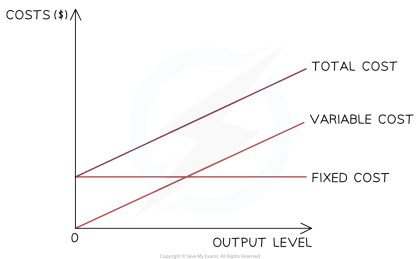
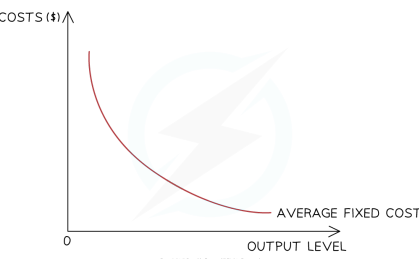
Output (Q)	TFC	TVC = \$60 \times Q	TC = TFC + TVC	AFC = $\frac{\text{TFC}}{\text{Q}}$	AVC = $\frac{\text{TVC}}{\text{Q}}$	AC = $\frac{\text{TC}}{\text{Q}}$
0	200	-	200	-	-	-
1	200	60	260	200	60	260
2	200	120	320	100	60	160
3	200	180	380	66.67	60	126.67
4	200	240	440	50	60	110
5	200	300	500	40	60	100
6	200	360	560	33.34	60	93.33
7	200	420	620	28.58	60	88.57
8	200	480	680	25	60	85

A Graphical Representation of Costs

Type of Cost	Diagram	Explanation



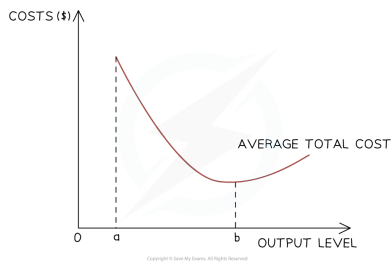
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Fixed Cost (FC)		<ul style="list-style-type: none"> The firm has to pay its fixed costs which do not change, irrespective of whether the output is 0 or 100,000 units The fixed costs for this firm are \$4,000
Variable Cost (VC)		<ul style="list-style-type: none"> The variable costs initially rise proportionally with output, as shown in the diagram At some point, the firm will benefit from a purchasing economy of scale and the rise will no longer be proportional
Total Cost (TC)		<ul style="list-style-type: none"> The total cost is the sum of the variable & fixed costs The total costs cannot be zero, as all firms have some level of fixed costs
Average Fixed Cost (AFC)		<ul style="list-style-type: none"> If the fixed costs of a firm are \$1,000 and it produces 1 unit of output, then its AFC is \$1,000 ($\\$1,000/1$) If the firm increases its output to 1000 units, then the AFC is \$1 per unit ($\\$1000/1,000$) The more units a firm produces, the lower its AFC will be This is one reason why large levels of output help to increase the profit per unit



Your notes

Average Total Cost (AC)



- As a firm grows, it is able to increase its **scale of output** generating efficiencies that lower its **average total costs (AC)** of production
- These efficiencies are called **economies of scale**
- As a firm continues increasing its **scale of output**, it will reach a point where its **average total costs (AC)** will start to **increase**
- The reasons for the increase in the average costs are called **diseconomies of scale**



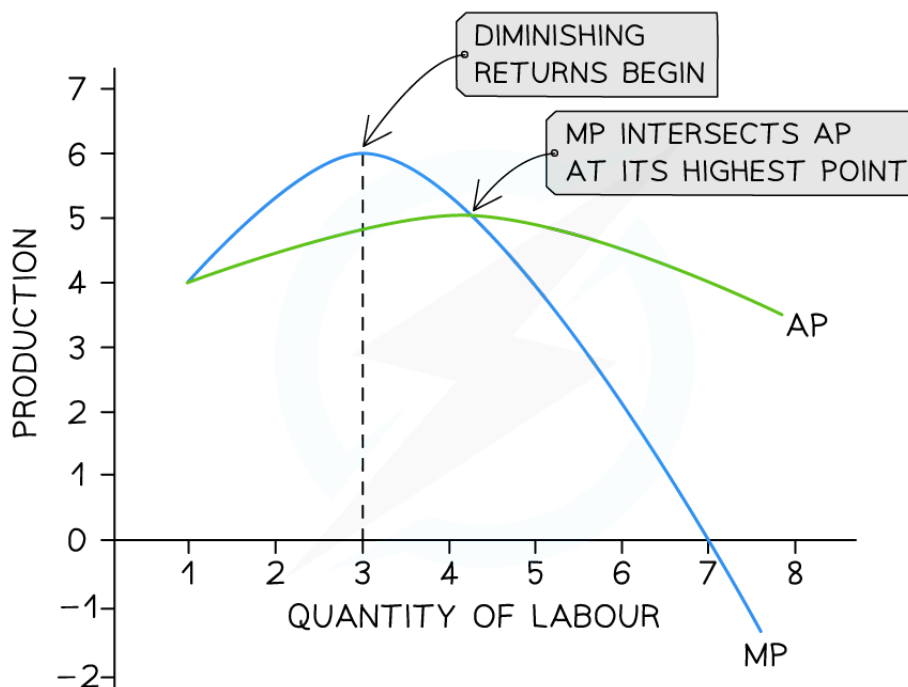
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Explaining the Shapes of the Cost Curves

