The big picture

Real-world issue 2: When are markets unable to satisfy important economic objectives – and does government intervention help?

So far in this topic, we have looked at the extent to which the free market is efficient. We have found that two conditions create some inefficiency: government intervention and the existence of costs or benefits that are external to the transaction between buyer and seller. All examples of market failure create external costs or benefits in some way. Public goods are merit goods; the overuse of common pool resources causes social costs to be higher than private costs, and so does asymmetric information.

We have also seen that different markets don't all look and behave in the same way. Often it is because of the sensitivity of participants to changes in income or prices. There is one final determinant of efficiency in markets that we need to look at, and that is the number of firms participating in a market.

Figure 1. The aim of the game Monopoly is to become the dominant player.

You will probably have heard of, or even played, the game called Monopoly. In the game, your aim is to become the sole owner of all the spaces on the board. When you reach that point, you have sufficient control to set rents higher and push the other participants out of the competition.

Source: "Microsoft Headquarters (https://commons.wikimedia.org/wiki/File:Building92microsoft.jpg)" by Coolcaesar is licensed under CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0/deed.en)

Figure 2. Microsoft has had control over operating systems and office software since the 1980s.

In real-life markets, the idea is exactly the same (although playing Monopoly in class will probably not help you much with this subtopic). Large and dominant firms have the ability to set prices above an efficient point, and produce less than the socially optimal level. A monopoly is a form of market failure. The addition of more firms will improve the outcomes of the market, but there are also some situations where we might want a particular firm to have a little more power.

Microsoft has dominated the computer operating system and office software markets since the 1980s. It retains that dominance for a few reasons. Today, the company is so large that it would be difficult for new entrants to pose a threat. In addition, the fact that most companies use Microsoft Office programs to run their businesses means that exchange between firms is easy. Documents and spreadsheets can be easily shared between companies and their suppliers and clients. Apple and Google have started to infiltrate this market, but the biggest firms will still find it difficult to manage any switch over – just imagine all the processes that would be involved.

This subtopic will start with a short introduction to market structures, before developing some fundamental theory on costs, revenues and profits that you will need for a more in-depth analysis of market structures. There are four market structures that you will learn about:

- Monopoly
- Oligopoly
- Monopolistic competition
- Perfect competition

Overview (/study/ap 186- cid- 754025/

Concept

Efficiency
Interdependence

We have often been suspicious of business ambitions throughout history, and scholars have sought to understand whether what motivates businesses can result in outcomes that align with consumers' and societies' needs. The number of firms that operate in a market strongly determines the efficient allocation of resources. The number of firms also determines what kind of dynamic exists between firms and how interdependent they are. More competition gives consumers more choice and promotes efficiency because the higher number of firms operating are rivals for each other. Even when there are fewer firms, they are still interdependent on each other for their gains in market share, which can also improve market outcomes. Markets with only a few firms do face relatively less competition, though, and governments need to be wary.

How happy are you when the products you buy are produced by businesses with little or no competition?

Would you prefer many smaller firms, or fewer large firms? Under what circumstances might it be OK to have fewer firms operating?

Types of competitive markets

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Monopoly

A monopoly is when just a single firm is operating in the entire market. It is the result of strong barriers to entry and exit. Barriers can include the firm enjoying economies of scale, with new firms struggling to compete due to large start-up costs. Consumers may also be very brand loyal, creating problems for any potential new entrants. Monopoly firms can exhibit predatory behaviour.

Student view

Figure 1. An aerial view of a water treatment facility. Because of the infrastructure required, utilities companies such as water companies are natural monopolies.

However, not all barriers are firm-created. For example, there could be legal protections created by the government, such as patents. This means that a monopoly does not have the fierce competition and dynamism of perfect competition. Another situation in which a monopoly might arise naturally is where there are large infrastructure investments required, such as rail and communication networks.

Oligopoly

An oligopoly is a market structure in which only a few firms operate. Most countries will have several examples of these, because there are certain industries that tend to be oligopolies. These include supermarkets, energy suppliers, mobile phone companies, telecommunications and internet providers.

These firms are so large that it results in fierce competition among them, even though the market as a whole is not very competitive. Loss of sales from one firm will see direct gains for one of the other few firms.

Firms in oligopolies find it very difficult to compete with each other on prices. For example, supermarkets will struggle to charge wildly different prices compared to their competitors for things like milk and bread, and all the branded products sold that are common between them. As a result, these firms will engage in non-price competition by promoting their brands through such things as advertising and loyalty cards.

Monopolistic competition

Figure 2. Shoes and clothing is a good example of monopolistic competition because of the branding that is present.

Credit: Getty Images Larry Washburn

Monopolistic competition is the most competitive and the most common market structure. There are many firms in this market structure, each with a relatively small size compared to the size of the market. They sell similar goods, but the goods are not identical. Branding is what commonly sets firms apart from each other. Each firm has some market power but not a significant amount. They will rely heavily on advertising their brand to attract consumers.

Be aware

Students often confuse monopoly with monopolistic competition. In your essays, try to avoid referring to monopolies as being monopolistic. It would suggest that you do not really know the difference between the terms, so keep them separate. Remember, monopolies are single firms operating in the whole market, giving them complete market power, and monopolistic competition is when there are many firms with some market power due to brand loyalty.

Perfect competition

A perfectly competitive market structure is a hypothetical market structure in which there are many firms, each with a small market share, that all sell an identical product. We assume that there is perfect information available to firms and consumers about prices and quality of goods, and that firms can freely enter and exit the market.

These characteristics produce one very important consequence for firms in this market: they have to take the price set by the entire market and they do not have enough market power to influence it.

Figure 3. Dairy produce can be an example of perfect competition.

Even though this is a hypothetical market structure, there are some industries that come close. Commodities are types of goods, usually primary goods and natural resources, for which it does not matter who produces them. Commodities have full or partial fungibility . This means they are perfectly interchangeable with goods from other producers. Examples include coal, crude oil, corn, soybeans, milk and sugar. In some of these cases, producers have very little ability to bargain over the prices of the goods. Dairy farmers are often at the mercy of large supermarkets and must accept the prices set by the market. It is easy for supermarkets to buy from other farmers because milk from one supplier is easily substituted by milk from another one.

The table below summarises the different types of market structure.

Table 1. Types of market structure.

Overview (/study/ap 186- cid- 754025/

Market structure	Number and size of firms	Competition	Market power	Example
Monopoly	One large firm	None	All	Microsoft
Oligopoly	A few large firms	Not much but strong interdependence between firms	Limited	Utilities
Monopolistic competition	Many small firms	Strong	Limited	Clothing
Perfect competition	Many small firms	Perfect	None	Milk

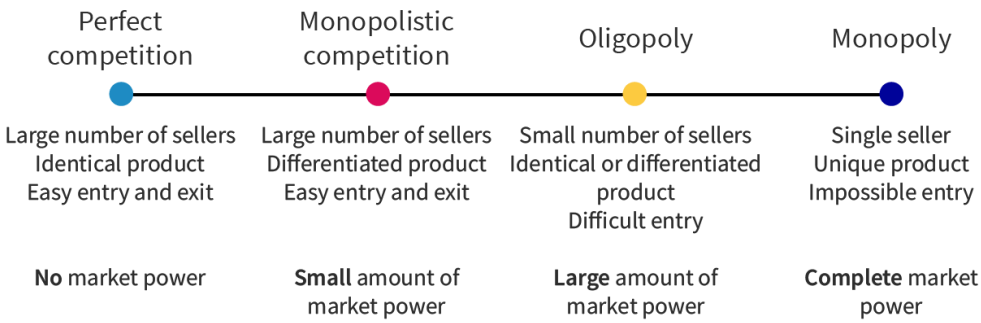

Figure 4. Market structures in order of control.

More information for figure 4

3 section questions

2. Microeconomics / 2.11 Market failure — market power (HL)

Rational producer behaviour

Section Student... (0/0) Feedback Print (/study/app/pp/sid-186-cid-754025/book/rational-producer-behaviour-id-30951/print/) Assign

Student view

Remember that our job as economists is slightly different from the job of a business owner. We are not studying how businesses can make more profit. We want to know what conditions allow efficient economic decisions to be made, and if we assume that all firms practice profit maximisation, then we know that this motivation is central to market efficiency. When firms act as profit maximisers, we say that they are behaving rationally – they have studied their costs and acted in a way that will minimise those and make the most profit for their owners.

An accountant may say to the company's owner, 'you should be happy, this year you have achieved a total profit of USD 100 000'. However, an economist may look at the same evidence and say: 'you should be satisfied, but only just!'

How is this possible?

For economists, the calculation of profits follows this formula:

Total profit = total revenue – total costs

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where,

Total costs = fixed costs + variable costs + **opportunity costs**

The opportunity cost (also called implicit cost) accounts for the second best alternative for the resource being used in the production of a good or service.

Those could be the earnings that a firm could have had if it had employed its factors in another use or if it had hired out or sold them to another firm. For example, the owner of a firm may be able to earn USD 130 000 per year in her next best alternative job, as an IT manager in the USA. Another example, a building that is used to produce goods could be rented out to other firms for USD 20 000 per month.

Economic costs are defined as the sum of implicit and explicit costs, with implicit costs being the opportunity cost of the business decision and explicit costs being the costs of production itself. A person in business is only concerned with covering the explicit costs (any costs to a firm that involve the direct payment of money), but economists are also interested in the implicit costs. For economists, costs are called economic costs (explicit + implicit costs).

If a firm only *covers* its economic costs (explicit + implicit costs), the firm is said to be making a normal profit. Once a firm surpasses this level, it is said to be making an **economic** or abnormal profit.

