

Edexcel A level Economics (A)

Theme 3

Business behaviour and the labour market
2018/19

Course Companion 1/5

Background to
THEORY OF THE FIRM



Student name: _____

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Contents

Spec ref	Topic	Page
3.1.1	Sizes and types of firm	3
3.3.2	Costs	9
3.3.3	Economies and diseconomies of scale	25
3.3.1	Revenue	33
3.3.4	Profit	43
-	Formulae	51

3.1.1 Sizes and types of firms

- a) Reasons why some firms tend to remain small and why others grow **CC3**
- b) Significance of the divorce of ownership from control: the principal-agent problem
- c) Distinction between public and private sector organisations
- d) Distinction between profit and not-for-profit organisations

Public sector organisations

Public sector organisations are owned and controlled by the state

Types of public sector organisation:

- Government departments e.g. Ministry of Justice
- Local authorities e.g. Winchester City Council
- Public corporations e.g. BBC
- Trusts e.g. Hospital trusts such as Hampshire Hospitals
- Regulatory bodies e.g. OFGEM (gas and electricity market regulator)



The main objectives of public sector organisations is to provide a service rather than make a profit.

Private sector organisations (companies/sole traders/partnerships/NFP)

Private sector organisations are those owned by individuals or groups of individuals

The main objective of most is to make a profit.

Some are 'not-for-profit' organisations e.g. charities, sports clubs, religious organisations, Student Loans Company Ltd

COMPANIES

A **private limited company (Ltd)** is financed by shareholders – not obliged to offer shares to general public. Share transfers must be approved by all shareholders. Audited accounts do not need to be made freely available to the general public (on, say, the company website) but they do need to be filed with Companies House and are accessible to interested parties for a fee.

Examples: John Lewis Partnership, Virgin Atlantic. Most are small.

A **public limited company (Plc)** is financed by shareholders – anybody can buy shares. Shares are usually traded on the stock exchange and accounts must be openly published on, say, the company website.

Can you think of any examples?



Identify 5 firms that are operating in Winchester. Which of them would you classify as being relatively small-scale enterprises and which operate on a more national or international basis?

.....
.....
.....
.....
.....

SHAREHOLDERS

- Are the owners of a company
- For a Plc, shares can be bought and sold by the general public, sometimes (but not always) on a recognised stock market, so ownership changes over time
- A majority shareholding (51%) leads to control of the company
- Shareholders have a right to attend an AGM and vote to appoint directors to run the company for them. They also have a right to be consulted about major changes e.g. a merger

The Roles and Duties of Shareholders (Inbrief.co.uk)

What are shareholders?

The shareholders of a company are its financial supporters; they provide finance to a company by purchasing shares in it, and through this become shareholders. This gives them certain rights as shareholders; they also have roles and duties to adhere to, which are set out in the Companies Act 2006. As shareholders of a company, they are *protected from liabilities as the company is 'limited'*. Shareholders may or may not be directors of the company also. Whilst directors are in charge of running the day to day business of the company and making decisions, the shareholders have a few specific roles and duties to ensure they ultimately have control over the company.

Limited liability

If a business owner has "limited liability," it means that he or she is not personally responsible for business debts and obligations of the corporation. In other words, if the corporation is sued, only the assets of the business are at risk, not the owners' (shareholders) personal assets, such as their houses or cars.

Roles of the Shareholders

Major decisions which would have an effect on the shareholders' rights are usually required, through the Companies Act 2006, to be approved by the shareholders at a general meeting called by the directors of the company.

Only certain acts can be done by the shareholders such as removing a director from office or changing the name of the company. In general, shareholders have little power over the directors and how they run the company, but their main role is to attend meeting and discuss whatever is on the agenda to ensure the directors do not go beyond their powers.

Duties of Shareholders

The main duty of shareholders is to pass resolutions at general meetings by voting through their shareholder capacity. This duty is particularly important as it allows the shareholders to exercise their ultimate control over the company and how it is managed.

Power to the owners (Extract from Economist 9.3.2013)

Until recently, the only unpredictable thing about a company annual meeting was what sort of canapés would be served after the “yes” vote. This has started to change. Boards of public firms now lose votes occasionally, though not yet often enough to justify talk of a “shareholder spring”.

About time, too. Shareholders own companies. Managers and directors should serve them. If the owners do not like the way their servants are performing, they have a right to do something about it. Trying to improve the way a firm is run is more constructive than the traditional “Wall Street walk”, whereby disgruntled shareholders simply sell their shares.

One reason why shareholder activism has been increasing is that regulators have encouraged it, especially on pay. For a decade Britain has required firms to give shareholders a non-binding annual vote on executive pay.

Case study

Lloyds faces shareholder revolt as CEO's pay is 95 times that of average worker

António Horta Osório took home a pay package of £6.4m in 2017, up 11% from 2016

Lloyds Banking Group is facing the prospect of a shareholder rebellion after giving its chief executive, António Horta Osório, a pay packet that is nearly 100 times larger than the average worker’s at the bank.

The advisory group Institutional Shareholders Services (ISS) has recommended a vote against the bank’s remuneration report at the annual general meeting on 24 May, highlighting discrepancies between “pay and relative performance”.

It turned attention to an “unduly complex” bonus structure and said there was a “lack of clarity in the company’s public disclosures on how bonus outcomes are actually determined”. Referring to the gap between executive pay and the rest of the bank’s staff, ISS added: “Although pay ratios have not been disclosed, ISS has calculated that the CEO’s pay is 95.0 times that of the average employee in the organisation.”

Horta Osório took home a total pay package of £6.4m in 2017, up 11% from £5.8m in 2016. It came during what Lloyds called a “landmark year” for the bank, having seen bottom-line profits surge 24% to £5.3bn. Lloyds said in a statement it was “surprised” about the ISS recommendation, given that the advisory group backed the new remuneration policy at last year’s annual general meeting, which implemented the pay framework.

“ISS does not challenge the quantum of the awards, which it states are aligned with the group’s strong performance, but raises concerns about the complexity of the framework,” Lloyds said.

“We do not agree with the assertions made within the ISS report as the group makes a high level of disclosure on the framework it operates.”

While ISS backed the policy, it did note some concerns around changes to deferred pay arrangements, which it said resulted in a “higher proportion of the total remuneration package delivered in cash as compared to the previous policy”.

Around 98% of votes cast at the 2017 meeting were in favour of the policy.

Glass Lewis, another shareholder advisory firm, has recommended a vote in favour of the remuneration report. (**Guardian: 18/5/18**)

Separation of ownership from control and the principal agent problem

- ❖ The shareholders are the ‘principals’
- ❖ They appoint directors to run the company on their behalf, as their ‘agent’
- ❖ Directors make the big, strategic decisions
- ❖ Directors appoint managers to run the company on a day to day basis

The likely objective of shareholders is to maximise profit. Reasons:

- Higher profit will mean greater dividends
- Higher profit will lead to a rise in the share price and so increase the capital value of the shares and potential profit from selling the shares

Shareholders may want maximum profit, but will directors and managers also want this? Managers will desire power, large bonuses, prestige and status. They may prefer to aim for maximum sales or maximum revenue for the firm or for growth in market share, in order to gain more prestige.

What is in the best interests of the managers may not necessarily be in the best interests of shareholders.

The directors are appointed to run the company on behalf of shareholders. But:

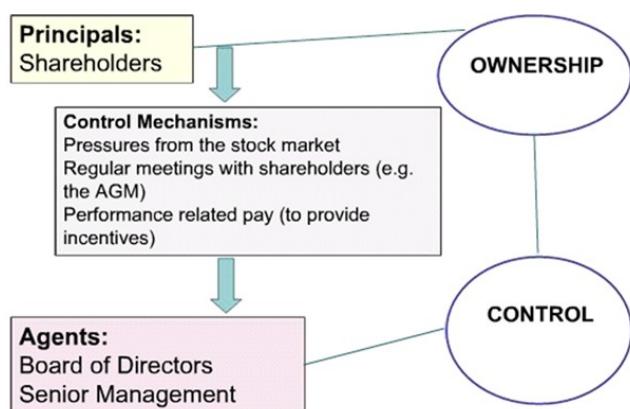
- many shareholders are ‘passive’ and do not even attend the AGM or vote when able to; and
- directors may be unaware of what managers are doing on an operational basis

However, the problem may be lessened as:

- managers will need to aim for profit as it will reflect badly on them if the share price falls and they could lose their job
- managers may receive bonuses linked to profit and may well be shareholders themselves



Question for discussion: To what extent can company shareholders influence decision-making?



Case study:



Apple recently introduced a policy (2013) requiring senior executives at the company to hold three times their annual base salary in shares, and executives have to keep this salary in shares for a minimum of five years to satisfy the requirement



Can you think of any implications of this for Apple?

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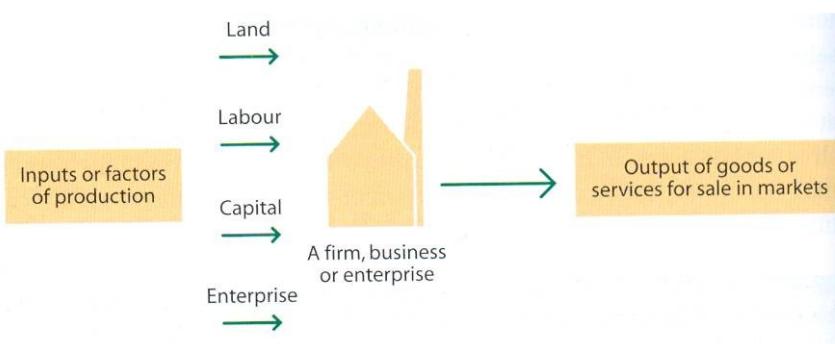
3.3.2 Costs

- a) Formulae to calculate and understand the relationship between:
 - o total cost
 - o total fixed cost
 - o total variable cost
 - o average (total) cost
 - o average fixed cost
 - o average variable cost
 - o marginal cost
- b) Derivation of short-run cost curves from the assumption of diminishing marginal productivity
- c) Relationship between short-run and long-run average cost curves

Production in the short run

In order to understand the behaviour of costs it is important to understand the nature and process of production.

The model below illustrates the production process where inputs are converted into outputs.



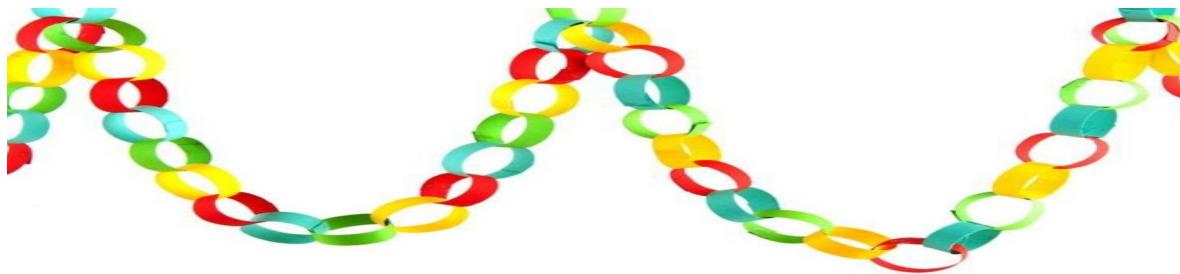
This can also be illustrated in a production function where:

$$\text{Output } (Q) = f(N, L, K)$$

i.e. output is related to the combination of factor inputs of natural resources or 'land' (N), labour (L) and capital (K).