Diminishing Returns Shape the Short-run Cost Curves

- In the **short-run**, the shapes of the cost curves (AC, AVC & MC) are determined by the **law of diminishing marginal returns**. This fully explained on the page [Diminishing Returns & Returns to Scale](#)

Diagram: The law of Diminishing Marginal Returns



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In the short run, marginal returns (MR) increase with the addition of three workers, after which diminishing returns occur with the addition of each individual worker

Diagram analysis

- A small food van selling burgers (product) at a music festival **increases productivity** up to the addition of a third worker
 - After that, workers get in each other's way and there is not enough **grill space (capital)** and the marginal return no longer increases
 - If more workers are hired, then the **marginal return** of each additional worker begins to fall



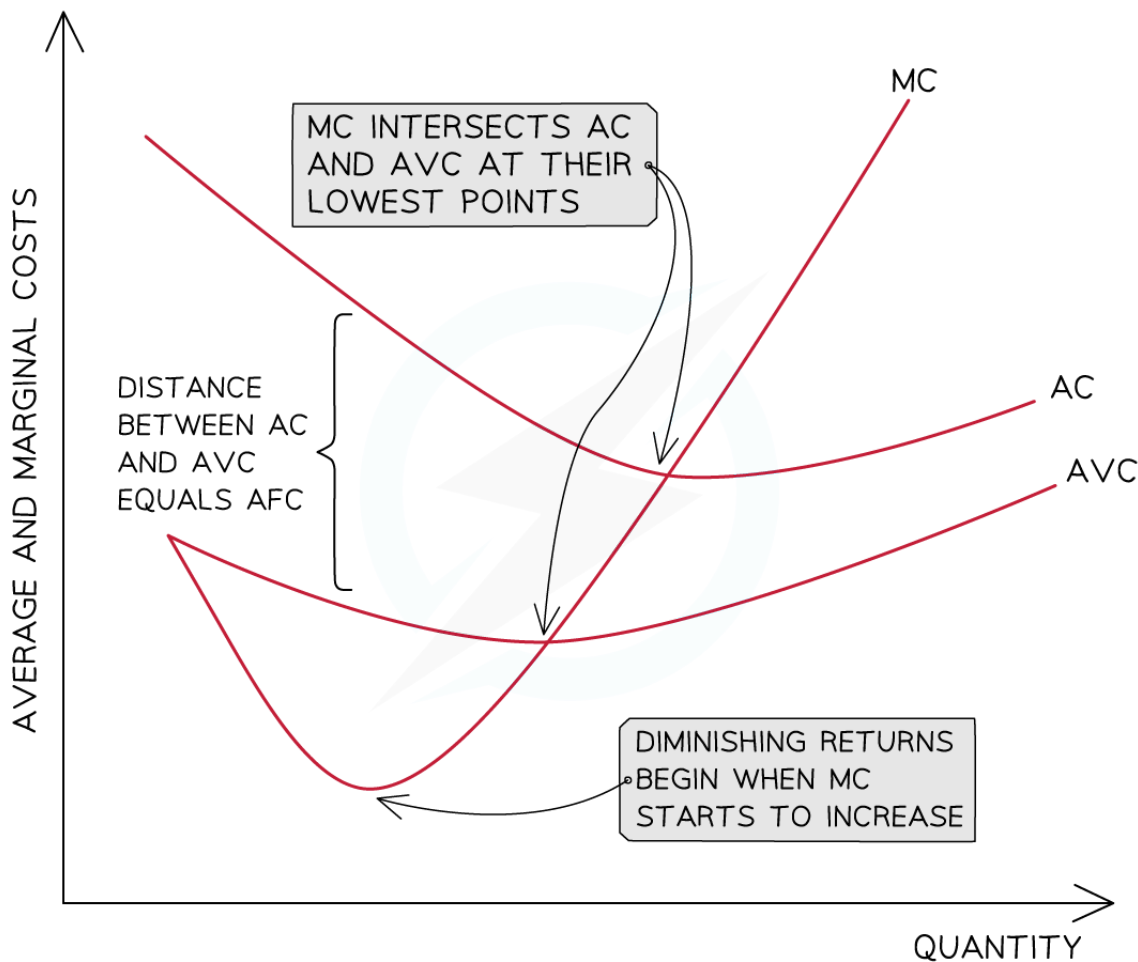
Your notes

- Adding additional workers up to the 7th worker will keep increasing the **total output**
 - With the hiring of the 7th worker, the **marginal return turns negative**, which will decrease the total output

Using diminishing marginal returns to explain the short-run cost curves

- As the marginal returns **increase**, the **marginal costs decrease**
 - There is an inverse relationship
 - Increasing returns = decreasing costs
 - Decreasing returns = increasing costs

Diagram: Connecting the Shapes of the Short Run Cost Curves



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The marginal cost curve is the supply curve of a firm. Marginal costs fall as long as there are increasing marginal returns

Diagram analysis

- The **distance** between the **average variable cost (AVC)** and the **average cost (AC) = the average fixed cost (AFC)**
 - AVC converges towards AC as the **AFC continuously decreases** with an increase in output
 - AVC decreases as **additional workers are added** and each worker produces additional product
- **Marginal costs (MC)** decrease initially as additional workers are added & the **marginal product** is increasing
- **Diminishing returns** begin when the MC starts to increase
- MC will cross the AVC and AC curves at their **lowest point**
 - As long as the **cost** of producing the next unit (MC) is **lower than the average**, it will pull down the average
 - When the **cost** of producing the next unit (MC) is **higher than the average**, it will pull up the average