Costs of production

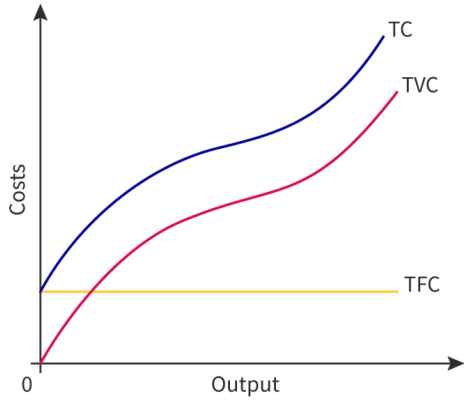
Be aware

Please be advised that while the syllabus does not explicitly outline the various categories of production costs, familiarizing yourself with these cost types is highly recommended. This knowledge will significantly enhance your comprehension of revenue and profit concepts in the subsequent chapters.

Student view

Employing factors of production in an attempt to produce something useful and sellable will cost firms money. The costs of production can be broken down in terms of total, average and marginal costs.

In the **short term**, there will be some fixed costs that do not change. Fixed costs are the costs that do not vary when output changes. An example of a fixed cost is rent. Variable costs are those costs that do vary when output changes. An example of a variable cost is the materials and components for production.



Overview (/study/ap 186- cid- 754025/

Figure 1. Total cost, total variable cost and total fixed cost.

More information for figure 1

The image is a graph demonstrating the relationships between Total Cost (TC), Total Variable Cost (TVC), and Total Fixed Cost (TFC) relative to Output. The X-axis represents Output, while the Y-axis represents Costs. The graph features three curves:

1. The Total Cost (TC) curve, which starts at a higher point on the Y-axis than the other curves and increases at an increasing rate as output rises.
2. The Total Variable Cost (TVC) curve, which begins from the origin and increases, representing costs that vary with output.
3. The Total Fixed Cost (TFC), depicted as a horizontal line indicating constant costs that do not change with output.

The vertical distance between the TC and TVC curves represents the TFC, showing that TC equals the sum of TVC and TFC at all output levels.

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Figure 1 outlines the relationships between the total cost, the total variable cost and the total fixed cost. You will notice that the vertical distance between the total cost and the total variable cost is the total fixed cost. In other words:

Total cost = total variable cost + total fixed cost

We can also calculate the cost per worker and the additional cost per worker, which are shown in **Figure 2**. The average cost is the cost per unit of output. This can be broken down into the average fixed cost and the average variable cost. The marginal cost is the additional cost that an additional unit of output incurs. The marginal cost curve intersects the average cost curve (in this case both average total and average variable costs) at the lowest point of the average cost curve.

Student view

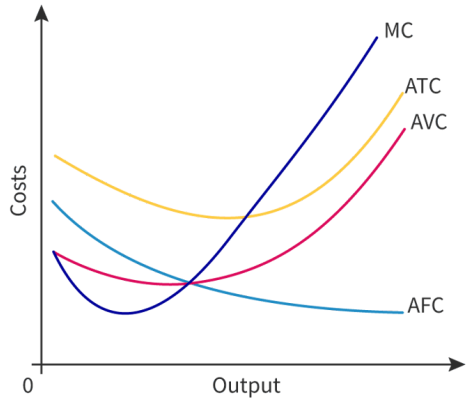

Figure 2. Marginal and average cost curves.

More information for figure 2

The graph displays cost curves, including marginal cost (MC), average total cost (ATC), average variable cost (AVC), and average fixed cost (AFC), against output. The x-axis represents the output starting from zero, and the y-axis represents costs with no specific units indicated. The marginal cost curve (MC) is shown intersecting the average cost curve at its lowest point. Each curve is labeled: MC in blue, ATC in yellow, AVC in red, and

AFC in light blue. The AFC curve decreases, while the ATC, AVC, and MC curves are U-shaped, indicating an initial decrease in cost with increased output, followed by an increase after reaching a minimum point. The U-shaped nature of the ATC and AVC curves suggests that costs initially decline due to economies of scale, after which they rise as production increases, highlighting diseconomies of scale.

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Be aware

The marginal cost curve must always intersect both average cost curves (average total and average variable) at their lowest points.

Figure 3 only shows the marginal and average cost curves. The cost values for a firm exhibit diminishing marginal returns once productivity per worker begins to slow down and costs begin to rise. This concept describes the relationship between inputs and outputs, as a firm employs more variable units of inputs in the short run (when one factor of production is fixed). Wages need to be paid per worker, and as we employ more labour, the relative gains in output will decrease. This is because, after a certain point, each time an additional worker is added, it will increase output by a smaller and smaller amount. There may even be a point at which each additional worker decreases overall output. This will mean that the marginal cost will start to increase relative to the increase in output. At some point the cost per worker, or average cost, will also begin to rise.

Economists often say that the marginal pulls the average up or down. For example, if a fishing boat catches another tuna fish which is large, the average weight of all caught tuna will go up. If the tuna fish was small, then the average weight of the entire catch would go down.

The formulae for average cost and marginal cost are given by:

$$\mathrm{MC} = \frac{\Delta \mathrm{TC}}{\Delta \mathrm{Q}}$$

Marginal cost is equal to the change in total cost divided by the change in quantity.

$$\mathrm{AC} = \frac{\mathrm{TC}}{\mathrm{Q}}$$

Average cost is equal to total cost divided by quantity.

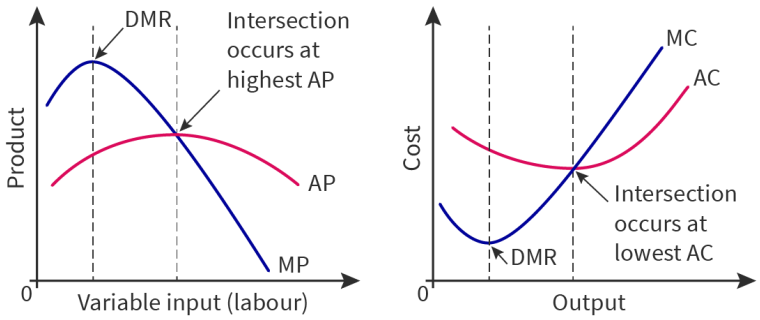

Figure 3. The law of diminishing marginal returns (DMR) with MP (marginal product), AP (average product), MC (marginal cost), AC (average cost).

More information for figure 3

The image consists of two graphs explaining the Law of Diminishing Marginal Returns (DMR).

On the left: - The X-axis is labeled 'Variable input (labour),' starting at 0. - The Y-axis is labeled 'Product,' starting at 0. - The blue curve labeled 'MP' (marginal product) shows a rise and then a decline, representing the increase and then decrease in output with added labor. A point labeled 'DMR' marks where the decline begins. - The red curve labeled 'AP' (average product) shows a gradual rise and then a decline, intersecting with the MP curve at the highest AP point. - Text annotations indicate 'DMR' and 'Intersection occurs at highest AP.'

On the right: - The X-axis is labeled 'Output,' starting at 0. - The Y-axis is labeled 'Cost,' starting at 0. - The red curve labeled 'MC' (marginal cost) starts high, dips, and then rises again, showing the cost per additional unit of output. - The blue curve labeled 'AC' (average cost) starts high, dips more gradually, and then increases, intersecting with the MC curve at the lowest point of AC. - Text annotations indicate 'DMR' and 'Intersection occurs at lowest AC.'

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Activity

The diminishing marginal returns of making paper chains

Figure 4. Making paper chains in groups is a good way to get an understanding of the principle of diminishing marginal returns.
Credit: Getty Images Vstock

This is an activity that is really helpful to see how the law of diminishing returns works. Your teacher needs to supply the class with plenty of paper, scissors and glue. You may only cut the paper with the scissors, no tearing the paper.

In the first round, you will work as individuals to make paper chains. How many links in a chain can you make in a minute?

In the second round, you will make paper chains in pairs, but with only one set of scissors and glue between you. How many links in your chain this time?

Continue completing rounds of paper chains, each time with an additional person in the group, but with only one set of tools between you. After how many team members do you start becoming less productive?

Make sure you recycle the paper in a recycling bin, or use your paper chains to decorate your classroom!

Overview (/study/ap 186-cid-754025/

Revenues

As you know from previous discussions about price elasticity of demand, total revenue is given by the formula:

Total revenue = price × quantity

Like we did with production and costs, we need to further define revenues in terms of their average and their marginal rates. These are given by the following formulas:

$$\mathrm{MR} = \frac{\Delta \mathrm{TR}}{\Delta \mathrm{Q}}$$

Marginal revenue is equal to the change in total revenue divided by the change in quantity.

$$\mathrm{AR} = \frac{\mathrm{TR}}{\mathrm{Q}} = \mathrm{P}$$

Average revenue is equal to total revenue divided by quantity, which is equal to price.

Marginal revenue is the additional of revenue from each additional unit of output, and is calculated by dividing the change in **total revenue** by the change in output. **Average revenue** is just another term for the selling price per unit, so the average revenue curve for the firm is also the demand curve for the firm. The relationship between MR and AR is the same as the tuna example explained previously. A lower MR will bring AR down, but a higher MR will increase AR.

Profit maximisation

Student view

Figure 5. Firms are always keen to know when they start making a profit.

Credit: Getty Images Virojt Changyencham

In order to understand the next diagrams, you could jump to section 2.11.3 Perfect competition (/study/app/pp/sid-186-cid-754025/book/perfect-competition-id-30952/), but here we have an introduction to the supply and demand curves in a perfectly competitive market.

Overview (/study/ap 186- cid- 754025/

The diagrams below represent the whole industry (**Figure 6a**) and one individual firm in that industry (**Figure 6b**).

Imagine that the market supply curve (**Figure 6a**) includes all individual firms in the market, so a single firm alone has **no** influence on the market price. For that reason, the price of equilibrium in the market (**Figure 6a**) is transferred to the individual firm. That is the reason why a single firm in a perfectly competitive market structure is called a price-taker.