In order to increase output a firm will need to increase its factor inputs. Its ability to do this will depend on the time period in question.

The **short run** is the period over which at least one factor of production is fixed



PAPER CHAIN FACTORY

Resources needed:

- Equipment (fixed capital):
 - One pair of scissors
 - One stapler
 - One ruler
 - One pencil
- A table (fixed land)
- Scrap paper (raw materials)
- Labour (variable resource)

Product to be manufactured: a paper chain

Specification: - quality will be rigorously checked!

- each link must be **4.2cm wide** (one fifth of the width of an A4 sheet) and **30cm long** (entire length)
- links must be in the strict order **red, blue, green, yellow**
- links must be secured with **two staples**

Instructions:

In **three** groups, start with one worker who has **TWO** minutes to make the longest paper chain possible - results (number of links) to be recorded on the board and averaged - post the results below. Then add one more worker to each team - another **TWO** minutes - then a third, a fourth, and so on. What do you notice and why?

CLASS SUMMARY - AGGREGATED RESULTS:

Units of Labor	Total Product	Marginal Product ($\Delta TP/\Delta L$)	Average Product (TP/units of L)
1			
2			
3			
4			
5			
6			
7			



Watch the video clip about production in a small business and [answer the questions which follow:](#)

<http://www.youtube.com/watch?v=FBkfTZikIdU&feature=related>

1. What are the firm's inputs?
2. What is the firm's output?
3. What are the fixed inputs?
4. What are the variable inputs?
5. What is the difference between a fixed and variable input?
6. Explain why it would take time to move to a bigger factory.



Production in the short run: The Law of Diminishing (Marginal) Returns

Law of Diminishing (Marginal) Returns: law stating that, if a firm adds successive units of a variable factor/s (e.g. labour) while holding inputs of at least one other factor fixed (e.g. capital), it will eventually derive diminishing marginal returns from the variable factor/s. In other words the increase in total output will get smaller (or total output may even start to decrease) – i.e. the marginal output falls (and may turn negative).

e.g. as you add more and more workers to a fixed factory space with given machines, eventually the additional output gained from each extra worker will decline.





Watch video clip which returns to the same factory to explain The Law of Diminishing Returns:

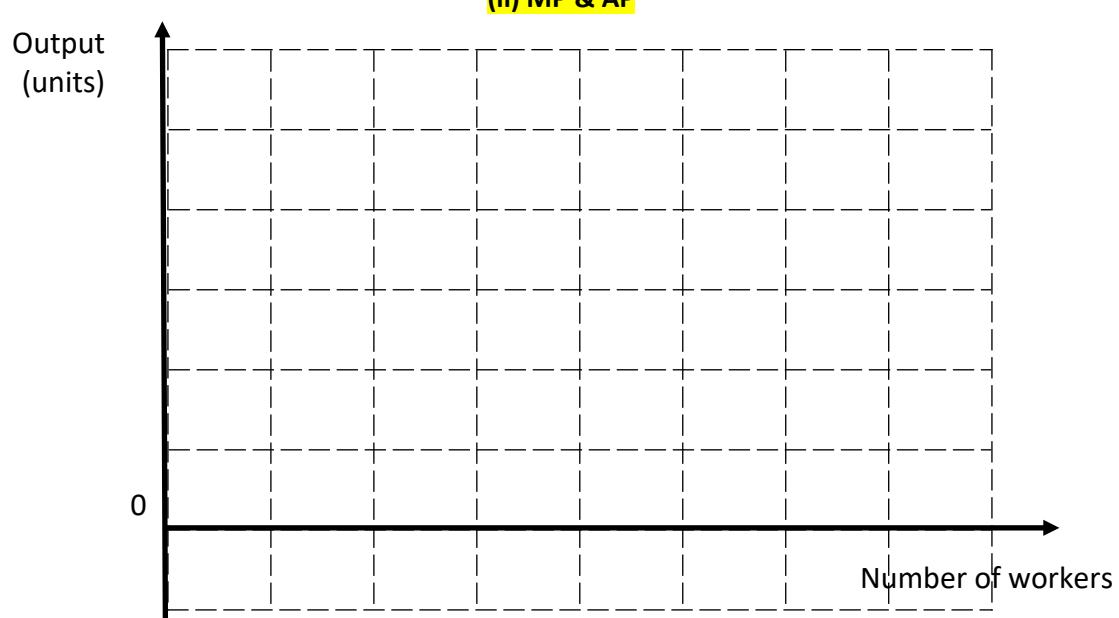
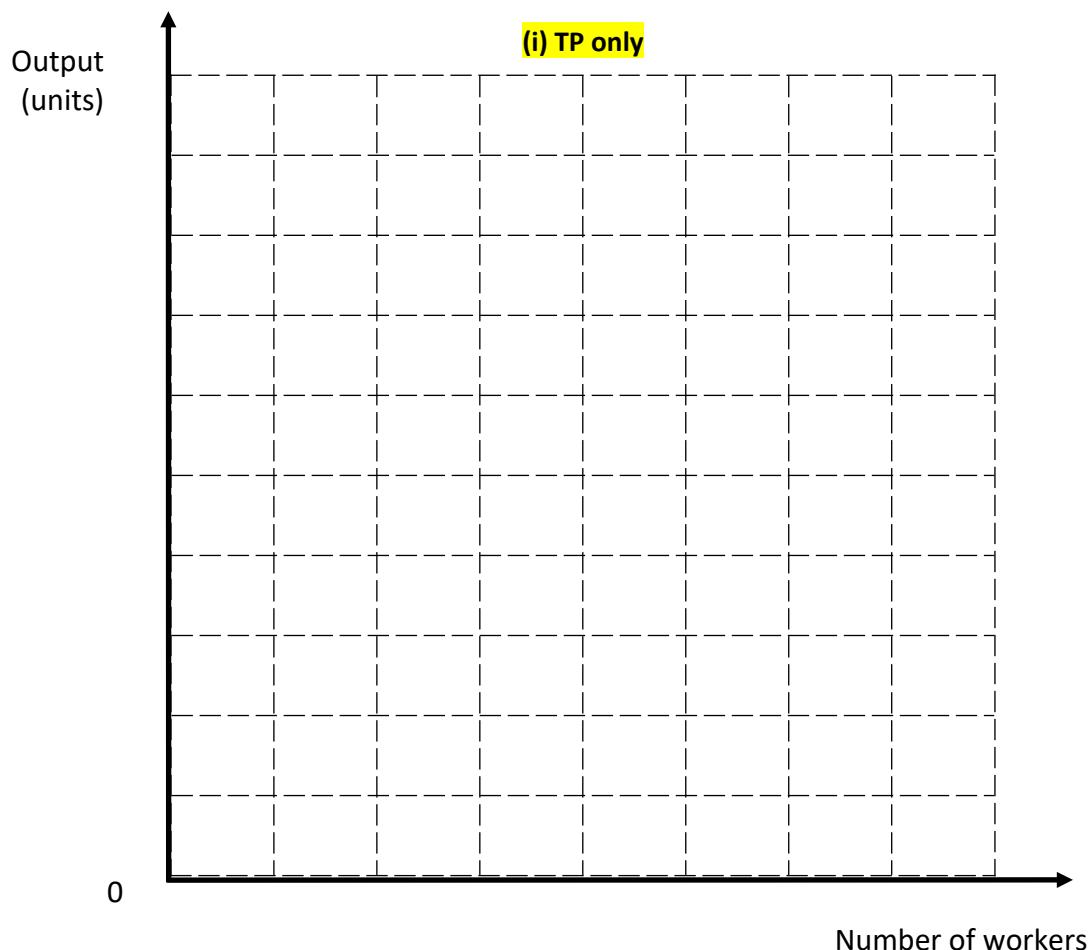
<http://www.youtube.com/watch?v=yrFETnz8wFg>

1. Fill in the table below as you watch the video clip:

Number of workers (Q) <i>(variable input)</i>	Total product (TP)	Marginal product (MP) $TP_n - TP_{n-1}$ or $\Delta TP / \Delta Q$	Average product (AP) TP/Q

2. Explain marginal product
3. Why does the **second worker** add more to output than the first worker?
4. Why does the marginal product fall with the addition of the **fourth worker**?

5. Complete the diagrams below to show (i) TP and (ii) MP and AP



6. In conclusion, what determines the number of workers employed?



The law of diminishing returns

In order to increase output a firm needs to increase the number of inputs.

In the **short run** the firm cannot increase the amount of fixed factors so will need to add more and more units of the variable factors (e.g. labour) to the fixed factors (e.g. capital).

The law states that as more and more units of the variable factor are added, the change in output (Marginal Product) will at first increase and then start to decrease. It is also called the law of variable proportions.

Malthus and the law of diminishing returns

In 1798 the Reverend Thomas Malthus examined the impact of population growth and reached the somewhat gloomy conclusion that population growth would naturally check itself in the form of famine, wars and disease.

He based this view on the idea that populations tended to grow geometrically (assuming couples had two or more children):

2,4,8,16,32,64

while the capacity of land to produce food tended to increase arithmetically (the ability to cultivate more land was less rapid):

2,4,6,8,10,12

The inevitable conclusion for him was that the population growth rate outstripped the capacity of land to provide food for the people, ergo starvation and famine. The theory was based upon what has become known as the law of diminishing returns. www.bized.ac.uk



Malthus argued that land is a fixed input, but the growth of population makes labour a variable input. Malthus proposed a general law of economics, **the Law of Diminishing Returns**: when a fixed input is combined in production with a variable input, using a given technology, increases in the quantity of the variable input will eventually depress the productivity of the variable input. (Malthus argued that decreasing productivity of labour would depress incomes). Was Malthus right? The answer is, of course, yes and no.

There is plenty of evidence, both observational and statistical, that the Law of Diminishing Returns is valid. For example, agricultural economists have carried out experimental tests of the theory. They have selected plots of land of identical size and fertility and used different quantities of fertilizer on the different plots of land. In this example, land was the fixed input and fertilizer the variable input. They found that, as the quantity of fertilizer increased, the productivity of fertilizer declines.