The Impact of Costs & Productivity on Factor Inputs

- Factor prices (raw materials, wages, etc) and **productivity** shape a firm's **costs of production** and influence its choice of factor inputs
 - Factor inputs used in the production process can either be **capital-intensive** or **labour-intensive**

The influence of factor prices on costs

- **Higher factor prices increase production costs**, e.g. if wages rise due to labour market conditions or changes to the national minimum wage, a firm's labour costs will increase
- **Lower factor prices reduce production costs** e.g. if the cost of capital decreases, possibly due to interest rate reductions that make repayments more affordable, a firm's costs of production decrease
- Firms aim to minimise costs by selecting the optimal combination of inputs that maximises output

The influence of productivity on costs

- Productivity measures the efficiency with which **inputs are utilised to produce output**
- Higher productivity means **more output** can be produced with the **same level of inputs**
 - Improved productivity lowers a firm's production costs by reducing the number of inputs required to produce a given level of output

- E.g. If technological advancements allow workers to produce more units per hour, the firm's labour costs per unit decrease
- **Lower productivity increases costs** because more inputs are needed to produce the same level of output
 - If workers become less efficient or if capital equipment becomes outdated, a firm's costs of production rise



Your notes

The Influence of factor price and productivity on input

- Firms choose between capital and labour inputs based on factor prices and productivity levels
 - If **capital (machinery) costs** are low relative to labour costs and capital is highly productive, firms may opt to use more capital-intensive production methods
 - If labour costs are low and labour is highly productive, firms may prefer labor-intensive methods



Your notes

Economies & Diseconomies of Scale

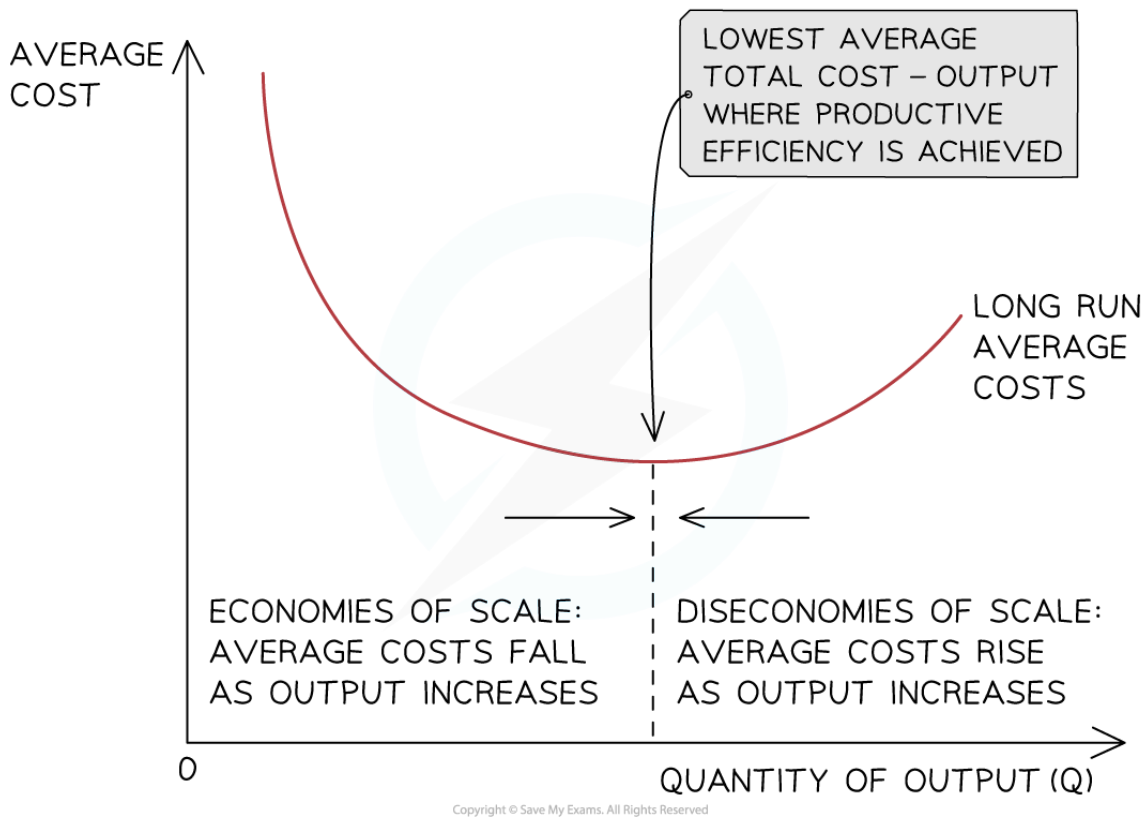
An Introduction to Economies & Diseconomies of Scale

- As a firm grows, it is able to increase its **scale of output**, generating efficiencies that lower its **average costs (AC)** of production
 - These efficiencies are called **economies of scale**
 - Economies of scale help large firms **lower their costs of production** beyond what small firms are able to achieve
- As a firm continues to increase its **scale of output**, it will reach a point where its **average costs (AC)** will start to **increase**
 - The reasons for the increase in average costs are called **diseconomies of scale**
- Economies of scale are the reason that firms generate **increasing returns to scale** in the long run
- Diseconomies of scale are the reason that firms experience **decreasing returns to scale** in the long run