For that reason, a single firm in the market would face a perfectly elastic demand curve (**Figure 6b**) . In this case, the price of the product would be equal to the AR (average revenue) as well as the MR (marginal revenue).

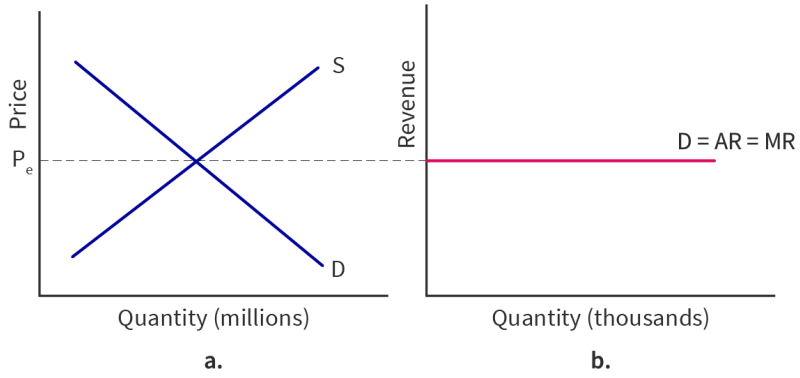

Figure 6. A perfectly competitive market.

More information for figure 6

The image depicts two side-by-side graphs labeled as 'a' and 'b'.

Graph 'a' is a typical supply and demand curve: - The X-axis is labeled 'Quantity (millions)', and the Y-axis is 'Price'. - The supply curve (S) and demand curve (D) intersect at a point marked as 'P_e', indicating the equilibrium price.

Graph 'b' shows a perfectly elastic demand curve: - The X-axis is labeled 'Quantity (thousands)', and the Y-axis is 'Revenue'. - It features a horizontal line labeled 'D = AR = MR', representing a perfectly elastic demand at a fixed price where average revenue equals marginal revenue. - The horizontal line indicates that any quantity can be sold at this price, typical in perfectly competitive markets.

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Student view

There are many advantages to firms trying to maximise profits. First, maximum profits mean that the owners or shareholders get the most back on their original investment. Entrepreneurs are rewarded with profits. Second, firms can use these profits to fund research and development, thereby securing a place in the market. Third, maximising profits is a very clear goal for employees and managers, which allows targets to be set, and wages can be tied to profits as an extra incentive.

There is a simple way of finding the point where profit is maximised, and that involves looking at the difference between the total revenue and the total cost, which will give us the profit for the firm.

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There is another way of figuring out the level that the firm should produce if its aim is to maximise profits, and that requires us to look at marginal revenue and marginal cost. In a simple way, if a firm would like to maximize its profits, it should produce when MC = MR. This is an important method.

It is important to remember that both the marginal revenue and marginal cost are the gradients for total revenue and total cost respectively. In other words, they are the rates of change of total revenue and total cost.

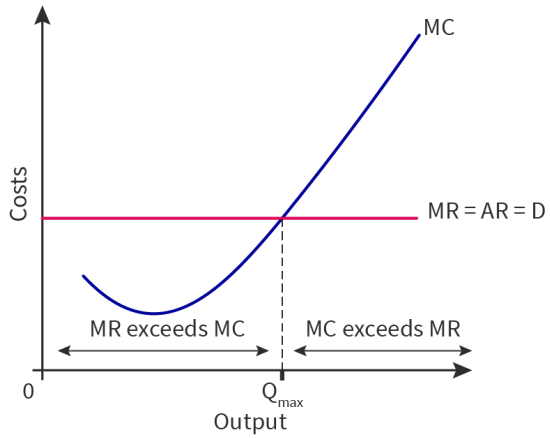

Figure 7. Marginal cost and marginal revenue for a perfectly competitive firm.

More information for figure 7

This graph illustrates the marginal cost (MC) and marginal revenue (MR) for a perfectly competitive firm. On the vertical axis, the graph shows costs with no specified values. The horizontal axis represents output, with a point labeled Q_max indicating the maximum output. The MC curve is upward-sloping and intersects the horizontal MR curve at Q_max. To the left of Q_max, the MR exceeds MC, suggesting an area of increasing profit with additional output. To the right of Q_max, MC exceeds MR, indicating a decrease in profit with additional output. The MR curve is also labeled as AR (Average Revenue) and D (Demand).

[Generated by AI]

Student view

Figure 7 shows a marginal cost curve plotted with a horizontal marginal revenue curve. A horizontal MR curve means that revenue, and so price per unit, is constant with output. Initially, when the firm adds a unit of output, it gains more revenue for that unit than that unit costs to make. Therefore, profits will have grown and logic tells us that we have not yet reached the level of highest profit. The firm will continue to make more profit as it produces more output if marginal revenue exceeds marginal cost.

Be aware

Both the marginal revenue and marginal cost are the gradients for total revenue and total cost, respectively. In other words, they are the rates of change of total revenue and total cost.

The profit-maximising level of output for any firm is therefore the point when marginal revenue equals marginal cost. Have a look at **Table 1**, which gives the revenues and costs for a firm facing imperfect competition.

Table 1. Revenues and costs for a firm facing imperfect competition (in USD). Note that the marginal figures (marginal revenue and marginal cost) occur 'between' the other figures, and therefore indicate change.

	Output	Price per unit	Total revenue	Marginal revenue	Total cost	Marginal cost
	1	10	10		1	
Marginal figures = change				8		2
	2	9	18		3	
Marginal figures = change				6		2
	3	8	24		5	
Marginal figures = change				4		4
	4	7	28		9	
Marginal figures = change				2		5
	5	6	30		14	
Marginal figures = change				0		6
	6	5	30		20	
Marginal figures = change				−2		7
	7	4	28		27	
Marginal figures = change				−4		8
	8	3	24		35	

Worked example 1

For the values in **Table 1**, work out the total profit earned for each unit of output and compare that to the difference between marginal revenue and marginal cost.

For output from 1 through to 8 inclusively, total profit is:

USD 9, USD 15, USD 19, USD 19, USD 16, USD 10, USD 1, −USD 11.

With the fourth unit of output added to production, marginal revenue is USD 4 and marginal cost is USD 4.

Overview (/study/ap 186- cid- 754025/

At the point where marginal revenue equals marginal cost, total profit will have stopped growing. Therefore, total profit will have reached its highest point; total profit has been maximised. Beyond this point, as you can clearly see from your calculations above, total profit starts to fall from USD 19 to USD 16 and downwards.

In the worked example, there were two levels of output that each gave us a total profit of USD 19. This might seem confusing at first, and you may wonder why the fourth unit gives us the profit maximising level of output. It is between the third and fourth unit that profit is maximised, and if we plotted our results on a graph profit would peak between those numbers. Over larger ranges of output, this would be more obvious – for example, between 3000 and 4000 units of output.

Important

The **profit maximising level of output** is found when the difference between total revenue and total cost is greatest, or when marginal revenue equals marginal cost or **MR = MC.**

We are going to use **Figure 8**, which shows the marginal costs (MC), the average total costs (ATC) and the average variable costs (AVC) at different levels of output, to discuss different situations in which a firm may, or may not, make economic profit.

Figure 8 the company would have to sell its goods/services at P_5 in order to cover the ATC (average total costs). Remember that for an individual firm in a perfectly competitive market, the price is derived from the industry's equilibrium price. In this case, the perfectly elastic demand curve would be at P_5, and so it would be its MR (marginal revenue) curve.

As you learned before, the profit maximizing point for a firm is where MC = MR, which means that this firm would be producing at Q_5. At this point, the AR (average revenue) or the price per unit is exactly the same as the ATC (average total cost).

Student view

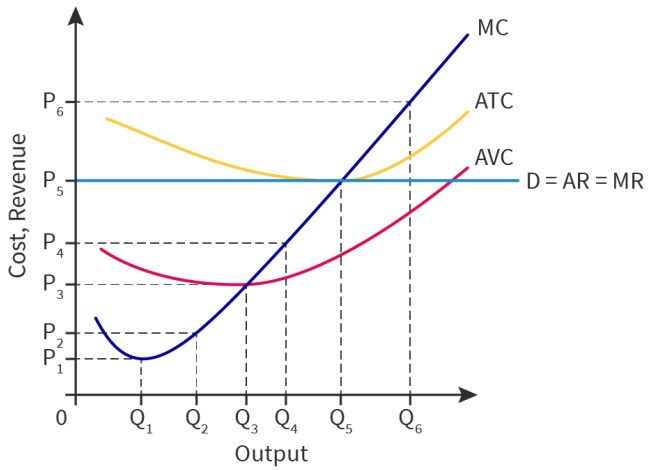

Figure 8. Marginal and average costs.

More information for figure 8

The image is a graph illustrating the relationships between different cost curves and output levels.

- **X-axis**: Represents "Output" with labeled intervals from Q1 to Q6.
- **Y-axis**: Represents "Cost, Revenue" with labeled intervals from P1 to P6.

There are four main curves on the graph:

1. **MC (Marginal Cost)** curve: A blue, sharply increasing curve that crosses the D=AR=MR line at point Q5.
2. **ATC (Average Total Cost)** curve: A yellow curve that is U-shaped, decreasing then increasing, and intersects the D=AR=MR line at Q5.
3. **AVC (Average Variable Cost)** curve: A red curved shape below the ATC, also U-shaped, and intersecting below the D=AR=MR line.
4. **D=AR=MR** line: A blue horizontal line across the graph at level P5, indicating the Demand, Average Revenue, and Marginal Revenue are equal.

Overall, the graph shows at Q5, the MC curve intersects with the D=AR=MR line, indicating the profit-maximizing level of output where Marginal Cost equals Marginal Revenue, and the price per unit is aligned with the Average Total Cost.

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Making economic profit

As stated above, the only way a firm can make an economic profit is if the firm more than covers its economic costs. That is, it has to take in more revenue from selling its goods or services than it costs to produce them plus any opportunity cost the entrepreneur incurs by being in that business. As long as the price remains above average total cost, the firm will make an economic profit.