On the other hand, in the two hundred years since Malthus wrote, on the whole, population has increased but labour productivity and incomes have not declined. On the whole, they have risen. What seems to have happened is that technology has improved. Malthus recognized that if technology improved (in agriculture, at least), that might postpone what he saw as the inevitable poverty as a consequence of rising population. Some economists, and other people, believe that the Malthusian prediction will eventually come true. Perhaps: what is clear is that in two hundred years it has not. But that doesn't mean the Law of Diminishing Returns is wrong! A "law" such as this can be true in general but cannot be applied when its assumptions (such as an unchanging technology) aren't true. The "Law" isn't wrong -- just inapplicable to that case.

<http://william-king.www.drexel.edu/top/prin/txt/MPCh/firm6.html>



Questions

1. What did Malthus predict would result from population growth?
2. Why have his predictions not yet come true?
3. Does this prove his theory wrong?

Short run costs: Fixed and variable costs

Fixed (or indirect or overhead) costs: costs which do not vary as the level of production increases or decreases. Example/s?

Variable (or direct or prime) costs: costs which vary directly in proportion to the level of output of a firm. Example/s?

Semi-variable costs: costs that vary with output but not in direct proportion (i.e. they have both a fixed element and a variable element). Example/s?

NB: staff 'wages' generally implies hourly paid (i.e. variable)



Fixed and variable costs for a restaurant

Class work: Imagine you are running a restaurant, what might be your fixed and variable costs?



Fixed costs	Variable costs	Semi-variable costs

Total, average and marginal costs

Total cost (TC): the cost of producing any given level of output.

$$= \text{total variable cost (TVC)} + \text{total fixed cost (TFC)}$$

$$= \text{average total cost (ATC)} \times \text{output (Q)}$$

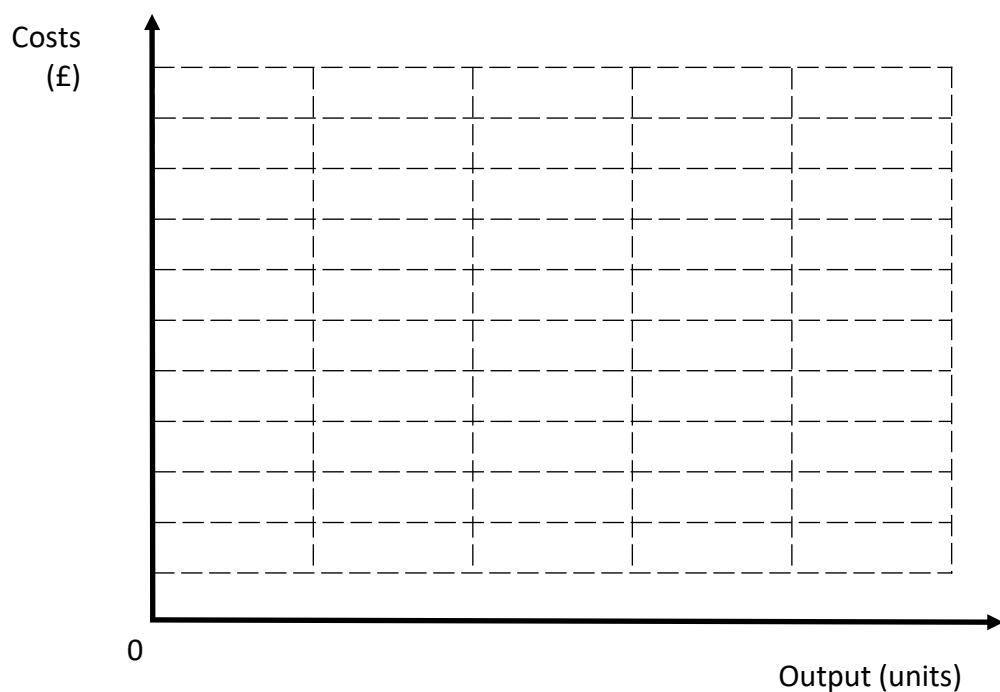


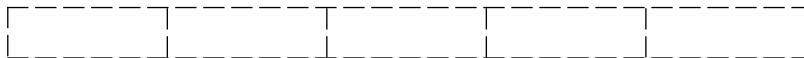
Exercise calculating costs: Complete the table below, calculating the missing figures

Output (per week)	TVC (£)	TFC (£)	TC (£) =TVC+TFC
0	0	200	
1	200		
2	300		
3	600		
4	1,200		
5	2,000		

Q: Why is there a cost of £200 when output is 0?

Now plot all three **cost curves** on the same set of axes:





Average (total) cost: The average cost of production per unit, calculated by dividing the total cost by the quantity produced. It is equal to average variable cost plus average fixed cost.

Average total cost (ATC or simply AC) = $TC/Q = AVC + AFC$ (i.e. total costs spread over total units produced)

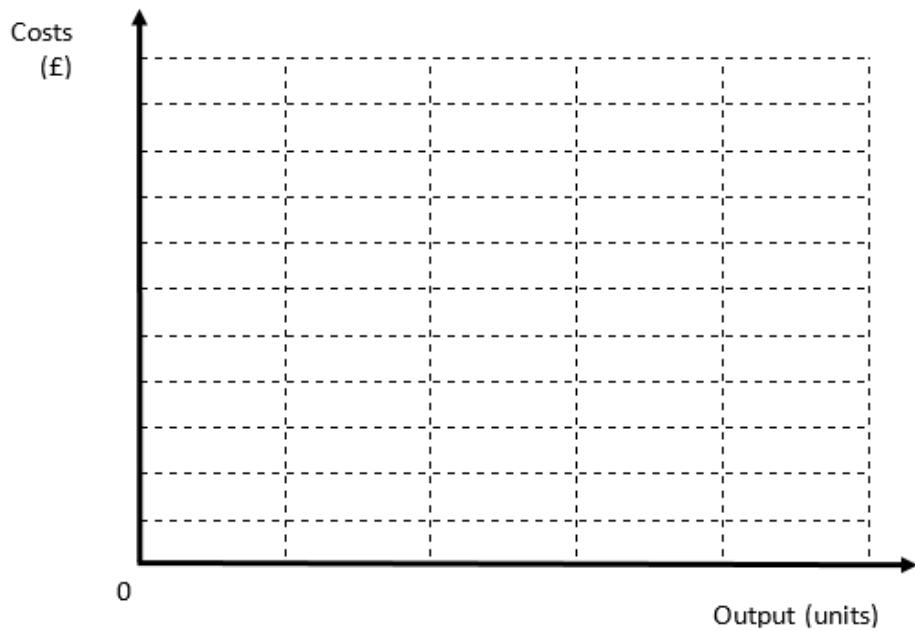
Average variable cost (AVC) = TVC/Q (i.e. variable costs spread over total units produced)

Average fixed cost (AFC) = TFC/Q (i.e. fixed costs spread over total units produced)



Exercise calculating costs: Now revisit the table on p16 and complete the table below:

Output per week (units)	AVC (£)	AFC (£)	ATC (£)
0			
1			
2			
3			
4			
5			



'At the margin'

A fundamental concept in economics as it helps us to understand consumer/firm behaviour given a small change in another variable (e.g. the impact on consumer spending given a small change in income, or the impact on costs of a small change in output). We have already encountered marginal product on p11 as

Marginal cost is the cost of producing an extra unit of output or the change in total cost divided by the change in output

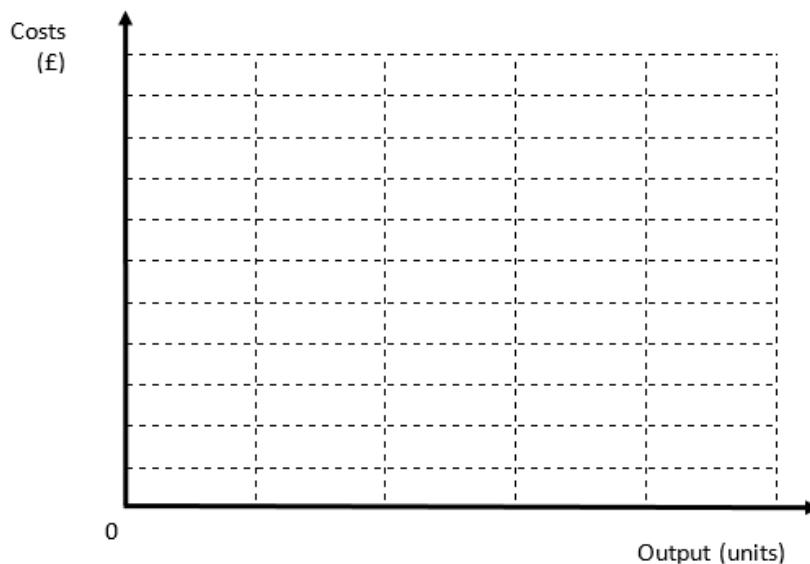
$$MC = \Delta TC / \Delta Q = TC_{n+1} - TC_n$$

e.g. if it cost £100 to produce 10 items and £105 to produce 11 items, then the marginal cost of the 11th item is £5.



Now revisit the table on p16 – complete the table below and plot the values on the grid below:

Output per week (units)	TC (£)	MC (£)
0	200	
1	400	
2	500	
3	800	
4	1400	
5	2200	



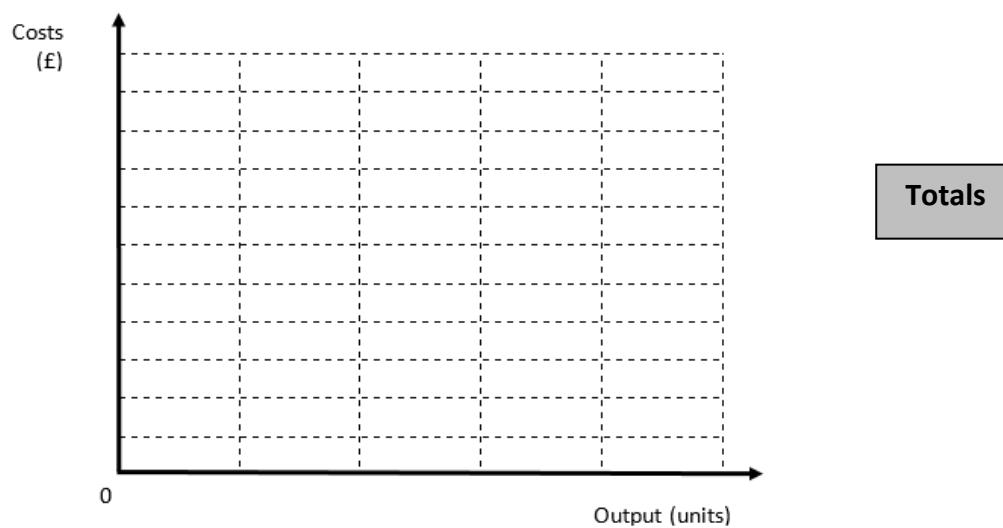
Note:

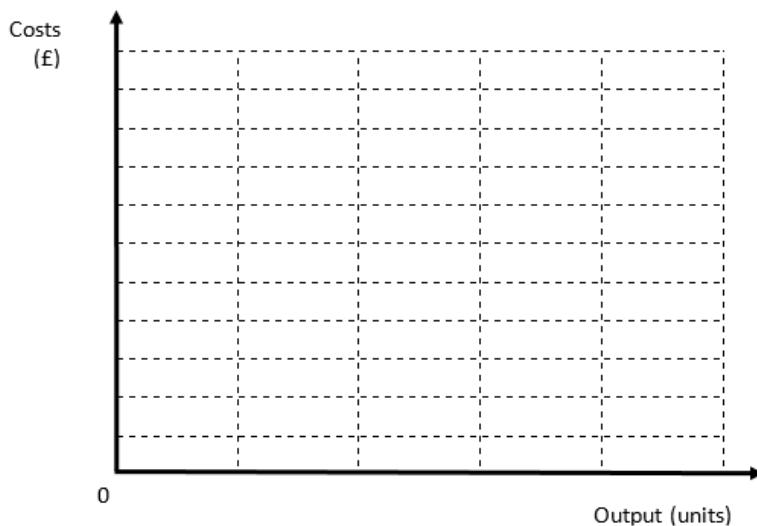
Total cost rises by the amount of variable cost

Marginal cost falls and then rises. This is related to the marginal product. MC rises due to diminishing marginal returns (see p10).