Diagram: Long-run Average Cost Curve



Your notes



Economies of scale occur when average costs decrease with increasing output, and diseconomies of scale occur when average costs increase with increasing output

Diagram analysis

- With relatively low levels of output, the firm's average costs are high
- As the firm increases its output, it begins to benefit from **economies of scale**, which lower the average cost per unit
- At some level of output, a firm will **not be able to reduce costs** any further; this point is called **productive efficiency**
- Beyond this level of output, the average cost will begin to rise as a result of **diseconomies of scale**

Types of Internal Economies of Scale

- **Internal economies of scale** occur as a result of the growth in the scale of production **within** the firm

- There are several factors that can generate internal economies of scale



Your notes

Types of Internal Economies of Scale

Internal Economy of Scale	Explanation
<ul style="list-style-type: none"> Financial economy of scale 	<ul style="list-style-type: none"> Large firms often receive lower interest rates on loans than smaller firms, as they are perceived as less risky. A cheaper loan lowers the AC
<ul style="list-style-type: none"> Managerial economy of scale 	<ul style="list-style-type: none"> It occurs when large firms can employ specialist managers who are more efficient at certain tasks, and this efficiency lowers the AC. Managers in small firms often have to fulfil multiple roles and are less specialised
<ul style="list-style-type: none"> Marketing economy of scale 	<ul style="list-style-type: none"> Large firms spread the cost of advertising over a large number of sales, and this reduces the AC. They can also reuse marketing materials in different geographic regions, which further lowers the AC
<ul style="list-style-type: none"> Purchasing economy of scale 	<ul style="list-style-type: none"> This occurs when large firms buy raw materials in greater volumes and receive a bulk purchase discount, which lowers the AC
<ul style="list-style-type: none"> Technical economy of scale 	<ul style="list-style-type: none"> Occur as a firm is able to use its machinery at a higher level of capacity due to the increased output, thereby spreading the cost of the machinery over more units and lowering the AC
<ul style="list-style-type: none"> Risk bearing economy of scale 	<ul style="list-style-type: none"> It occurs when a firm is able to spread the risk of failure by increasing its numbers of products, i.e greater product diversification; less failure lowers AC

Types of External Economies of Scale

- External economies of scale** occur when there is an increase in the size of the industry in which the firm operates
 - The firm is able to benefit from lower **average costs (AC)** generated by factors **outside of the firm**

Sources of External Economies of Scale

Source	Explanation
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Geographic cluster	<ul style="list-style-type: none"> As an industry grows, ancillary firms move closer to major manufacturers to cut costs & generate more business. This lowers the AC e.g. car manufacturers in Sunderland rely on the service of over 2,500 ancillary firms
Transport links	<ul style="list-style-type: none"> Improved transport links develop around growing industries in order to help get people to work & to improve transport logistics. This lowers the AC e.g. Bangalore is known as India's Silicon Valley, and transportation projects have been successful in transforming the movement of people & goods
Skilled labour	<ul style="list-style-type: none"> An increase in skilled labour can lower the cost of skilled labour, thereby lowering the AC. The larger the geographic cluster, the larger the pool of skilled labour
Favourable legislation	<ul style="list-style-type: none"> This often generates significant reductions in AC as governments support certain industries in order to achieve their wider objectives

Types of Diseconomies of Scale

- As a firm continues to increase its **scale of output in the long-run**, at some point its long run average cost (LRAC) will start to **increase**
- The reasons for the increase in the LRAC are called diseconomies of scale
 - During this period, the firm is facing decreasing returns to scale

Causes of Diseconomies of Scale

Source	Explanation
Management diseconomy of scale	<ul style="list-style-type: none"> Occur when managers work more in their own interest than in the interest of the firm, e.g managers become territorial and obstructive thus reducing efficiency and increasing the AC
Communication diseconomy of scale	<ul style="list-style-type: none"> Occur when a firm with multiple layers of management & perhaps in multiple geographic locations, struggle to communicate quickly & efficiently leading to slow responses & increased AC



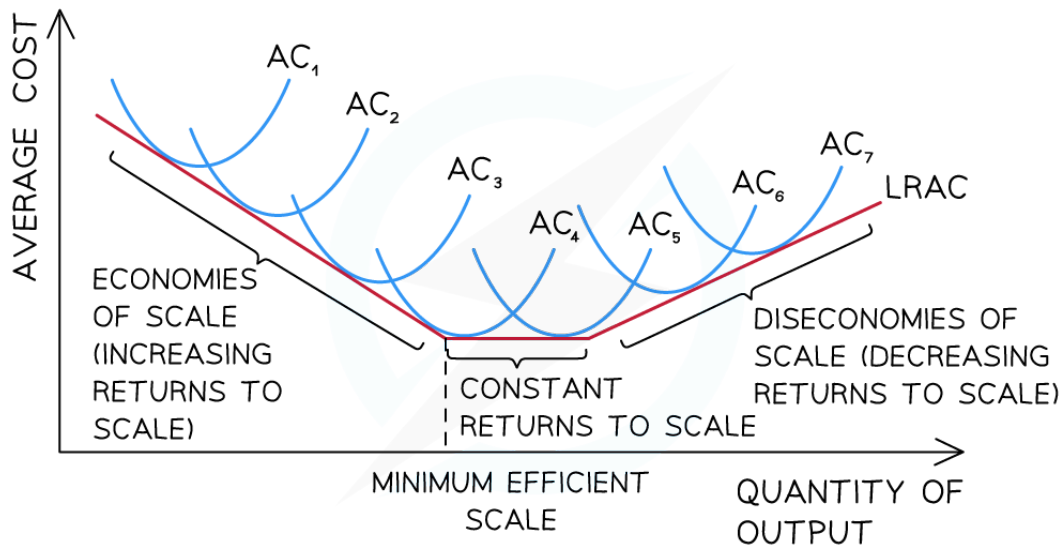
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Geographical diseconomy of scale	<ul style="list-style-type: none"> Occur when a firm has widespread bases of operations & this leads to logistical and communication challenges which can raise the AC
Cultural diseconomy of scale	<ul style="list-style-type: none"> Occur when a firm expands into foreign markets in which workers have very different cultural work/productivity norms which can raise the AC