In **Figure 9** below, the perfectly elastic demand curve is at P_6. This means that MC = MR indicates that Q_6 is the profit maximizing quantity.

At Q_6, AR (average revenue) is greater than ATC (average total costs) resulting in economic profit (or abnormal profit) represented by the green area.

The purple area represents the total fixed costs. Remember that ATC = AFC (average fixed costs) + AVC (average variable costs).

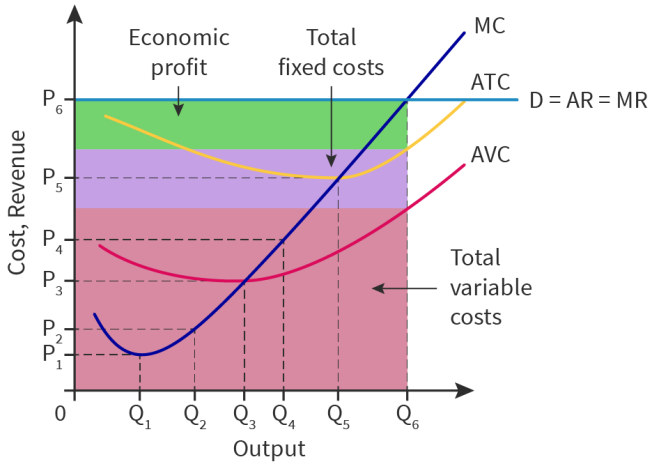

Figure 9. A firm earning positive economic profits.

More information for figure 9

The graph illustrates the relationship between cost, revenue, and output in a firm's profit analysis. The X-axis represents the output with points labeled Q1 to Q6. The Y-axis represents cost and revenue with levels between P1 and P6.

Overview (/study/ap 186- cid- 754025/

Several curves are visible: - MC (Marginal Cost) curve is upward sloping. - ATC (Average Total Cost) curve is depicted with a downward then upward slope. - AVC (Average Variable Cost) curve also shows a downward then slightly upward slope.

The area between the ATC and AVC curves is shaded purple, representing total fixed costs, while the area below the AVC curve is shaded pink, representing total variable costs. Another highlighted area above ATC, shaded green, represents economic profit.

The graph includes labels for different curves and costs, illustrating concepts like economic profit, total fixed costs, and total variable costs. It helps visualize how these financial concepts interact at various levels of output.

[Generated by AI]

✓ **Important**

A firm will make economic profit when the price is above average total cost.

Making zero economic profit

If a firm is making zero economic profit, its economic costs are equal to its total revenue. This will occur when the price equals average total cost. You can see in **Figure 10** that the pink and green shaded areas, representing total economic cost, are equal to the purple shaded area that represents total revenue. Remember that for a perfectly competitive firm, the D = MR and the maximizing profit quantity happens where MC = MR. In this case, the firm would produce at Q_5.

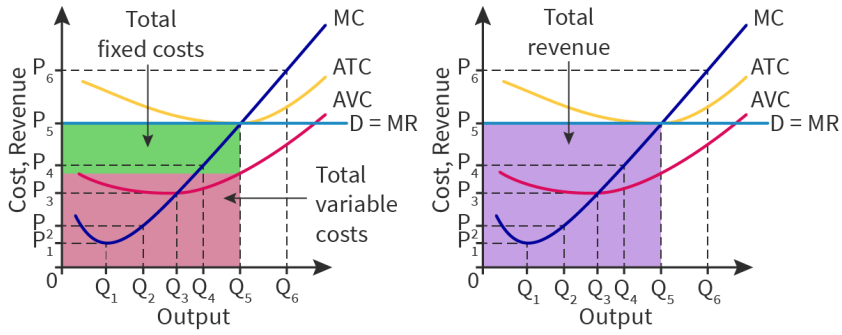

Figure 10. A firm making zero economic profit: total revenue equals economic cost.

More information for figure 10

The image consists of two graphs side-by-side that collectively illustrate the concepts of total cost and total revenue in relation to output for a firm making zero economic profit.

Left Graph: - **Axes:** The X-axis represents Output, marked from Q1 to Q6. The Y-axis represents Cost and Revenue, marked from P1 to P6. - **Curves and Lines:** - **MC (Marginal Cost):** The blue curve rises steeply as output increases. - **ATC (Average Total Cost):** The yellow curve is downward sloping and then rises, positioned above the AVC curve. - **AVC (Average Variable Cost):** The red curve is a U-shape beneath the ATC. - **D=MR (Demand = Marginal Revenue):** A horizontal line intersecting the Y-axis at P5. - **Shaded Areas:** - **Green Area:** Representing total fixed costs above P5. - **Pink Area:** Representing total variable costs from P2 to P3.

Right Graph: - **Similar Axes and Labels** as the left graph. - **Shaded Purple Area:** Represents total revenue, extending from the horizontal D = MR line at P5.

Student view

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Interpretation: - When the firm is producing at Q5, total revenue matches total economic cost, indicating zero economic profit. At this point, the price equals the average total cost, and the firm is making a normal profit, covering both production and implicit costs.

[Generated by AI]

When this occurs, a firm is said to be making a normal profit or enough profit to cover production costs and the implicit costs of the business decision. We can also say that the firm is breaking even.

Important

A firm will make zero economic profit when the price equals average total cost. It is said to be breaking even.

Making negative economic profit

If the price falls below the average total cost, the firm will not be making any profit. Indeed, the firm will be making zero economic profit or even a loss! **Figure 11** shows us this clearly. On the right-hand diagram, a price and marginal revenue of P_4 will result in an output of Q_4 and a total revenue equal to the green shaded area. Remember that the maximizing profit point is **always** when MC = MR.

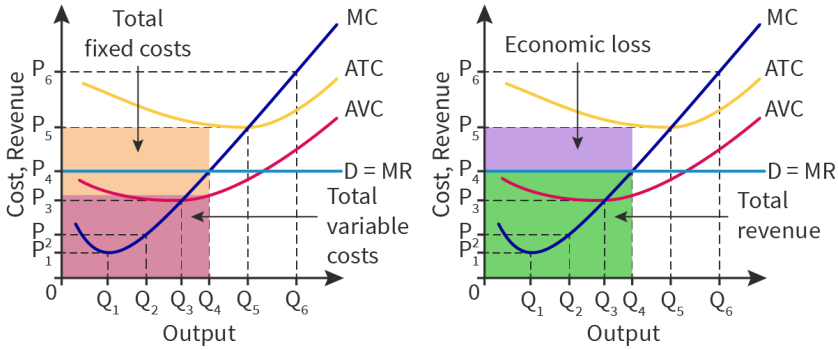

Figure 11. A firm making negative economic profit or a loss.

Student view

More information for figure 11

The image consists of two side-by-side diagrams. Each diagram features a cost and revenue analysis of a firm at various output levels, marked Q1 to Q6 on the x-axis.

Left Diagram: - The y-axis represents cost and revenue, while the x-axis represents output. - Curves: The blue line is the marginal cost (MC) curve. The yellow line is the average total cost (ATC) curve. The red line is the average variable cost (AVC) curve, and the horizontal blue line is the demand and marginal revenue (D = MR) curve. - Shaded Areas: The orange shaded area labeled as total fixed costs lies between P2 and P3 for output Q2 to Q3. The pink shaded area, labeled as total variable costs, covers up to P2 for the same output range.

Right Diagram: - Similarly structured to the left, the right diagram shows an economic scenario where total revenue is insufficient to cover total costs. - At output Q4, the price (P4) and marginal revenue result in lower revenue than costs. - Shaded Areas: The green shaded area indicates total revenue at Q4, covering prices from P2 to P4. Total revenue is lower than total costs, resulting in an economic loss depicted by the purple shaded area between the ATC and the revenue line (D = MR).

[Generated by AI]

However, the firm's costs at Q_4 (orange + pink areas on the left-hand diagram) will far exceed the total revenue at Q_4 (green area). On the left-hand diagram, for the quantity of Q_4, the ATC would be at P_5. On the left-hand diagram, total fixed costs (orange area) and total variable costs (pink shaded area) when added together, will be equal to the total cost of production. It is evident that the sum of the orange and pink shaded areas exceeds the green area on the right-hand side (the total revenue earned when Q_4 is sold for a price of P_4), and so there is an economic loss of the purple shaded area.

✓ Important

A firm will make **negative economic profit**, or a loss, when the price is **below** minimum **average total cost**.

Summary formula table

You need to make sure that you can remember all the equations for Paper 3.

Table 2. Summary of formulae for costs, revenues and profits.

Concept	Words	Shorthand
Total revenue	Price multiplied by quantity sold Average revenue multiplied by quantity sold	$P \times Q$ $AR \times Q$
Total cost	Fixed cost plus total variable cost Average total cost multiplied by quantity sold (Average variable cost plus average fixed cost) multiplied by quantity sold	$FC + VC$ $ATC \times Q$ $(AVC + AFC) \times Q$
Average revenue	Total revenue divided by quantity sold	$\frac{TR}{Q}$
Average cost	Total cost divided by quantity sold Average fixed cost plus average variable cost	$\frac{TC}{Q}$ $AFC + AVC$
Marginal revenue	Change in revenue divided by change in output	$\frac{\Delta TR}{\Delta Q}$
Marginal cost	Change in cost divided by change in output	$\frac{\Delta TC}{\Delta Q}$
Total profit	Total revenue minus total cost (Average revenue minus average cost) multiplied by quantity	$TR - TC$ $(AR - AC) \times Q$

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Activity

Try to come up with a table of data yourself for a perfectly competitive firm, with values for marginal cost, average total cost and average variable cost. Use the table to calculate the break even point, and a few points showing economic profits and losses being made.