Exercise calculating costs: Complete the table below, calculating the missing figures; then plot the figures on the grid below:

Output (units)	TFC (£)	TVC (£)	TC (£)	AFC (£)	AVC (£)	ATC (£)	MC (£)
0	40						
1		6					
2		11					
3		15					
4			60				
5			66				





Averages, Marginal

Short run costs: The impact of diminishing returns

In the short run it is only possible to increase output by adding more units of the variable factor to the fixed factors. Each successive worker adds less and less output due to the law of diminishing returns. This causes the unit cost of the product to rise as more and more units of the variable factor must be added.

This can be seen from the example in the table below

Capital costs £100 a unit; Labour costs £200 a unit



Complete the table:

Units capital	Units labour	Total output (TP=Q)	Marginal product (MP)	TVC	TFC	TC	AVC	AFC	ATC	MC*
10	0	0								
10	1	20								
10	2	54								
10	3	100								
10	4	151								
10	5	197								

all £

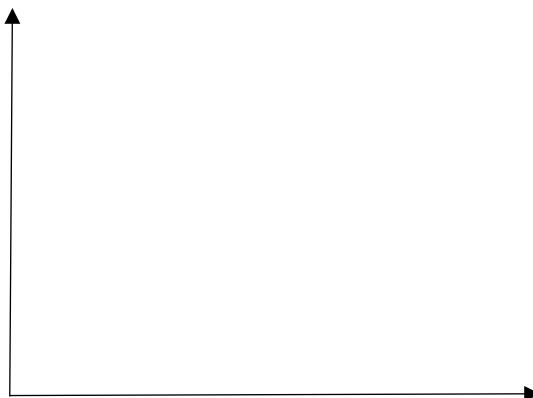
10	6	230							
10	7	251							
10	8	260							

$$*MC = \Delta TC / \Delta Q = (TC_{n+1} - TC_n) / (Q_{n+1} - Q_n) = \text{gradient of } TC = \partial TC / \partial Q$$

Summarising-the shape of the short run cost curves

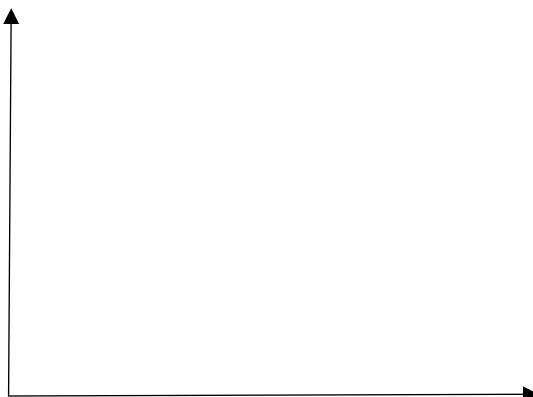
Total costs

- TFC remains unchanged whatever the output level
- At output level 0, $TVC = 0$, so $TC = TFC$



Average & marginal costs

- AFC always falls as output rises as fixed costs are spread over more units of output.
- U-shaped AVC and ATC curves, and hockey stick-shaped MC curve due to law of diminishing returns.
- The lowest point on the MC curve shows where diminishing marginal returns set in.
- The lowest point on the AVC curve shows the point at which diminishing average returns sets in.
- MC curve cuts AVC and ATC curves at their lowest points.
- AVC and ATC get progressively closer together (but never touch) as output increases, since AFC is continually falling (i.e. tends to zero – see above)



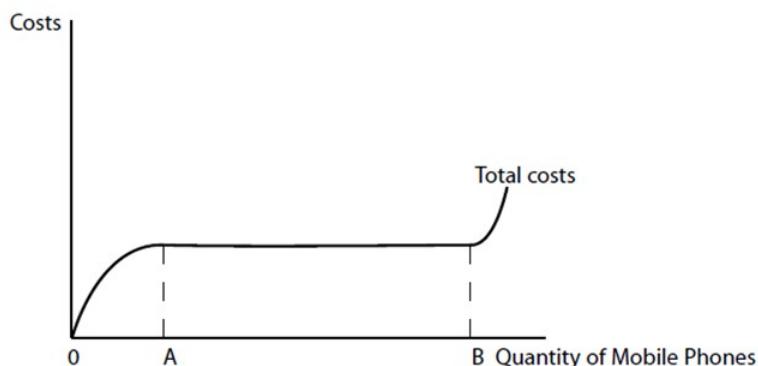
Exercises



(1)

A mobile phone company finds that its total costs are best illustrated by the following curve. What can be deduced about costs over the usual range of output AB?

(1)



- A** Total costs are rising
- B** Marginal costs are zero
- C** Average costs are constant
- D** Average costs are rising
- E** Marginal costs are rising.

Answer

(2)

The table below shows how total output changes as the number of units of labour changes with a fixed quantity of capital. The cost of capital employed is £200. The firm can employ any number of workers at a constant wage rate per unit of labour of £50. Fill in the table:

Units of labour	Total output (units)	TVC (£)	TFC (£)	TC (£)	AVC (£)	AFC (£)	ATC (£)	MC (£)
0	0							
1	20							
2	45							
3	6							
4	7							

- A** a rise in variable costs.

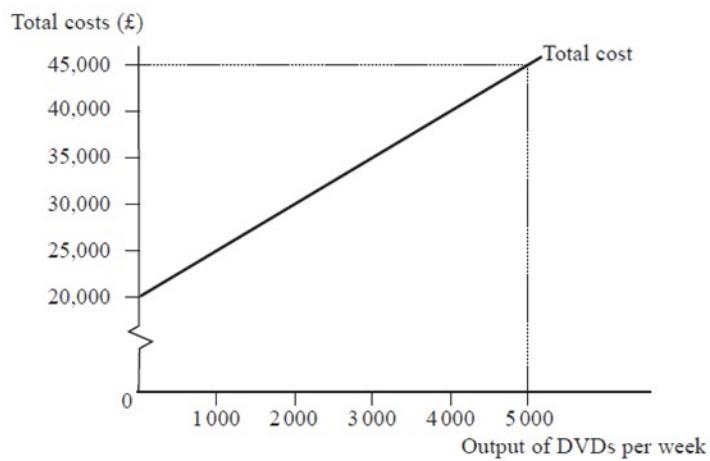
(3)

- B** a rise in fixed costs.
- C** a reduction in revenue.
- D** a fall in marginal costs.
- E** a rise in normal profits.

Answer

(1)

(4)



The diagram shows the total cost function for a company producing DVDs. At an output of 5000 units, average variable cost is

- A £45,000
- B £25,000
- C £9
- D £5
- E £4.

(a) Answer

(1)

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3.3.3 Economies and diseconomies of scale

- a) Types of economies and diseconomies of scale
- b) Minimum efficient scale
- c) Distinction between internal and external economies of scale

Long run costs: **Economies of scale** and long run average cost

The long run is the period of time over which the firm is able to vary the inputs of all its factors of production (except the state of technology which is variable only in the 'very' long run)

There is no standard length of time for the long run, as it varies by industry. Why might it be different for oil refining compared with painting & decorating?

Economies of scale: a fall in the long run average costs of production as output rises.

Optimal level of production: the range of output over which long run average cost is lowest. (i.e. productive efficiency).

Minimum efficient scale of production: the lowest level of output at which long run average cost is minimised.

Constant returns to scale occur when a firm experiences constant long-run average total costs as it expands output.

Diseconomies of scale: a rise in the long run average costs of production as output rises.



Sources of internal economies of scale

Internal economies of scale: a fall in long run average costs of production as output rises **within** a firm, due to advantages **internal** to the firm.

1. **Technical economies of scale:** (these relate to aspects of the production process itself):

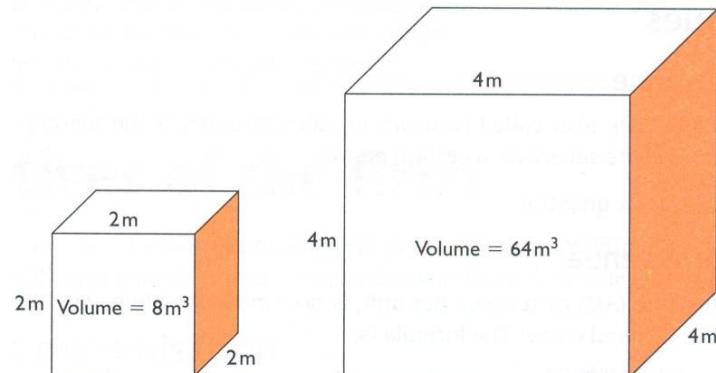
- (a) **Expensive capital inputs:** Large-scale businesses can afford to invest in expensive and specialist machinery. E.g. robotic technology

Mass production using assembly lines in much manufacturing industry leads to technical economies.

- (b) **Specialisation of the workforce**

Larger firms can afford to/are able to employ more specialists who are likely to be more productive leading to cost savings

- (c) **The law of increased dimensions or the “container principle”.** This is linked to the cubic law where doubling the height and width of a tanker or building leads to a more than proportionate increase in the cubic capacity – the application of this law opens up the possibility of scale economies in distribution and transport/freight industries and also in travel and leisure sectors.



For example, an oil tanker (cylinder) doubling the surface area (therefore doubling costs of construction) leads to approximately three fold increase in capacity.

Consider the new generation of super-tankers and the development of enormous passenger aircraft capable of carrying well over 500 passengers on long haul flights. The law of increased dimensions is also important in the energy sectors and in industries such as office rental and warehousing.