Increasing, Constant & Decreasing Returns to Scale

- The **minimum efficient scale** is the lowest cost point on a **long-run average total cost (LRAC)** curve
 - It represents the **lowest possible cost per unit** that a firm in the industry can achieve in the long run

Diagram: Increasing and Decreasing Returns to Scale



As a firm grows, economies of scale help it reach its minimum efficient scale, before diseconomies raise the cost/unit again

Diagram analysis

- In the **short-run**, the firm operates on its short-run average cost curve
- In the long-run, the firm will increase its capacity (e.g. build a new factory), and then operate for a period of time on a new short-run cost curve

- Each subsequent short-run average cost (SRAC) curve **represents growth** and an increase in size
- **Output increases** with each period of growth
- Initially, firms experience **increasing returns to scale** as a result of the **economies of scale**
- At a certain level of output, the firm will reach the **minimum efficient scale** where it experiences **constant returns to scale**
- If it continues to grow beyond that level of output, the firm will experience **decreasing returns to scale** as **diseconomies of scale** occur



Your notes

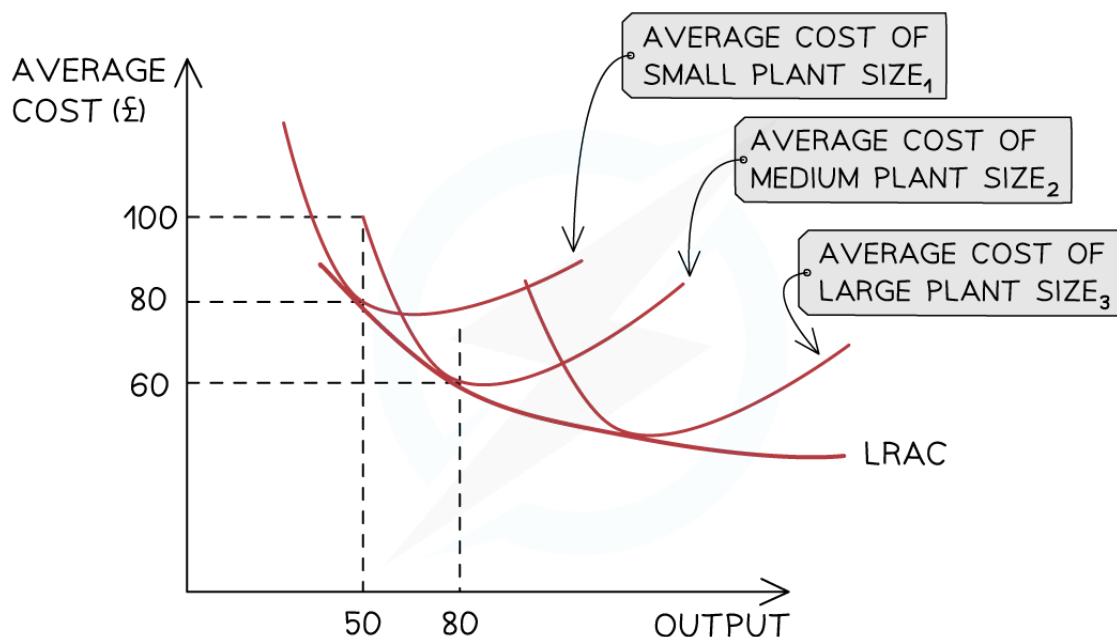


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Short-run & Long-run Relationships

Short-run and Long-run Average Costs Curves

- Day to day operations of a firm occur in the **short-run**
- In the **long-run**, they are able to **plan** to increase the **scale of production**
 - E.g by increasing the size of the factory
 - Larger scale = more output** & the firm moves onto a **new SRAC curve** in which the average unit costs are lower
- In the **long-run**, a growing firm is likely to keep repeating this process,
 - Each time a **more efficient SRAC** is generated
- The **long-run average cost curve (LRAC)** is the line of best fit between the lowest points of the **short-run ATC curves**



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The LRAC curve is generated by the addition of successive SRAC as the firm expands its scale of production