5 section questions

Perfect competition

Section Student... (0/0) Feedback Print (/study/app/pp/sid-186-cid-754025/book/perfect-competition-id-30952/print/) Assign

Welcome to the first of four sections on different market structures. We will evaluate the success of each of the four market structures by exploring the following questions.

- What are the characteristics that determine the outcomes of this market structure?
- Are the price and quantity sold by the firm the best that they can be?
- Is the firm productively efficient?
- Is the firm allocatively efficient?

Degrees of market power

So far, we have assumed that prices are determined by the interaction of all buyers and sellers in a market. But what happens if there is only one firm selling the goods that we need? If fewer firms operate in each market, there is much less threat to a firm and its decisions. It has the power to try to control its revenues by deciding its own output and how much it will invest to expand, and to set prices. The ability of a firm to set its own prices, and thus how much **market power** it has, is a fundamental issue in this subtopic.

Student view

The degree to which an individual firm is able to set prices will determine how competitive the market is. Markets where firms have some or complete price setting ability are called imperfectly competitive markets, and markets where firms have no price setting ability are called perfectly competitive.

Characteristics

In a perfectly competitive market, each firm has a small market share, so each one is powerless to determine the price. They must charge the price set by the market. The diagram on the left of **Figure 1** shows that the price set by the market is $10. The firm diagram on the right faces a perfectly elastic demand curve D, which is also the marginal revenue of each additional good sold. Each firm is therefore a price-taker.

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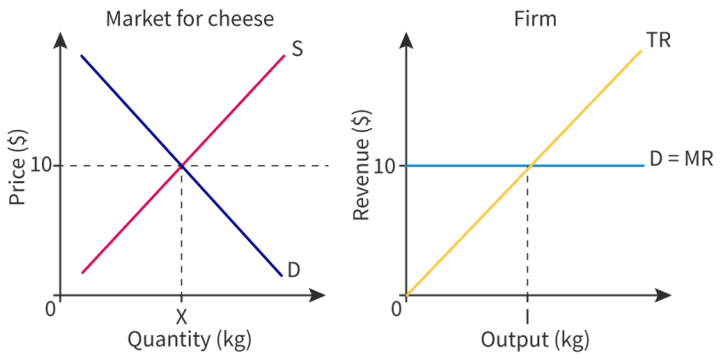

Figure 1. Firms in perfect competition are price-takers.

More information for figure 1

The image consists of two diagrams side by side: one representing the market for cheese and the other representing a firm's perspective in a perfectly competitive market.

On the left, the market diagram shows a standard supply and demand graph. The X-axis represents Quantity in kilograms and the Y-axis represents Price in dollars. A blue downward sloping line (labeled 'D' for demand) and a pink upward sloping line (labeled 'S' for supply) intersect at a point where the price is $10. This point denotes market equilibrium.

On the right, the firm's diagram has the X-axis labeled as Output in kilograms and the Y-axis as Revenue in dollars. The demand curve 'D', which is also the marginal revenue curve (M = R), is horizontal at the price level of $10, indicating a perfectly elastic demand. A total revenue (TR) line starts from the origin and slopes upwards.

These diagrams illustrate that in a perfectly competitive market, each firm faces a perfectly elastic demand curve and must accept the market price as given.

[Generated by AI]

Student view

Important

The characteristics of a perfectly competitive market are:

1. There are many small firms.
2. There is perfect mobility of resources.
3. There is perfect information.
4. Goods are identical or homogenous.
5. There is free entry and exit.

Revenues under perfect competition

Looking again at **Figure 1**, the firm must charge the price set by the market, which is $10. The firm's demand curve shows perfectly price elastic demand.

The price (average revenue) charged for each kilogram of cheese is $10 in the above example, so the marginal revenue is also $10. Regardless of the volume of output, each additional unit produced will result in an additional $10 revenue. The total revenue curve is a straight, upward sloping curve with a gradient equal to the marginal revenue.

Important

Remember that under perfect competition, the demand curve is the same as the average revenue curve, the price, and the marginal revenue curve.

Price and output of the firm

It is now time to combine everything we have learned so far about costs, revenues and profits. **Figure 2** shows the market and firm diagrams for perfect competition. By looking at average revenue, marginal revenue, average cost and marginal cost, we can determine this firm's output level, price and profits.

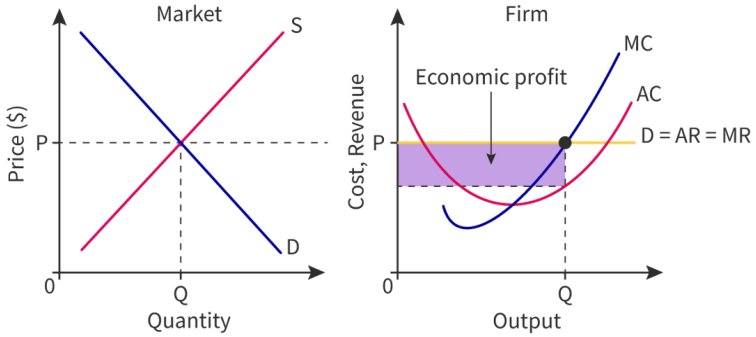

Figure 2. The determination of price and output for a perfectly competitive firm.

More information for figure 2

The image consists of two graphs side-by-side. The first graph, labeled 'Market,' has price ($) on the vertical axis and quantity on the horizontal axis. It shows an upward-sloping supply curve (S) and a downward-sloping demand curve (D). These curves intersect at the market-determined price, labeled 'P,' and quantity, labeled 'Q.' The second graph, labeled 'Firm,' has cost and revenue on the vertical axis and output on the horizontal axis. It includes several curves: a downward-sloping demand equals average revenue equals marginal revenue curve (D = AR = MR), an upward-sloping marginal cost curve (MC), and an average cost curve (AC) that is U-shaped and lies below the demand curve at the output level Q. There is a shaded purple box representing economic profit, indicating the area between the AC curve and the price level P, where the yellow line intersects with the demand curve. This indicates positive economic profits because the average cost is below the average revenue at the intersection point.

[Generated by AI]

Student view

At the market-determined price P, the profit-maximising firm will produce where marginal revenue equals marginal cost at Q. If we trace downwards, we can find the level of average costs and determine the total level of economic profits that this firm can earn. As the average cost curve lies below the average revenue curve, we know that this firm can earn positive economic profits in the area represented by the purple box.

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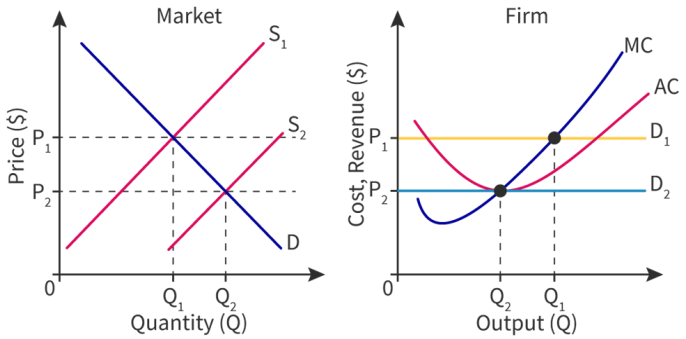

Figure 3. Contrasting the short and long run positions of a perfectly competitive firm.

More information for figure 3

The image contains two diagrams side by side.

Left Diagram: Market - **Axes**: X-axis represents Quantity (Q), and Y-axis represents Price ($). - **Curves**: - **Demand (D)**: Downward sloping. - **Supply 1 (S1)**: Upward sloping, starting from lower left to upper right. - **Supply 2 (S2)**: Parallel and right to S1, indicating increased supply. - **Intersections**: - **Price Points**: Price levels P1 and P2 are marked on the Y-axis. - **Quantities**: Q1 and Q2 on the X-axis, where the curves intersect.

Right Diagram: Firm - **Axes**: X-axis represents Output (Q), and Y-axis represents Cost, Revenue ($). - **Curves**: - **Marginal Cost (MC)**: Upward sloping, curve starting from lower left to upper right. - **Average Cost (AC)**: U-shaped curve below D1. - **Demand 1 (D1)**: Horizontal line at price level P1. - **Demand 2 (D2)**: Horizontal line at price level P2, below D1. - **Intersections**: - Shows cost and output levels at Q1 and Q2, indicated by the intersections of the curves.

The diagrams illustrate short-run profits and adjustments leading to long-run equilibrium in a competitive market.

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Student view

However this will not continue in the long run. As there is free entry and exit to the market (that is, negligible start-up or shut-down costs, no barriers to entry), new firms will enter this market, attracted by the economic profits. This will cause the market supply curve to shift from S_1 to S_2 in **Figure 3**, and the market price to fall from P_1 to P_2. This gives consumers greater choice, as we can see from the rise in market quantity from Q_1 to Q_2 on the market diagram . The firm's demand curve also falls, from D_1 to D_2, causing the output of the firm to fall from Q_1 to Q_2.

It is possible that so many new firms will join the market that the firm will make an economic loss. If this persists, firms may be forced to shut down.

In the long run, the market will find an equilibrium in which the firm's demand curve will naturally sit at the bottom of the average cost curve, where no economic profit can be earned. We say that profits are ‘competed away’.

Important

It is possible for a perfectly competitive firm to earn economic profits in the short run. However, in the long run these are competed away.

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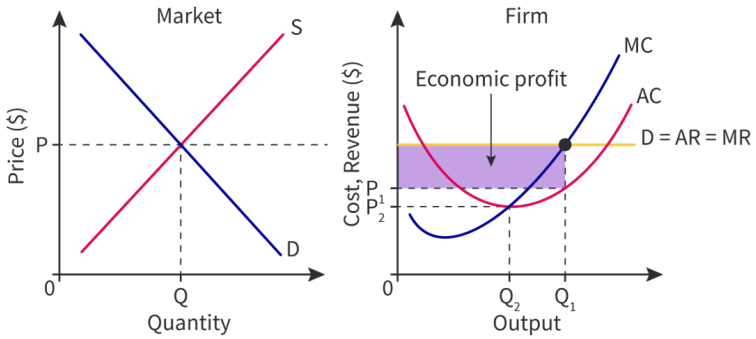

Figure 4. A perfectly competitive firm is not productively efficient in the short run.