Give examples of other applications of the container principle leading to cost reductions:

.....

.....

2. Marketing and purchasing economies of scale:

- (a) Advertising/marketing budget spread over a much greater output
- (b) Bulk purchases

3. Managerial economies of scale:

Specialist managers (division of labour) using specialist equipment e.g. ICT

4. Financial economies of scale:

Larger firms considered more 'credit worthy', therefore banks charge lower interest rates. Larger firms have access to a wide range of possibly cheaper sources of finance, e.g. selling shares on stock market.



Exercises:

(1)

Output (million units)	Long run average cost (£)				
	Firm A	Firm B	Firm C	Firm D	Firm E
1	10	20	16	19	20
2	8	18	14	18	17
3	5	16	15	17	15
4	5	11	17	16	14
5	5	10	20	15	14
6	5	10	24	14	14
7	6	11	30	13	14

For each firm, A to E, give:

- (a) the range of output over which there are:
 - (i) economies of scale; (ii) diseconomies of scale;
- (b) the optimum level or range of output;
- (c) the minimum efficient scale of production.

Orders for New Container Ships

Answers:

EoS

DoS

Optimum

MES

Container capacity (number of containers a ship can carry)	Orders for new container ships
Under 2000	264
2000–3999	520
4000–5999	904
6000+	1485
Total	3173

Source: © Financial Times, 17 December 2004

Firm E

(2)

The table shows orders for new container ships by carrying capacity. It can be inferred from the data that the transport of containers by ship has

A significant economies of scale.

B low start-up costs.

C constant returns to scale.

D increasing marginal costs.

E diseconomies of scale.

(3)

In 2011, the Spanish airline company Iberia merged with the UK airline, British Airways (BA). Iberia's operating costs were higher than those of BA and so there were plenty of opportunities for the new group called International Airlines Group (IAG) to cut these closer to industry norms. However, the merger also gave savings in other areas. For example, significant savings were made by combining all or part of 'back-office' functions such as administration, IT services and support services for planes. At individual airports, one set of staff instead of two could deal with everything apart from desk service. Where BA and Iberia flew the same routes before the merger in competition with each other, flight services could be combined when planes were less than full. Marketing too could be made more cost-effective. The group could save on marketing by advertising BA and Iberia flights together. By directing BA passengers onto Iberia flights where BA did not fly a route also reduces the cost per passenger of a flight. In 2014, IAG raised its full-year profit forecast after reporting a 22 per cent jump in earnings in the 3rd quarter. Partly, the rise in earnings was due to continued cost cutting in its Spanish operations. In December 2014, IAG made a takeover bid for the Irish airline, Aer Lingus, in part hoping that a larger airline would reduce average costs.

Source: adopted from © the *Financial Times*, 7.12.2012, 1.11.2014, 18.12.2014, All Rights Reserved.

What economies of scale might IAG enjoy compared to BA, Iberia and Aer Lingus as independent airlines?

Sources of diseconomies of scale

1. Control – Difficult to monitor productivity & quality of output of thousands of employees.

2. Co-ordination - Difficult to co-ordinate complicated production processes across many factories in different locations & countries, and contracts with hundreds of suppliers.

Achieving efficient flows of information in large businesses is expensive.

3. Co-operation - workers may lack motivation, not feeling important in a big organisation, therefore productivity may fall.

4. Communication difficulties- leading to poor decision-making and higher costs

Avoiding diseconomies of scale

Some economists argue that diseconomies of scale can be avoided with effective management, e.g.

1. Developments in **human resource management (HRM)** e.g. worker recruitment, training, promotion, retention and support of staff.
2. **Performance-related pay schemes (PRP)** can provide appropriate financial incentives for the workforce leading to higher productivity.
3. **Out-sourcing** of manufacturing and distribution can help a business to supply ever-distant markets, reducing costs whilst retaining control over production.

Shifts in the long run average cost curve

External economies of scale: falling average costs of production, shown by a downward shift in the long run average cost curve, which result from a growth in the size of the **industry** within which a firm operates.

Growth of an industry within an area may lead to:

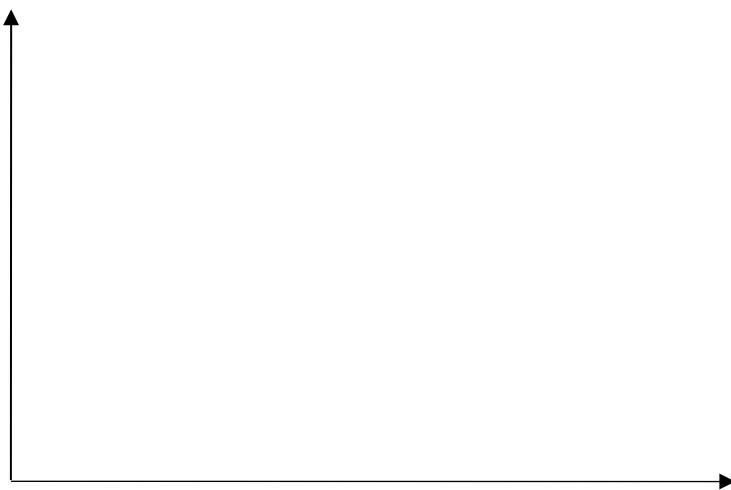
- Better local **transport** network.
- **Lower training costs:** pool of skilled workers, poaching possible, training provided by local colleges.
- **Research and development** facilities in **local universities**
- **Component suppliers** and other support businesses in the area

External economies of scale will **shift the LRAC curve** of an individual firm **downwards**. At a given level of output, its costs will be lower because the industry as a whole has grown.

Taxation: on an industry shift the LRAC curve for each firm upwards.

Technology: LRAC assumes technology is unchanged, in the '**very' long run**' technology may change leading to greater efficiency so LRAC curve shifts downwards.

External diseconomies of scale: shifts LRAC curve upwards, can occur when an industry expands quickly, individual firms compete with each other and bid up prices of factor inputs e.g. wages and raw materials.



*****RESEARCH TASK*****

In small groups, undertake some research on one of the following:

1. Silicon Valley (tech start-ups, California)
2. Silicon Roundabout (tech start-ups, Old Street – E. London)
3. Formula 1 (W. Mids)
4. City of London
5. Silicon Fen (Cambridge biotech)
6. Any others you can come up with!

Please prepare a brief PowerPoint presentation **to deliver in class** to cover issues such as:

- a. History/birth of the region
- b. Impact of the cluster/'hub' on firms (including costs)
- c. Government policy

The relationship between the short run average cost curve and the long run average cost curve

Short run: at least one factor fixed, short run average costs at first fall, and then begin to rise, because of **diminishing returns**.

Long run average costs change because of **economies** and **diseconomies of scale**.

The **long run average cost curve** is an **envelope** of all the **associated short run average cost curves** because the long run average cost is either equal to or below the relevant short run average cost.

There are a series of short run average cost curves shown; each is associated with a different quantity of capital.



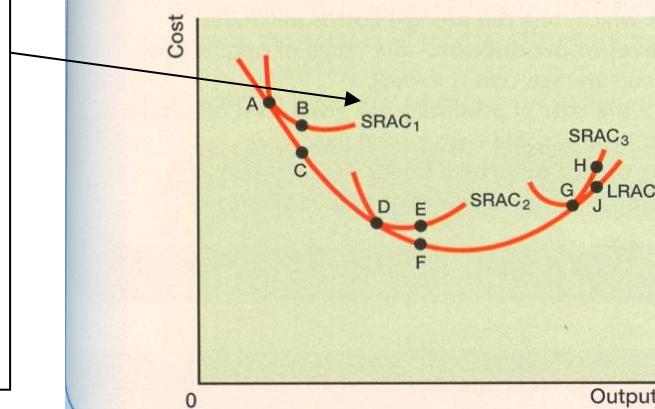
Further reading:

Anderton Unit 44 pages 242 – 251

Note that each SR cost curve touches the LR cost curve at some point.
Each SR cost curve represents a particular plant size.
 $SRAC_1$ represents a smaller plant size than $SRAC_2$ and $SRAC_3$.
The LRAC curve shows the cheapest way of producing any particular output.
The LRAC emerges from drawing an infinite number of short run cost curves.

Figure 5 The long run average cost curve envelope

The long run average cost curve is an envelope for all the associated short run average cost curves because long run average cost is either equal to or below the relevant short run average cost.



Practise drawing this:



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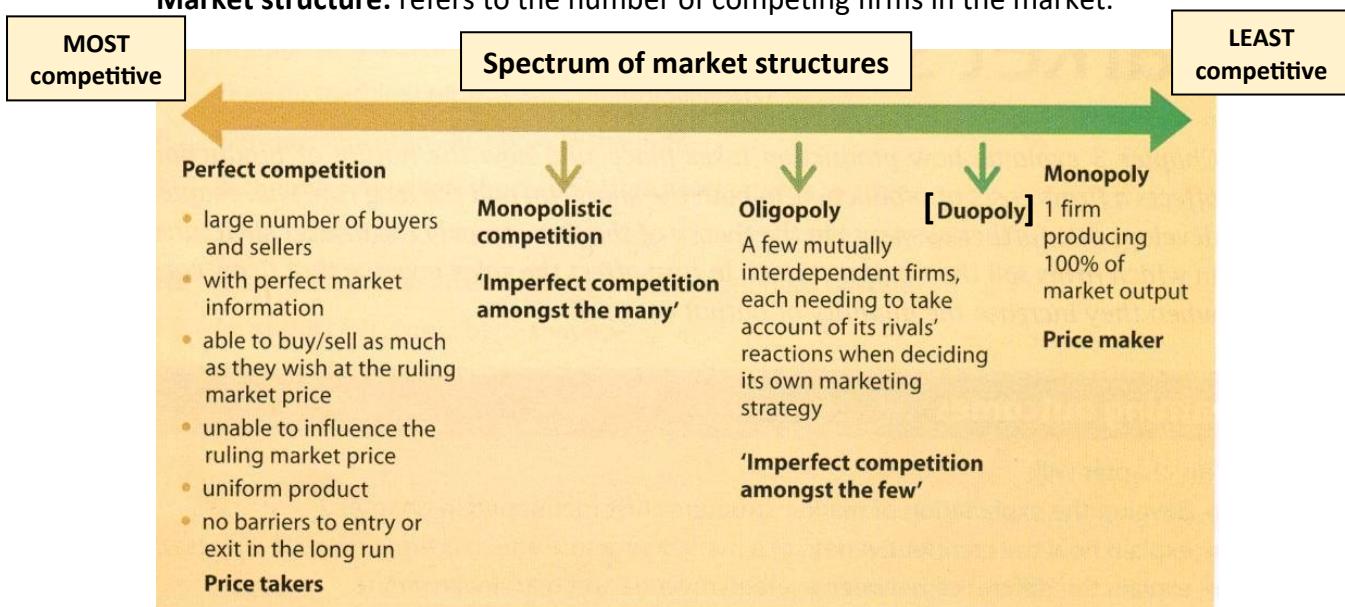
3.3.1 – Revenue

- a) Formulae to calculate and understand the relationship between:
 - o total revenue
 - o average revenue
 - o marginal revenue
- b) Price elasticity of demand and its relationship to revenue concepts (calculation required)

Revenue is the income a firm receives from selling its output.