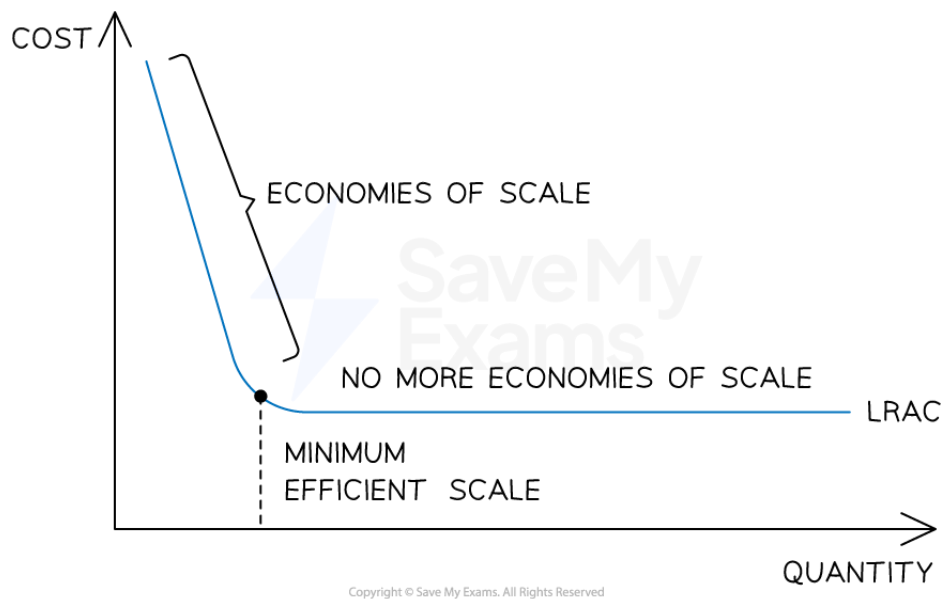


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The L-shaped Long-run Average cost Curve

- The **L-shaped long-run average cost curve** is a variation of the normal long-run average cost curve and suggests that in some instances, diseconomies of scale will **not cause the LRAC to turn upwards**
 - In some industries, the curve may well continue to be relatively flat
- This idea results in a loosely shaped L shaped long-run cost curve (not U-shaped)

Diagram: the L-shaped Long-run Cost Curve



In some industries, it is possible to achieve a minimum efficient scale and a firm can continue to operate at this level indefinitely

Diagram analysis

- Assume a utility company spends \$billions **building out a new delivery network**
- Their average total costs (ATC) are **initially very high**, but fall as they are able to gain **economies of scale**
- At some point, they will be operating at their lowest possible cost level (minimum efficient scale)
- They will continue operating at this level



Your notes

Marginal, Average & Total Revenue

Defining Total, Average & Marginal Revenue

- Total revenue** is the total value of all sales a firm incurs

$$\text{Total revenue (TR)} = \text{selling price (P)} \times \text{quantity sold (Q)}$$

- Average revenue** is the overall revenue per unit

$$\text{Average revenue (AR)} = \frac{\text{TR}}{\text{Q}}$$

- Marginal revenue** is the extra revenue received from the sale of an additional unit of output

$$\text{Marginal revenue (MR)} = \frac{\Delta \text{ in TR}}{\Delta \text{ in Q}}$$

- The relationship between TR, AR & MR is different in **perfect competition** and **imperfect competition**

Revenue in perfect competition

The Relationship Between TR, AR & MR in Perfect Competition

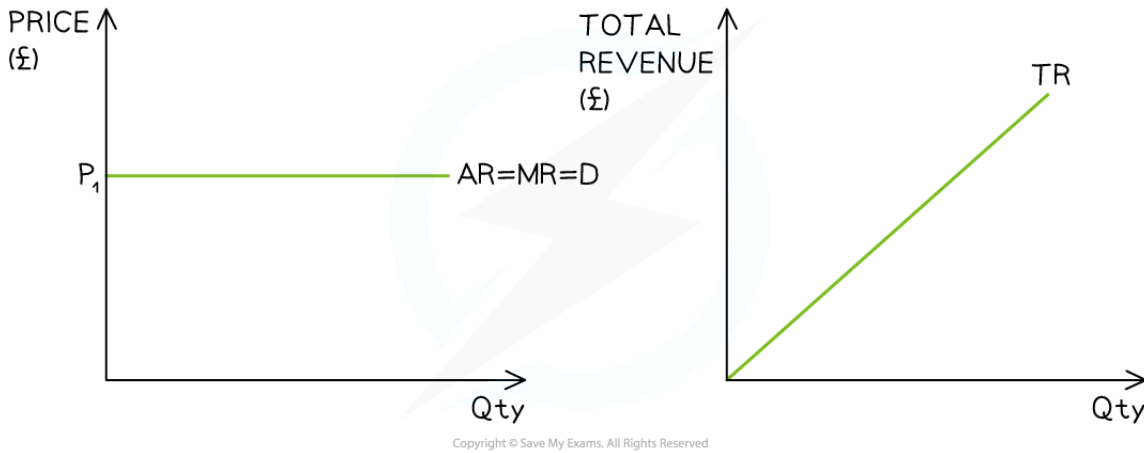
P (£)	Q	TR (P × Q)	AR $\frac{\text{TR}}{\text{Q}}$	MR $\frac{\Delta \text{ in TR}}{\Delta \text{ in Q}}$
8	5	40	8	8
8	6	48	8	8
8	7	56	8	8
8	8	64	8	8

- The situation in the table above is illustrated in the diagram below

Diagram: The Relationship Between Average Revenue & Marginal Revenue



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An illustration of the relationship between AR, MR & TR in a perfectly competitive market

Observations

- The firm is a **price taker** at P_1 (£8)
 - Every unit of output is sold at the same price
 - A higher price would decrease sales to zero
 - A lower price would result in all sellers lowering their price
- TR increases at a constant rate
- **MR = AR = Demand**