More information for figure 4

The image contains two side-by-side graphs. The left graph represents a market with a supply and demand curve. The x-axis is labeled "Quantity" and the y-axis is labeled "Price ($)". The supply curve (S) slopes upward, and the demand curve (D) slopes downward, intersecting at point (Q,P).

The right graph illustrates a firm's cost and revenue curves. The x-axis is labeled "Output" and the y-axis is labeled "Cost, Revenue ($)". It features a downward-sloping demand curve labeled "D = AR = MR", an average cost curve (AC) that is U-shaped, and a marginal cost curve (MC) that intersects the AC curve at its lowest point. Between the AC and demand curve is a shaded area labeled "Economic profit". The curves intersect at point Q2 below the demand curve on the x-axis, signifying the short-run equilibrium. The axis labels and intersection points indicate relationships relevant to the short-run non-productive efficiency of the firm.

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The productively efficient point for any firm will be when it is operating at lowest average cost . We already know that this occurs when the marginal cost and average cost curves intersect.

Looking at **Figure 4**, we can see that the short-term equilibrium point for the firm at Q_1 does not occur where average cost is lowest. However, this does occur when output is Q_2. In the long run, the firm's demand curve will intersect the average cost curve at that point and that is the point where the firm is productively efficient.

Student view

✓ **Important**

A firm's productively efficient level of output occurs when the marginal cost equals the average cost, or MC = AC.

Allocative efficiency

In earlier subtopics we discussed the idea of allocative efficiency. This is the point at which the market allocates resources at the socially optimal level of output. This occurs when supply equals demand or marginal social benefit equals marginal social cost.

We can illustrate this concept in the firm diagrams. The firm diagram has a demand curve D and a marginal cost curve MC. At the intersection of these two curves, the firm would be allocatively efficient. Looking back at **Figure 3**, we can see that in the short run equilibrium at P_1 and Q_1, marginal cost intersects the demand curve, making the

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firm allocatively efficient. In the long run, at P_2 and Q_2, the firm is also allocatively efficient. As long as price or average revenue exceeds marginal cost, output should continue to be increased until price equals marginal cost, because community surplus will continue to increase up to that point.

Because AR always equals MR in perfect competition, and profit maximisers will produce where MR = MC, it holds that perfectly competitive firms will always produce where MR = MC = AR, and will always be allocatively efficient.

Important

A firm's allocatively efficient level of output occurs when the marginal cost equals the average revenue, or MC = AR.

Evaluation of perfectly competitive markets

In all, perfect competition is a very desirable, albeit entirely hypothetical market structure. In the short run, firms are able to earn abnormal profits, while being allocatively efficient. Prices and output will be lower than in other market structures and in the long run firms will be productively efficient.

In reality, though, no market structure is likely to ever be perfect. Markets will always suffer from imperfect information, and no market is going to sell an identical product. There are some situations where the product is very similar (for example, the market for crude oil), but there are still slight differences in the product and in the way that it is sold.

Exam tip

Before your conclusion in any essay about this topic, your analysis should include comments about:

- price and output compared to other market structures or outcomes.
- productive efficiency.
- allocative efficiency.
- reasons why the market structure might be desirable anyway.

Student view

4 section questions

2. Microeconomics / 2.11 Market failure — market power (HL)

Monopoly

Section Student... (0/0) Feedback Print (/study/app/pp/sid-186-cid-754025/book/monopoly-id-30953/print/) Assign

Overview (/study/ap 186- cid- 754025/

Monopoly is a word often used in conversation, which means that a dominant position is held by someone or something. In the context of economics, it has the same meaning, but we apply our analytical tools to explain why they are usually not a good thing.

Characteristics

Monopolies are characterised by there being only one producer or firm, high barriers to entry to prevent other firms from joining, and, as a result, no close substitutes available for consumers. Because there is only one firm operating, there is limited choice for consumers. This results in a relatively steep downward sloping demand curve for the firm. The firm could, if it wanted to, alter its output and adjust its price.

However, because we assume firms are rational and want to maximise profits, they will always produce where MR = MC. Looking at **Figure 1**, we trace that intersection upwards to the demand curve, which determines the price of the good sold at P.

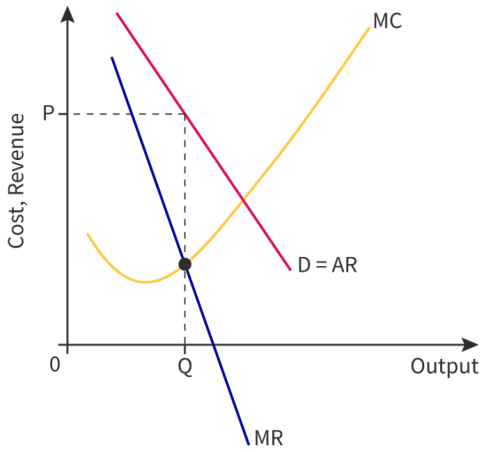

Figure 1. A monopoly's demand curve is relatively steep.

More information for figure 1

Student view

The graph depicts a monopoly's demand and cost curves. The X-axis represents 'Output' starting from 0 and increasing towards the right. The Y-axis depicts 'Cost, Revenue' starting from 0 and increasing upwards. There are three main curves: a demand curve labeled 'D = AR' that slopes downward, a marginal cost curve labeled 'MC' that is U-shaped, and a marginal revenue curve labeled 'MR' that is steeper and downward sloping below the demand curve. The intersection point of the MR and MC curves is marked, and a line from this intersection traces upwards to meet the demand curve at point 'P', which indicates the price level. The quantity at the intersection is marked as 'Q'.

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Important

The characteristics of a monopoly are:

1. One large firm operates in the market so the firm is the market.
2. There are no close substitutes.
3. There are strong barriers to entry and exit.

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Revenues under imperfect competition

Any firm that faces a downward sloping demand curve is a firm that has some degree of market power. This makes it an imperfect market structure, as consumers have less ability to switch between firms. This is because the firm can adjust output and the result will be a different price. We say that the firm has price setting ability, and is therefore a price-setter.

You will remember that along a straight line demand curve there is varying price elasticity of demand. It is also true that the demand curve is the same as average revenue (AR).

Figure 2 shows AR, MR and TR plotted together. On the upper portion of the demand curve, or AR, price elasticity of demand is relatively elastic. This means that any decrease in price will lead to an increase in total revenue, as the price falls by relatively less than the quantity demanded increases by. We can see that between a price of 10 and 5, quantity demanded increases from 0 to 25 and total revenue increases from 0 to 125. The marginal revenue curve remains above the x -axis until 25 units.

On the lower portion of the demand curve, price elasticity of demand is relatively inelastic. This means that any decrease in price will lead to a decrease in total revenue, as the price falls relatively more than the quantity demanded increases by. We can see that between a price of 5 and 0, quantity demanded increases from 25 to 50 and total revenue falls from 125 to 0. The marginal revenue curve falls below the x -axis.

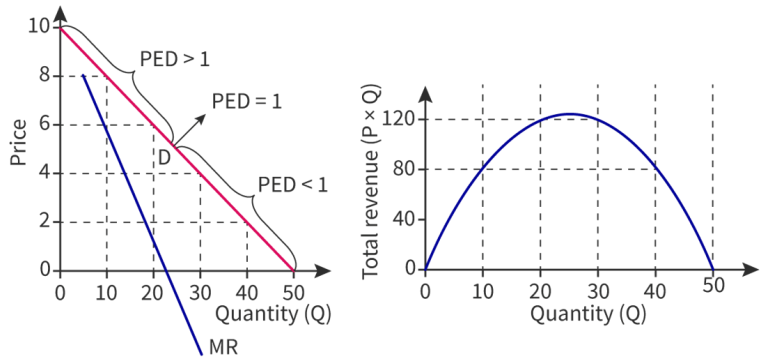

Figure 2. The relationship between average, marginal and total revenue.

More information for figure 2

The image contains two graphs side by side. The left graph illustrates the relationship between price and quantity (Q) with multiple curves. The X-axis represents quantity, ranging from 0 to 50, while the Y-axis denotes price, ranging from 0 to 10. There are three labeled sections on the demand curve (D): 'PED > 1', 'PED = 1', and 'PED < 1'. The marginal revenue (MR) curve is negatively sloped and crosses below the X-axis.

The right graph shows total revenue against quantity. The X-axis again represents quantity, ranging from 0 to 50, and the Y-axis represents total revenue, ranging from 0 to 120. The total revenue curve rises, peaks at around 20-30 quantity, and then declines, illustrating how revenue first increases and then decreases.

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Price and output of the firm

A profit-maximising firm will always produce where marginal revenue equals marginal cost, and this remains true for a firm operating in a monopoly. Tracing downwards from this point gives output Q. Tracing upwards to the demand curve reveals the price P.

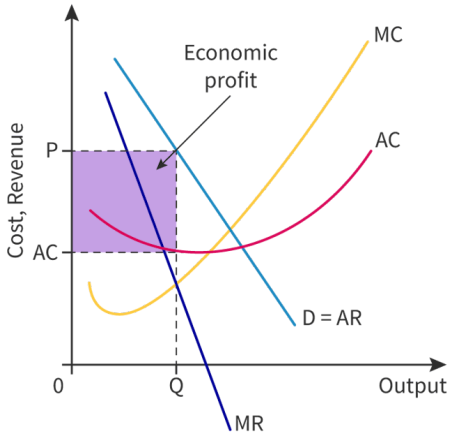

Figure 3. A monopoly is able to earn large economic profits.