Impact of market structure on revenue

Market structure: refers to the number of competing firms in the market.



The market structure affects the price & sales revenue when the firm increases the quantity sold.

Total revenue (TR): the total money received from the sale of any given quantity of output.

$$TR = \text{price per unit} \times \text{quantity sold} = PxQ = AR \times Q$$

Average revenue (AR): the average receipts per unit sold (price per unit)

$$AR = TR/Q$$

Marginal revenue (MR): the change in revenue from selling one extra unit of output

$$MR = \Delta TR / \Delta Q = TR_{n+1} - TR_n$$

Price takers and price makers

A **price TAKER** is a firm which has no influence on the market price and must sell all its output at the going market price. *Firms in a perfectly competitive market are price takers.*



Examples of markets/industries where firms have no price setting power:

-
-
-

A **price MAKER** is a firm which is able to select the price at which it sells its output. It will generally sell more at a lower price. There are differing degrees of price-setting power. A monopolist has the most power to set price as it is the only firm in the market. In oligopoly and monopolistic competition firms have *less* price-setting power but can still raise their price without losing all their customers.



Examples of firms which have price setting power:

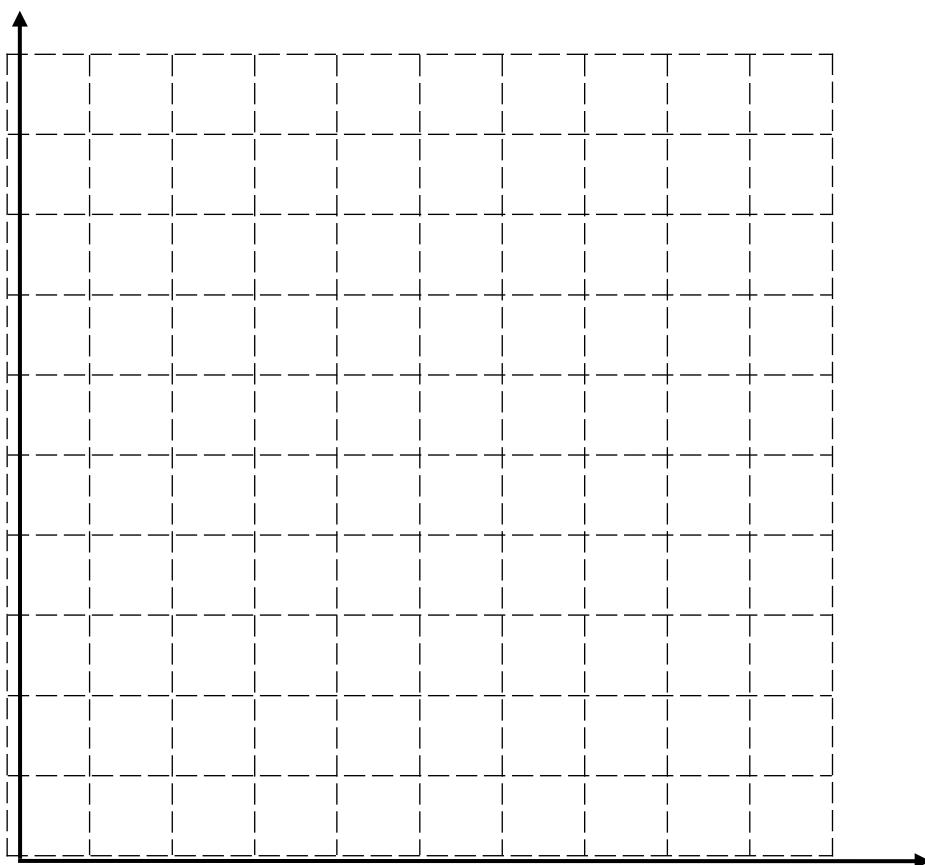
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Classwork exercise 1: Calculating average revenue and marginal revenue for price TAKERS:

Sales	TR (£)	AR (£)	MR (£)
0	0		
1	5		
2	10		
3	15		
4	20		
5	25		
6	30		
7	35		
8	40		
9	45		
10	50		

Plot TR, AR and MR curve for price takers below:



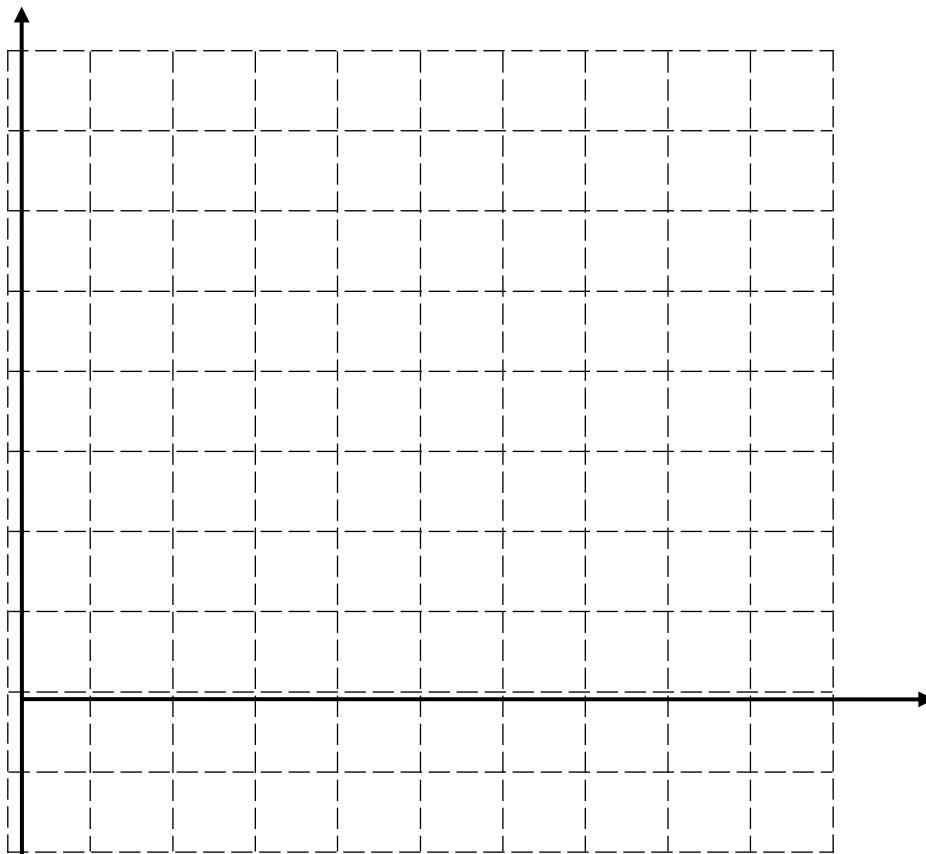
Q: What PED does the individual firm face and why?



Classwork exercise 2: Calculating total revenue and marginal revenue for price **MAKERS**:

Quantity sold	AR (£)	TR (£)	MR (£)
1	20		
2	18		
3	16		
4	14		
5	12		
6	10		
7	8		
8	6		
9	4		
10	2		

Plot TR, AR and MR curves from above table on the graph paper below:



Q: At what level of output does the firm maximise total revenue?

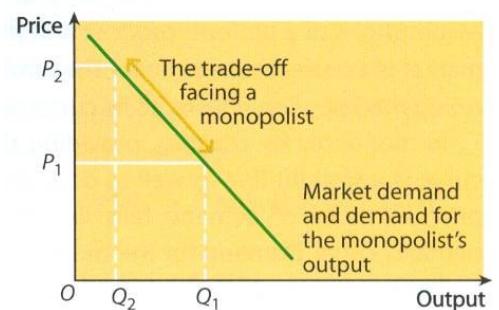
What is the revenue maximisation condition?

Revenue curves for price maker (imperfect competition/monopoly)

- Monopolist *is* the industry, so faces a downward sloping market demand curve, PED determined by nature of consumer demand for product.
- Where firm is **price maker**, the demand curve dictates maximum amount that can be sold at each price, therefore monopolist faces **trade-off** between **price** and **quantity sold**.



Royal Mail



Points to note:

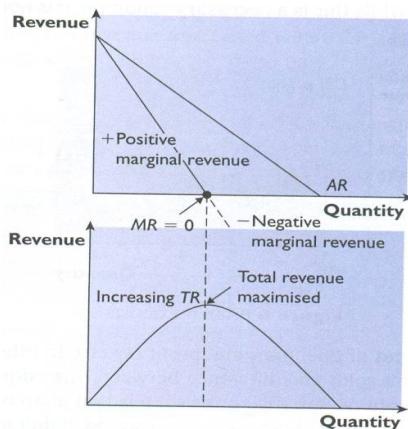
- Total revenue (TR) first rises then falls
- Average revenue (AR) downward sloping
- Marginal revenue (MR) downward sloping and below AR.....

Why is MR curve downward sloping and below AR curve?

Because the firm must reduce its price in order to sell more units – if the firm wants to sell Q_1 units rather than Q_2 units it must reduce the price of all units sold, including all those it would have sold previously at price P_2 .

.....and twice as steep as AR (see overleaf)

- Total revenue maximised when $MR = 0$, because to the left of this point MR positive (increasing total revenue), and to the right MR negative (decreasing total revenue).
- This diagram is often rewarded on supported multi-choice: if TR curve shown then draw MR/AR curves to complete diagram.



Sales	Average revenue £	Total Revenue £	Marginal Revenue £
1	30	30	24
2	27	54	18
3	24	72	12
4	21	84	6
5	18	90	0
6	15	90	-6
7	12	84	-12
8	9	72	-18
9	6	54	-24
10	3	30	

EXTENSION ACTIVITY:**The mathematical relationship between AR and MR**

The formula for a straight line demand curve is

$$P = a - bQ \quad (\text{where } b \text{ is the gradient and is negative as it slopes down})$$

$$TR = P \times Q$$

$$= Q(a - bQ)$$

$$= aQ - bQ^2$$

$$MR = \frac{\Delta TR}{\Delta Q} \quad \text{OR} \quad \frac{dTR}{dQ} \quad (\text{differentiating the TR function})$$

$$= a - 2bQ$$

QED.....the MR is twice as steep as the AR (demand) curve.