Revenue in imperfect competition

The Relationship Between TR, AR & MR for Imperfect Competition

P (£)	Q	TR ($P \times Q$)	AR $\frac{TR}{Q}$	MR $\frac{\Delta \text{ in TR}}{\Delta \text{ in Q}}$
8	1	8	8	8
7	2	14	7	6
6	3	18	6	4

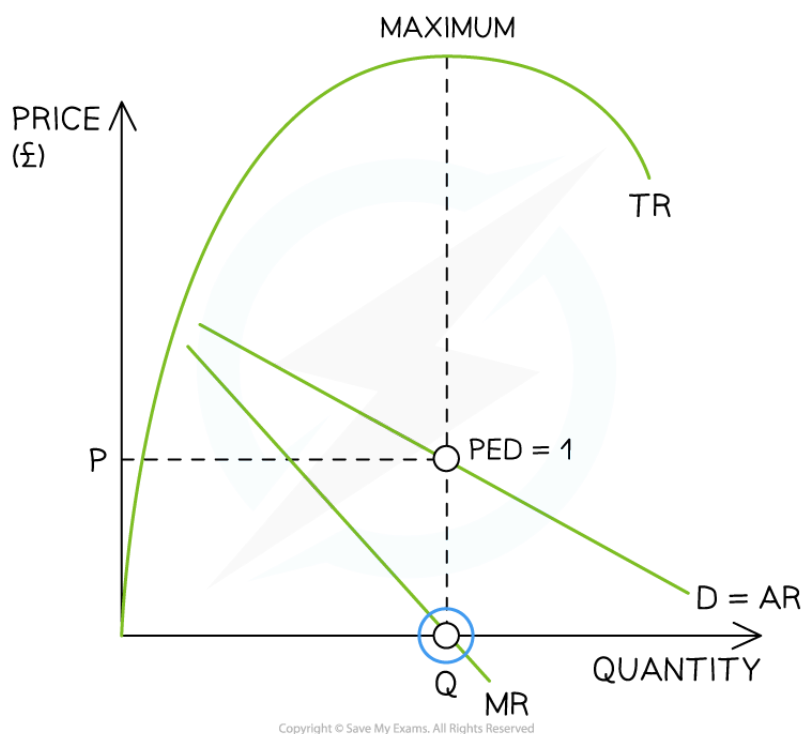


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5	4	20	5	2
4	5	20	4	0
3	6	18	3	-2
2	7	14	2	-4
1	8	8	1	-6

- The situation in the table above is illustrated in the diagram below

Diagram: Average Revenue & Marginal Revenue in Imperfect Competition



An illustration of the relationship between AR, MR & TR for imperfect competition

Observations

- The firm is a **price maker**
 - In order to sell an additional unit of output, the **price (AR)** must be lowered
 - Both **AR and MR fall** with additional units of sale
 - When the AR falls, the **MR falls by twice as much**
 - The gradient of the MR curve is **twice as steep** as the AR curve
 - TR is maximised when $MR = 0$
- AR is the demand (D) curve
- From the point where $MR = 0$, the total revenue begins to fall



Your notes



Your notes

Profit

Normal Profit, Supernormal Profit & Losses

- When calculating costs, Economists consider both the **explicit** and **implicit** costs of production
 - Explicit costs are the costs which **have to be paid** e.g raw materials, wages etc.
 - Implicit costs are the **opportunity costs** of production
 - This is the cost of the next best alternative to **employing the firm's resources**
 - E.g. if an investor puts £1m into producing bicycles & they could have put it in the bank to receive 5% **interest**, then the 5% represents an **implicit cost**
 - Implicit costs must be considered, as entrepreneurs will rationally reallocate resources when **greater profits** can be made elsewhere
- **Profit = total revenue (TR) – total costs (TC)**
 - Total costs include explicit and implicit costs
- **Normal profit occurs when TR = TC**
 - This is also called breakeven
- **Abnormal (supernormal) profit occurs when TR > TC**
- **A loss occurs when TR < TC**

Profit Calculations

Output	TR (£)	TC (£)	Profit (TR – TC)
5	150	70	80
6	180	96	84
7	210	210	0
8	240	260	-20

Observations

- **Supernormal profit** occurs up to the 6th unit of output

- **Normal profits** occur at the 7th unit
- From the 8th unit, the firm is making a **loss**

The role of Profit in a Market Economy

- Profit plays a central role in a market economy

1. Profit is an incentive for innovation and entrepreneurship

- Profit serves as a reward for successful entrepreneurship and innovation
- Entrepreneurs take on risks to start businesses or develop new products/services with the expectation of making a profit
- It encourages individuals to innovate, leading to economic growth and improved standards of living

2. Allocation of resources

- In a market economy, profit serves as a signal for resource allocation
- When businesses earn profits, it indicates that they are **meeting consumer demands efficiently**
- This encourages the reallocation of resources (capital, labour, and land) towards the production of goods and services that consumers value most, thereby enhancing economic efficiency

3. Competition

- Profit serves as a measure of business success and efficiency
- In a competitive market, firms strive to maximise profit by improving productivity, lowering costs or enhancing the quality of goods and services
- This competition benefits consumers by providing them with better products at lower prices

4. Economic growth

- Profitable businesses reinvest their earnings into expanding operations, research and development, and hiring more workers
- This investment stimulates economic growth, creates jobs, and **generates technological advancements**