More information for figure 3

The image is a graph illustrating how a monopolist can earn economic profit. The X-axis represents 'Output' while the Y-axis denotes 'Cost, Revenue.' Several curves are plotted on the graph: a downward-sloping demand curve labeled 'D=AR,' a marginal revenue curve labeled 'MR,' and an average cost curve labeled 'AC.' There's also a marginal cost curve labeled 'MC.'

The intersection of 'MR' and 'MC' determines the output level 'Q.' A vertical line drops down from this intersection to the X-axis to mark 'Q.' Moving upwards to the vertical intersection with the 'D=AR' curve sets the price 'P.'

A shaded purple box on the graph represents 'Economic profit.' Its area is determined by the difference between the price 'P' and the average cost 'AC,' multiplied by the level of output 'Q.' This visually indicates the economic profit a monopoly can achieve due to its market power.

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Student view

Figure 3 illustrates how a monopolist can earn abnormal or economic profits. An output of Q results in a price set of P. At a given level of output, the average cost is at AC per unit. Multiplying the difference between P and AC by the total output gives an economic profit, shown by the purple box.

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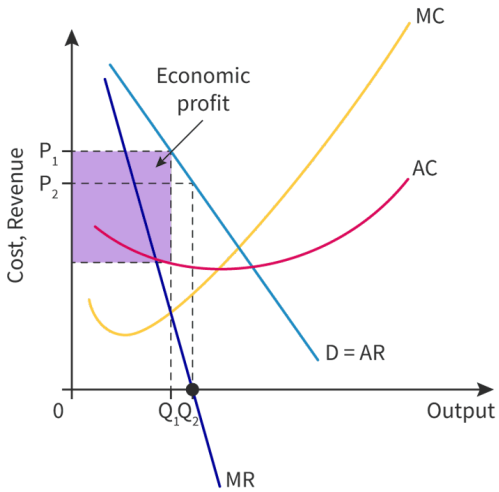

Figure 4. Comparing revenue maximisation with profit maximisation for a monopoly.

More information for figure 4

The graph illustrates a monopoly's revenue and profit maximization. The X-axis represents output, while the Y-axis indicates cost and revenue, both without specific numerical values. Several curves are visible:

- MC (Marginal Cost) curve is ascending.
- AC (Average Cost) curve is U-shaped.
- MR (Marginal Revenue) curve descends steeply.
- D=AR (Demand equals Average Revenue) curve is downward-sloping.

At points Q1 and Q2 on the X-axis, the curves intersect:

- Q1 marks where MR meets MC and corresponds to a higher price level P1 on the Y-axis.
- Q2 is where MR equals zero, resulting in a lower price level P2.

The purple shaded area represents economic profit between prices P1 and AC over the output range, highlighted in the purple box.

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Student view

If the firm was a revenue maximiser instead of a profit maximiser, the market outcomes would be slightly different. Looking at **Figure 4**, we can see that at the revenue maximising point, the output will be where marginal revenue equals zero, which is when output equals Q_2. This results in a lower price at P_2.

Regardless of the firm's motivation, the market outcomes will persist in the long run as long as there is no change to fundamental conditions which allow the market to operate.

Production along the price elastic portion of demand

While we tend to draw the demand curve relatively steeply in Paper 1, it is important to remember the relationships between PED, MR and the demand curve.

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We know that we draw a downward sloping demand curve, because price and quantity demanded have an inverse relationship. When prices fall proportionally less than quantity demanded increases, we know that total revenue will increase. This will occur along the demand curve, as long as MR remains positive. After all, MR is the rate of change of TR (in fact, it is the gradient of TR) and positive MR means that TR is growing. Looking back at **Figure 2**, we can see that the profit-maximising level of output MR = MC will always be where MR and MC are positive values. That must mean that the monopolist will only ever produce where PED is greater than 1.

⚠ Be aware

It is easy to be confused about monopoly demand curves. Because there are few substitutes, you might think that demand is always price inelastic. However, a downward sloping demand curve can have varying elasticities along it.

Productive efficiency

⚠ Be aware

The following concept, productive efficiency, is not part of the syllabus, so you will not be examined about it, but it might be helpful in developing your understanding on related concepts.

A monopoly doesn't need to be productively efficient, because it will make more profit at the profit-maximising level of output. There is no threat from competition to force it to try to minimise costs. **Figure 5** demonstrates the difference in outcomes between the profit-maximising output and the productively efficient output.

Student view

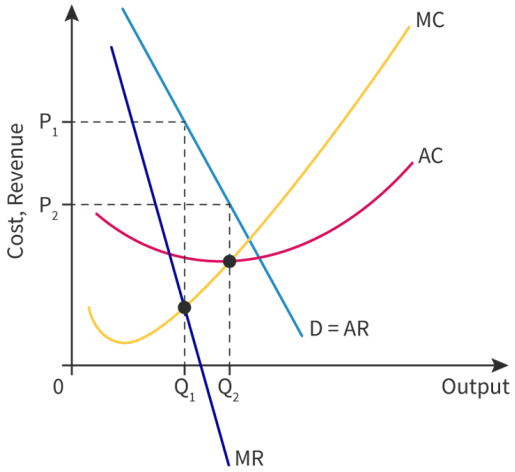

Figure 5. A monopolist is not productively efficient.

More information for figure 5

The graph represents various cost, revenue, and output curves for a monopolistic market. The x-axis is labeled 'Output,' while the y-axis is labeled 'Cost, Revenue.' The graph includes several curves:

1. **Marginal Cost (MC):** This curve is typically U-shaped, indicating how costs change with additional output.

2. **Average Cost (AC):** Similar to the MC curve but generally flatter, showing average cost per unit.

3. **Demand (D = AR):** The downward sloping demand curve represents the average revenue.

4. **Marginal Revenue (MR):** This curve slopes downwards and is steeper than the demand curve.

Key Points and Labels: - **P1, P2:** These are two horizontal lines showing price levels at different outputs. P1 is higher; P2 is the lower level. - **Q1, Q2:** Two vertical lines indicating outputs where Q1 is the profit-maximizing output and Q2 is the productively efficient output.

The graph illustrates that at Q1, the firm sets a higher price of P1, maximizing profit. At Q2, the firm reaches the lowest point on the AC curve, indicating productive efficiency, but at a lower price of P2.

[Generated by AI]

At Q_1, the profit-maximising output, the price set by the firm will be P_1. If it were to produce more efficiently, where marginal cost equals average cost, the firm would produce an output of Q_2. This would result in more choice for consumers, but also a much lower price of P_2. The productively efficient level of output for a monopoly firm is at Q_2, where AC is at its lowest point.

Allocative efficiency

A monopoly doesn't need to be allocatively efficient and there is no threat from competition to force it to allocate resources better. **Figure 6** demonstrates the difference in outcomes between the profit-maximising output and the allocatively efficient output.

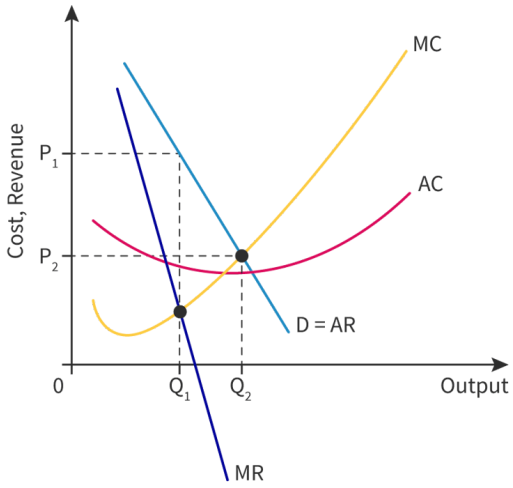

Figure 6. A monopolist is not allocatively efficient.

More information for figure 6

The graph illustrates the relationship between cost, revenue, and output for a monopolist. The X-axis represents output, while the Y-axis shows cost and revenue. There are key points labeled on the graph:

- Q1 represents the profit-maximizing output with a corresponding price of P1.
- Q2 represents the allocatively efficient output with a corresponding price of P2.

Student view

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D=AR (Demand equals Average Revenue) curve is shown, along with the Marginal Cost (MC), Average Cost (AC), and Marginal Revenue (MR) curves. The intersections of these curves represent critical decision points for the monopolist. At Q1, P1 is higher compared to P2 at Q2, indicating differences in price and output depending on the monopolist's goals. The graph highlights the inefficiency in resource allocation under a monopoly, where Q2 would offer a lower price and more output but is not chosen by the profit-maximizing monopolist.

[Generated by AI]

At Q_1, the profit-maximising output, the price set by the firm will be P_1. If it were to allocate resources more efficiently, where marginal cost equals average revenue, the firm would produce an output of Q_2. This would result in more choice for consumers, but also a much lower price of P_2, which is even lower than the price for the productively efficient level of output.

As firms have no threat from competition, they can exploit the market's community surplus to generate profits. There is, therefore, a welfare loss to society, which is represented by the purple triangle in **Figure 7.**

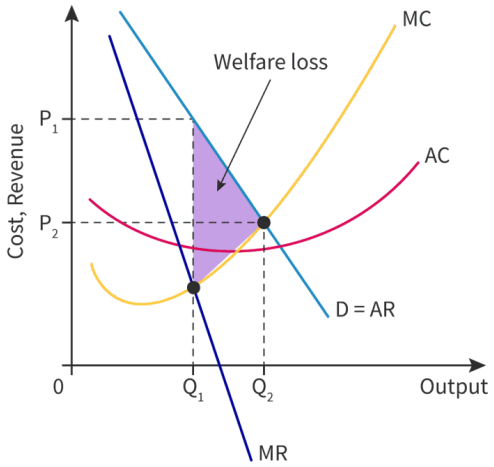

Figure 7. Welfare loss in a monopoly.