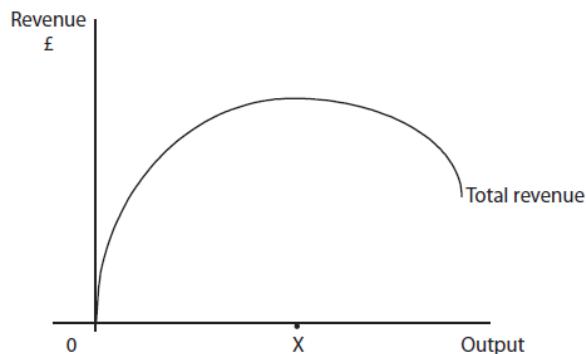


Further reading: Anderton 6th edition – unit 42



Revenue – multiple choice examples:

(1)



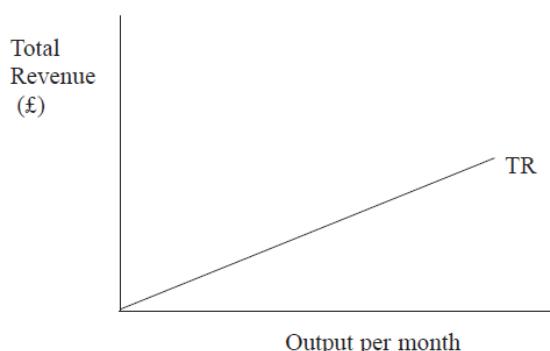
The diagram shows the total revenue curve of a firm. It can be deduced that:

(1)

- A average revenue and marginal revenue will be upward sloping as output increases
- B average revenue will be equal to marginal revenue as output increases
- C average cost will be falling as output increases
- D the firm will be making maximum profit at output OX
- E average revenue and marginal revenue will both be falling as output increases.

Answer

(2)



The diagram shows a firm's total revenue as output increases.
Which of the following best characterises such a firm?

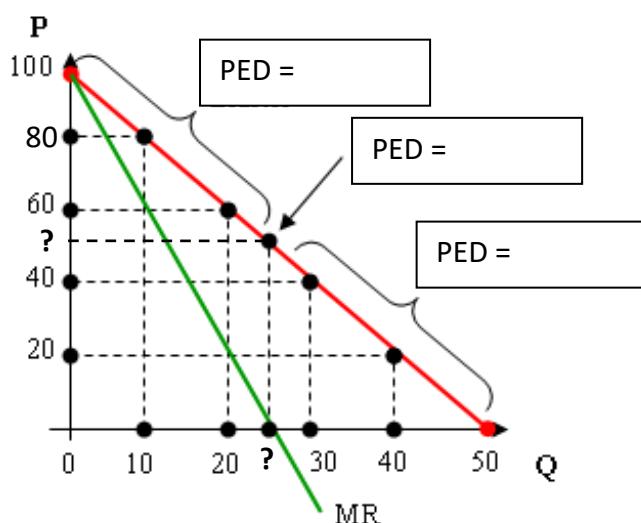
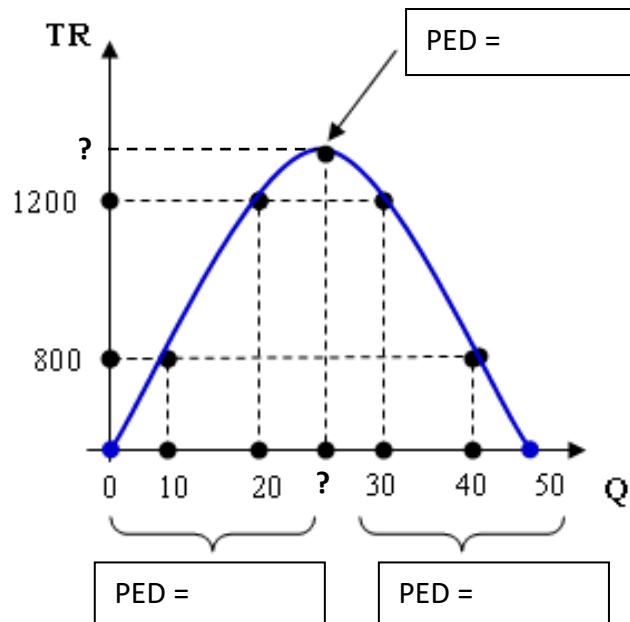
	Average Revenue	Marginal Revenue
A	Constant	Constant
B	Rising	Rising
C	Rising	Constant
D	Constant	Rising
E	Falling	Falling

Answer

(1)

Explanation

Price maker revenue curves and PED models



To Do:

- (1) At what level of output is $MR=0$?
- (2) Calculate PED as price falls from 80 to 60 – what happens to TR as price is dropped over this range?
- (3) Calculate PED as price falls from 40 to 20 – what happens to TR as price is dropped over this range?
- (4) What is the value of PED when $P=100$?
- (5) What is the value of PED when $P=0$?
.....summarise your findings overleaf.

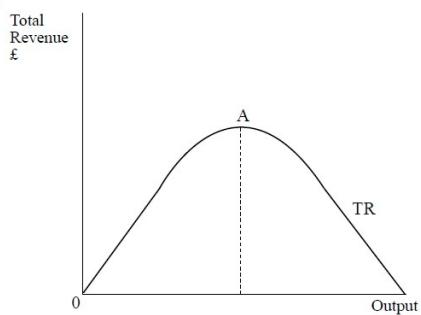


What happens to total revenue in the following situations?

WHAT IF.....	IMPACT ON Q_D & REVENUE
PED is elastic (>1) and a firm <u>lowers</u> its price	
Conversely, PED is elastic (>1) and a firm <u>raises</u> its price	
PED is inelastic (<1) and a firm <u>lowers</u> its price	
Conversely, PED is inelastic (<1) and a firm <u>raises</u> its price	
PED is unit elastic ($=1$) and a firm <u>raises/lowers</u> its price	
PED is (-)4.0 (elastic) and the firm <u>lowers</u> its price by 15%	
PED is (-)1.5 (elastic) and the firm <u>raises</u> its price by 4%	
PED is (-)0.2 (inelastic) and the firm <u>lowers</u> its price by 20%	
PED is (-)0.4 (inelastic) and the firm <u>raises</u> its price by 30%	



PED multiple choice example:



A pizza delivery company operating at point A must necessarily be operating where

- A** $MC = MR$
- B** $AC = AR$
- C** $MR = 0$
- D** $P = MC$
- E** it is productively efficient

(a) Answer

(1)

(b) Explanation



Further reading: Anderton Unit 44

3.3.4 – Normal profits, supernormal profits and losses

- a) Condition for profit maximisation
- b) Normal profit, supernormal profit and losses
- c) Short-run and long-run shut-down points: diagrammatic analysis

Profit = total revenue – total cost

Normal and supernormal profit

Normal profit: is the minimum profit a firm must make to stay in business, whilst being insufficient to attract new firms into the market. It is also the profit that the firm could make by using its resources in their next best use.

Economists treat normal profit as a **cost of production** i.e. included in total cost (Economic Cost = Financial Cost + Opportunity Cost) so normal profit earned where: Total Revenue = Total Cost (sometimes referred to as 'break-even') or $AR=AC \Rightarrow$ equilibrium (no tendency to change – *firms will neither join nor leave*)

*NB: $AR=AC$ is also known as **sales (volume) maximisation** – the greatest quantity a (rational) firm is prepared to produce without making a loss.*

Losses (or subnormal profits) occur when Total Costs are greater than Total Revenue ($TC>TR$ or $AC>AR$) \Rightarrow *firms will leave the industry* for the next best alternative (subject to barriers to exit).

Supernormal (or abnormal or economic) profit: is profit over and above normal profit. Supernormal profit if: Total Revenue > Total Cost (or $AR>AC$) \Rightarrow *firms will join the industry* from the next best alternative (subject to barriers to entry)



Profits/losses – practice questions:

(1)

Question 1

A business woman runs her own business. Over the past twelve months, she has paid £18 000 for materials and £9 000 in wages to a worker whom she employs. She runs the business from premises which her parents own. These premises could be rented out for £10 000 a year if she were not occupying them. She has £40 000 worth of her own capital tied up in the business. She is a trained teacher and at present works exactly half of her time in a school earning £15 000. She could work full time as a teacher (earning £30 000 a year) if she didn't run the business. The current rate of interest is 5 per cent. The total revenue of her business over the past 12 months was £60 000.

...by her...



- (a) On the basis of these figures, what were the costs she actually paid out and what were her economic costs?
- (b) Did she make a profit last year?

Answers to Q1:

(a)

(b)

(2) Break-even point: the level/s of output where total revenue equals total cost (i.e. normal profits are made)

Class work: Studying table 1, at what output does the firm:

- (a) break even
- (b) maximise profit

Table 1

Output	Total revenue (£)	Total cost (£)	Profit (£)
1	25	35	-10
2	50	61	-11
3	75	75	0
4	100	90	10
5	125	106	19
6	150	123	27
7	175	148	27
8	200	182	18
9	225	229	-4



Profit maximisation

Class revision: Define the terms:

Marginal cost (MC) =

Marginal revenue (MR) =

Class work: Calculating the profit maximising level of output (price taker)

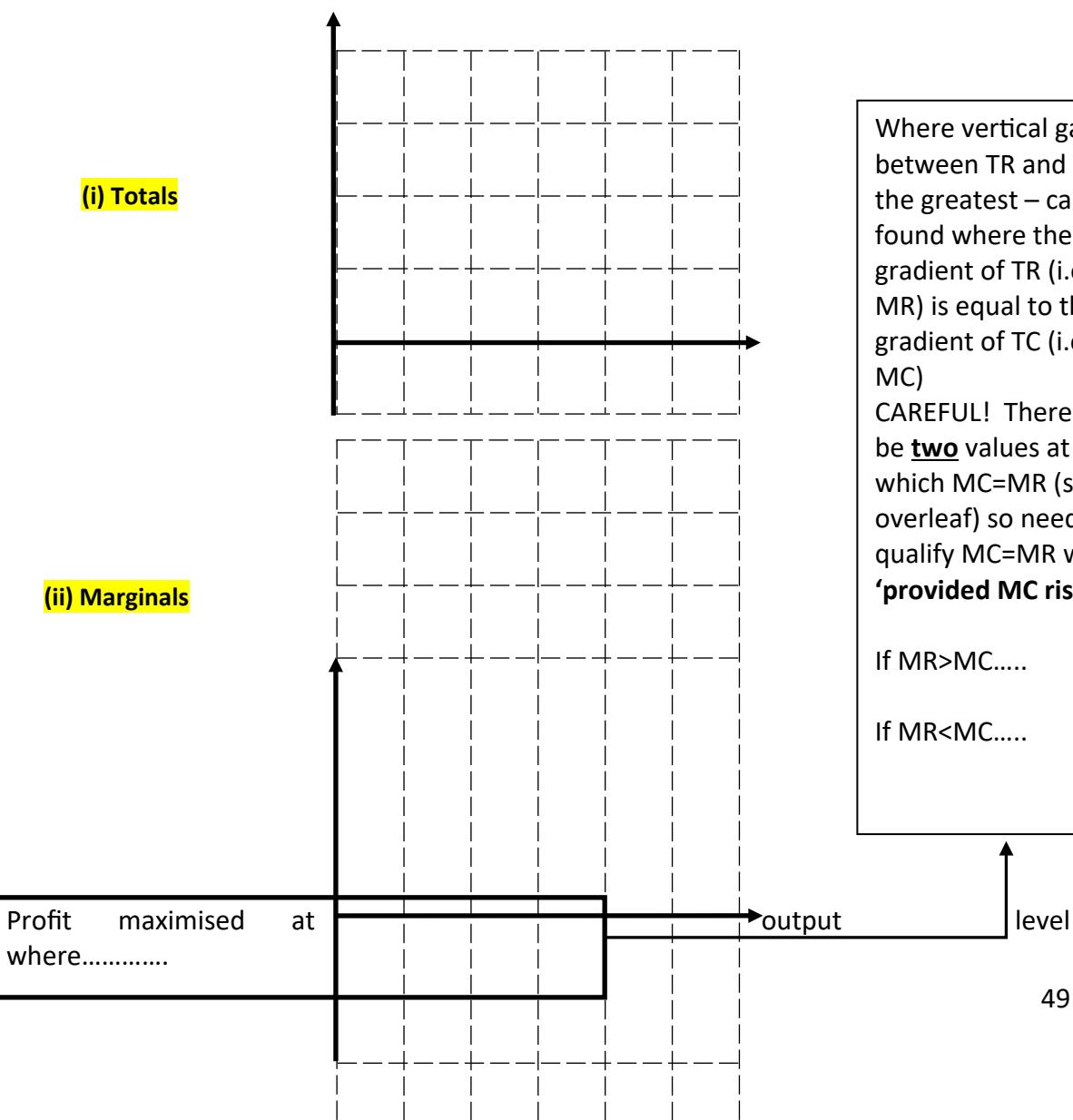
(a) Complete the table below.