5. Wealth creation

- Profit generation leads to wealth creation for businesses, shareholders, and employees
- It enables businesses to accumulate capital, which can be reinvested or distributed to shareholders as dividends



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- Employees also often benefit from profit-sharing schemes or performance-based bonuses
- It is essential to recognise that excessive focus on profit maximisation without considering social and environmental factors can lead to negative externalities, such as **environmental degradation**, income inequality, or exploitation of labour
- While profit is a crucial driver of economic activity, it should be pursued within the framework of ethical and sustainable business practices



Your notes



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Technological Change

The Distinction Between Invention & Innovation

- New business ideas can come about through **original ideas or by adapting existing products, services, or ideas**
- **Invention** refers to the creation of entirely **new products** and **processes** that did not exist before.
 - E.g The **printing press** was invented in 15th century and led to the mass production of books
- **Innovation** refers to the development of **existing products, designs or ideas** to improve them or introduce new features
 - E.g The printing press evolved to become more efficient with steam-powered presses and later **digital printing** technology

Technological Change in Production

- Advances in technology can create new opportunities to improve **methods of production, productivity, and efficiency**.
 - These factors all have the potential to decrease a firm's **costs of production**

Advantages of Technological Change on Production

Advantage	Explanation
New methods	<ul style="list-style-type: none"> ▪ Technology has changed the way businesses process or manufacture products. This increases speed of production <ul style="list-style-type: none"> ▪ The use of machines and robotics in car assembly has replaced manual labour ▪ 3D Printers have revolutionised many industries. It is now possible to print both food and houses!
Productivity	<ul style="list-style-type: none"> ▪ Firms experience increased productivity as technologies have the capacity to increase output per unit. This increases marginal revenue and as a result, it maximises profit <ul style="list-style-type: none"> ▪ Amazon uses automated warehouse systems to fill orders, which enables greater output per unit of input



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Efficiency	<ul style="list-style-type: none"> Technologies have created efficiency gains for businesses <ul style="list-style-type: none"> Automated processes reduce waste and allocate resources in most optimal way The adoption of self-checkout systems in supermarkets has led to faster checkout times and increased efficiency
Costs	<ul style="list-style-type: none"> The use of technology has lowered the cost of production as firms benefit from economies of scale more easily <ul style="list-style-type: none"> Automated car assembly lines have increased mass production and reduced production costs per unit

Technological Change Creates New Products & Markets

- The **rapid** evolution of technology has prompted industries to come up with new ideas, products and features to gain consumers and access new markets
- Consumer **tastes and preferences** are also increasingly being influenced by what new technology offers
- Businesses then need to **continuously adapt products and processes** to meet the changing environment
- If they do not adapt, it can mean the **loss** of some businesses or even whole industries
 - E.g There was a fall in demand for traditional **DSLR cameras** or **vinyl records** as consumers preferences were for more modern alternatives. However, these industries have actually experienced a **recent resurgence** as consumer have begun to appreciate the artistic value of these goods

The Impact of Technological Change on Existing Markets and in Creating new Markets

Existing markets	New markets
<ul style="list-style-type: none"> Businesses gain a competitive edge by using technology to create new products and update features to adapt to evolving consumer needs Technology enables the design and development of prototypes and final products 	<ul style="list-style-type: none"> The emergence of smartphones and social media platforms allows businesses to reach new markets through mobile apps and digital marketing <ul style="list-style-type: none"> E.g Uber and uber eats use smart phone and apps to change access

- E.g Recent advancements in **AI** have led to the development of **smart speakers** such as Google Home. They understand voice commands and perform tasks such as playing music, setting reminders, and controlling smart home devices

to transportation and food delivery, reshaping consumer behaviour



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Creative Destruction & Technological Change

- **Creative destruction** is closely linked to **technological change**
 - Technology has led to the **decline of traditional industries**, as innovative products and processes emerge and new industries replace old ones
- Technology **create opportunities** for new business processes, goods and services and **may eliminate existing ones**
 - E.g The rise of **online streaming platforms** (Netflix, Prime, etc) has replaced the less convenient traditional video rental shops. In the past, people used to physically rent videos from a video store, such as Blockbuster. With the introduction of **streaming services**, consumers now have instant access to movies from their own homes

How Does Technological Change Influence Market Structure?

- Technological change has the ability to change some of the characteristics traditionally found in certain **market structures**

Diagram: How Technology Influences Market Structures

Technology can lower barriers to entry and increase the level of competition in an industry



Your notes

Technology can reduce barriers to entry

- Small businesses may be able to **enter markets** that are normally dominated by larger firms
 - E.g. A jewellery maker can set up shop on Etsy and showcase their designs to a **large market**

Technology can reduce information asymmetry

- Web technologies can harness, analyse, interpret and present large amounts of information quickly
 - Information on pricing and products is much more easily available
 - E.g Skyscanner, Google Shopping, and PriceRunner allow consumers to **compare prices and see reviews**

Technology can increase competition

- As more firms can access e-commerce platforms, digital marketing, and online marketplaces, which increases **access to larger markets**
 - E.g Airbnb's online marketplace connects local hosts with customers from around the world

Technology can increase market power

- This can result in the formation of more oligopolies or monopolies
- E.g Technology giants Google and Amazon have gained significant dominance due to factors such as **brand loyalty** and **economies of scale**, making it difficult for smaller competitors to enter the market