Output	TR (£)	TC (£)	Total profit (£)	MR (£)	MC (£)	Marginal profit i.e. addition to total profit (MR-MC)
1	10	8				
2	20	14				
3	30	20				
4	40	30				
5	50	50				
6	60	80				

(b) Identify the profit maximising level of output.

(c) Using the data, explain why $MC = MR$ at the profit maximising level of output.

(d) Plot on graph paper below (use the same scale on the output/x-axis)





MC = MR and MC rising (explanation to follow)

Showing profit maximisation on diagrams

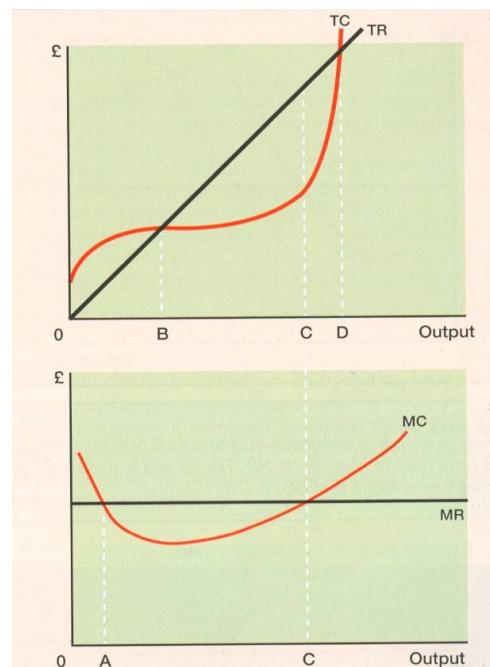
Class discussion: Study the diagram:

- (a) Revenue revision: Is the firm a price maker or price taker?

At which output levels does the firm:

- (b) Break even

- (c) Maximise profit



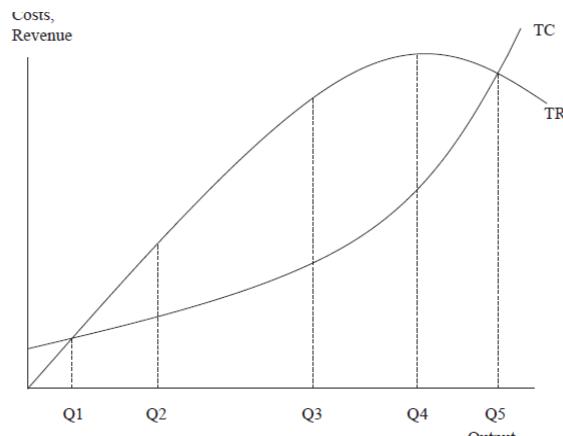
Class discussion: Study the diagram:

- (d) Revenue revision: Is the firm a price maker or price taker?

At which output levels does the firm:

- (e) Break even

- (f) Maximise profit



Multiple choice example

In December 2009 the Royal Mail announced that it had made a 4% increase in profits compared to 2008, despite a fall of 3 million items a day in the amount of post being sent. The most likely reason for the increase in profits was

(1)

- A an increase in contestability in the postal market
- B a fall in the real price of postage stamps
- C a rise in nominal wages of postal workers
- D a fall in employment in the Royal Mail
- E external diseconomies of scale in the postal industry.

Answer



Further reading:
Anderton 6th edition Unit 44



Profit maximisation exercise

Remember!!! Profit Maximisation output rule: **MC = MR**

Output (Q)	TR	TC	Profit (TR – TC)	MR	MC	Marginal profit (MR – MC)
1	25	35				
2	50	61				
3	75	75				
4	100	90				
5	125	106				
6	150	123				
7	175	148				
8	200	182				
9	225	229				

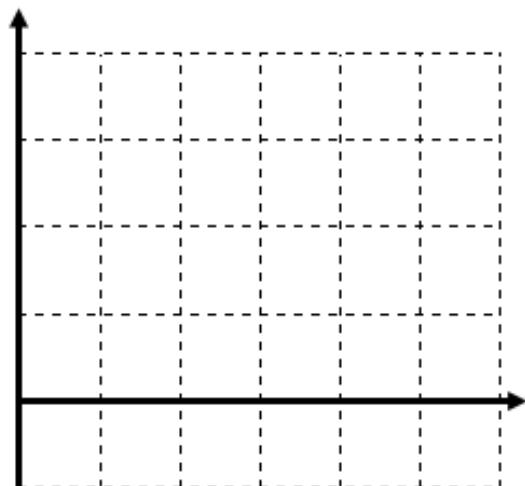
1. Calculate the profit, MC, and MR

2. Plot on two graphs one above the other:

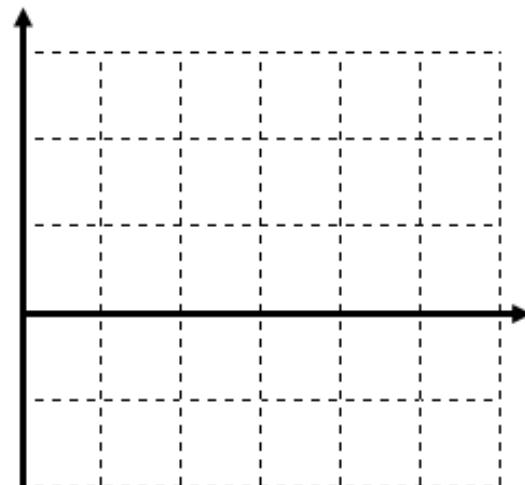
- TC and TR
- MC and MR

3. Identify the profit maximisation point $MC = MR$ on your graph

(i) Totals



(ii) Marginals



Profit Maximisation and marginal profit

So long as the firm can make additional profit by producing an extra unit of output, it will carry on expanding production. But it will stop extra production when the extra unit yields a loss (i.e. where marginal profit moves from positive to negative). In the above example this happens at an output of 7 units. The 7th unit contributes nothing to abnormal profit. However, cost includes an allowance for normal profit and therefore, the firm will actually produce the seventh unit. The 8th unit yields a loss of profit of £9. The firm will therefore, not produce the 8th unit if it wishes to maximise profits.

The functions of profit

- Profit is the return to the entrepreneur for risk-taking. It is the main reason for business start-ups.
- Profit is necessary in a limited company to pay out dividends to shareholders to encourage them to hold shares. A lack of profit or a fall in profit will cause shareholders to sell their shares. This will cause a fall in the share price and a fall in the capital value of the business.
- A lack of profit may lead to takeover of a business, especially if its share price falls and shares becomes 'cheap' or it could cause company failure
- A measure of the success of business and a way of comparing the success of different businesses
- Retained profit is main source of investment by companies
- Profit acts as a market signal – it provides incentive for new firms to enter an industry
- Tax on company profits (corporation tax) is a source of revenue for the government (approx. 8% of total tax receipts in 2015 – Source: OECD)

Facebook shares dip after FBI probes

Cambridge Analytica controversy (Telegraph, 3/7/18)

Facebook shares fell on Tuesday after it emerged that the Federal Bureau of Investigation has opened an investigation into whether the social network hid details of the Cambridge Analytica data harvesting scandal from the public.

Almost \$12bn (£9.1bn) was wiped from the social network's value on Tuesday, a 2pc share price fall, after it emerged that several government agencies had joined an investigation into the company.

Officials will examine how it was possible for 71m American users to have their personal information mined and handed over to a political consultancy that included Republican candidates and president-to-be Donald Trump among its clients.

Mulberry shares collapse on £3m House of

Fraser hit (BBC, 20/8/18)

Shares in luxury handbag maker Mulberry plunged 30% after it said it was setting aside £3m to cover the cost of House of Fraser's troubles.

The company also warned full-year profits could be "materially reduced" if current tough UK trading continued into the second half of the year.

Mulberry operates 21 House of Fraser concessions, employing 88 people.

It was owed about £2.4m when the department store collapsed and fell into administration.

House of Fraser was then bought by Sports Direct, but its owner, Mike Ashley, has said he will not pay creditors for debts incurred before the takeover.

Mr Ashley says he intends to turn it into the "Harrods of the High Street", but it is not clear how many of the stores he will keep on.

 Explain why Facebook and Mulberry profits have fallen



Microeconomic and macroeconomic effects of falling company profits

Microeconomic effects	Macroeconomic effects



List of Formulae – self-study exercise

Concept	Formula	Explanation
Total Product (TP)		
Average Product (AP)		
Marginal Product (MP)		
Total Cost (TC)		
Average Cost (AC)		
Marginal Cost (MC)		
Total Fixed Cost (TFC)		
Total Variable Cost (TVC)		
Average Fixed Cost (AFC)		
Average Variable Cost (AVC)		
Total Revenue (TR)		
Average Revenue (AR)		
Marginal Revenue (MR)		
Total profit		
Normal profit		
Supernormal (abnormal) profit		
Profit maximisation		
Subnormal profit/Loss		
Sales maximisation		
Revenue maximisation		
Price taker/perfectly elastic demand		
Price maker/monopoly		
Break-even		