More information for figure 7

Student view

The graph shows the concept of welfare loss in a monopoly. The X-axis represents output, while the Y-axis represents cost and revenue. Key curves displayed are:

- The marginal cost (MC) curve which is upward sloping.
- The average cost (AC) curve also generally upward sloping.
- The demand curve, labeled as D = AR (demand equals average revenue), which slopes downwards.
- The marginal revenue (MR) curve, also downward sloping but steeper than the demand curve.

Important intersections include:

- The intersection of the MR curve with the X-axis at point Q1, representing the monopolist's output.
- The intersection of the MC and demand curves at point Q2, indicating the socially optimal output.

The area between these points and the demand curve outlines the welfare loss, represented by a purple triangle, showing the reduction in total welfare or surplus due to monopoly pricing as opposed to competitive equilibrium.

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Evaluation of monopolies

Monopolies are often controversial. When compared to a perfectly competitive firm, the monopolist charges a higher price (P_M compared to P_C in **Figure 8**), sells a reduced quantity to the market (Q_M compared to Q_C) and is not efficient in any way. This diagram shows the resulting consumer and producer surplus, compared to a perfectly competitive market. Producer surplus increases from the area under P_C and above MC to the entire purple shaded area. Consumer surplus decreases from the area above P_C and below D to just the green shaded area.

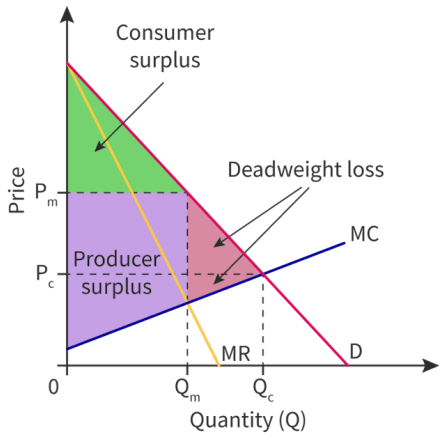

Figure 8. Comparing a monopoly with perfect competition.

More information for figure 8

The image is a graph that compares monopoly with perfect competition in terms of price and quantity. The X-axis represents Quantity (Q), ranging from zero to Qc (quantity under perfect competition) with Qm representing the lower quantity under monopoly. The Y-axis indicates Price, with Pm as the price under monopoly and Pc as the price under perfect competition.

The graph includes several lines: - The demand curve (D) is sloping downwards. - The marginal cost curve (MC) and marginal revenue curve (MR) are included.

Areas are shaded to illustrate surpluses: - The region labeled "Producer surplus" is shaded in purple, showing the area under the price Pm and above the marginal cost curve (MC). - The green area marked as "Consumer surplus" is the region above the price Pm and below the demand curve (D). - The area depicting "Deadweight loss" is shaded between Qm and Qc, illustrating the loss in total welfare due to monopoly pricing.

The arrows in the image indicate how total surplus distribution changes between producer and consumer surplus due to the presence of monopoly versus perfect competition.

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Student view

Many countries have legislation in place to prevent monopolies arising. Examples of government action against monopolies include:

- In 1911, the US government broke up the company Standard Oil into more than 50 smaller companies.
- In the 1980s, the UK government imposed a price ceiling on British Telecom to ensure that it did not take advantage of its monopoly position with consumers.

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- In 2017, the EU fined Google EUR 2.42 billion for manipulating the shopping information displayed during web searches.

Measures that the government can take include setting a price ceiling on the monopolist, legislating against predatory behaviour or, in some countries, breaking up the firm. In the USA, anti-competitive behaviour can be prosecuted under criminal law and is considered tantamount to theft. By contrast, in the EU, anti-competition is only civil law, which means it is subject only to fines. Monitoring competition in a country is costly and takes time. The government will need to dedicate significant resources to it.

Nevertheless, there may be some circumstances when we might want a monopoly to exist. Monopolies have the ability to divert profits to research and development of better products and new technologies. A famous example is the pharmaceutical industry, where the research process can take decades. To encourage firms to undertake this research, governments allow firms to register new drugs and apply for a patent. A patent is a legal protection from competition by other firms. It means the firm with the patent is the only producer allowed to manufacture the product.

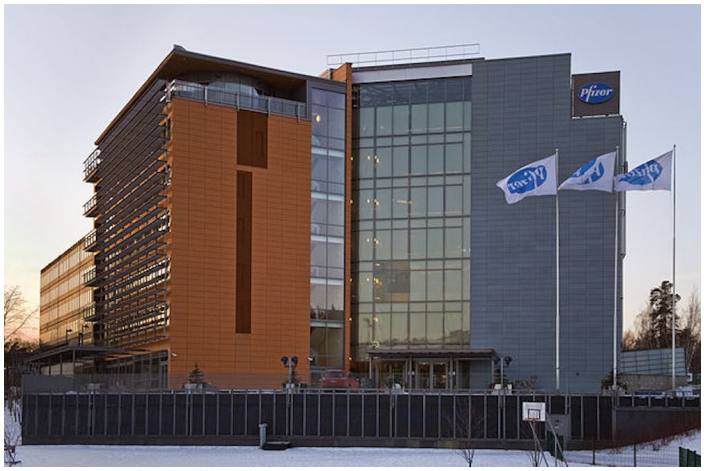

Figure 9. Pfizer is a US pharmaceuticals company with patents for many of its products.

Student view

However, research and development may not be relevant for all monopoly firms. It will very much depend on the type of industry they are in. It will be relevant for companies that need to be responsive to research and development, as well as those that are under a degree of pressure to innovate. For example, the private owner of the sole canteen in the school is neither in an industry where innovation is particularly dynamic nor under much pressure to undertake research. So we can imagine that research and development (R&D) could be a benefit, but not in every industry.

Apple is a market leader in the computer, tablet and phone industry and continues to innovate on products. This adds some credibility to the argument that R&D will occur in some markets, but even here it might not be because it has a degree of monopoly power. The reason might be because Apple operates in a contestable market. It does not innovate because it has a degree of monopoly power, it innovates because there is the threat of entry from other firms. Strictly speaking, a monopoly does not have to spend money on R&D to survive. If it does, it might be for other reasons and not because it is a monopoly and can afford to.

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Another reason that a monopoly can be beneficial is that a monopoly firm can achieve economies of scale and, over time, may reduce its costs by becoming more efficient and potentially decreasing price. This can be shown in the following diagram.

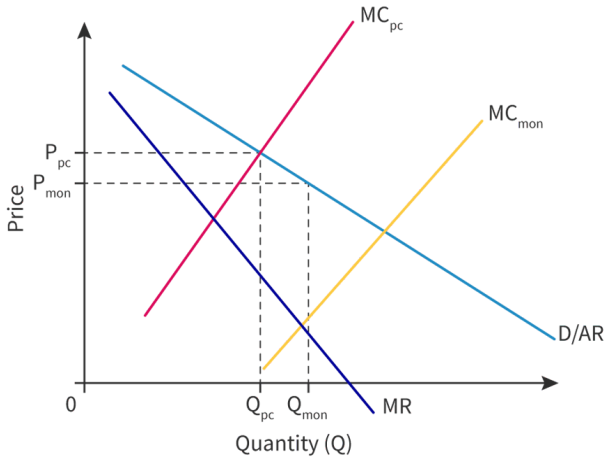

Figure 10. A monopoly can achieve economies of scale.

More information for figure 10

The diagram illustrates the concept of economies of scale within a monopoly. The X-axis represents Quantity (Q) and marks Qpc for perfect competition and Qmon for monopoly. The Y-axis represents Price, indicating Ppc for perfect competition and Pmon for monopoly pricing.

Several curves are shown: - MCpc (Marginal Cost in perfect competition) is a rising line, representing higher costs for smaller firms. - MCmon (Marginal Cost for monopoly) is lower and flatter, indicating lower costs due to economies of scale.

The intersection of the Demand/AR curve and the Marginal Revenue (MR) curve determines the monopoly's optimal output and pricing. The diagram shows that a monopoly achieves economies of scale by operating at a larger output, producing more at a lower price compared to perfect competition.

[Generated by AI]

Student view

As the monopoly firm is operating on a larger scale than the firm in perfect competition and is able to exploit economies of scale, the MC curve for the monopoly firm (MC_{mon}) is lower than the MC curve for the firm in perfect competition (MC_{pc}). This leads to a lower price being charged by the monopoly (P_{mon}) and a larger quantity of output being produced.

Natural monopolies

Another instance in which we may want to have just one firm operating in a market is called a natural monopoly. Some industries operate over a much broader range of output, for example a utilities firm, and it can make sense for a single company to operate. In the case of utilities, the firm needs to have a massive infrastructure in place in order to provide the good or service. Think about it: would you want to have more than one set of water pipes connected to your house, one for each different company?

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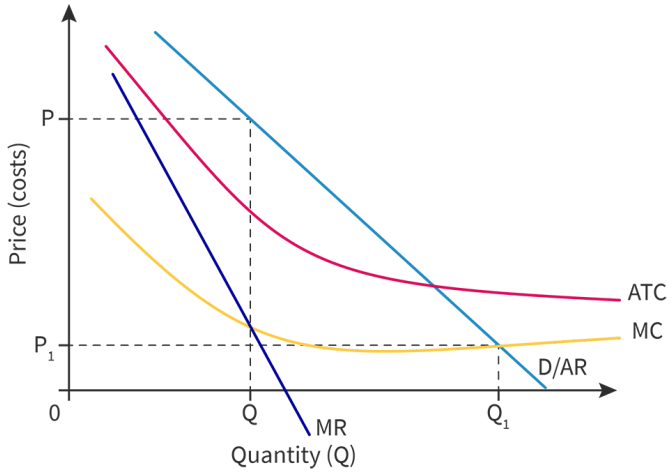

Figure 11. Potential outcome of a natural monopoly.

More information for figure 11

The diagram illustrates cost curves typical for a natural monopoly. The horizontal axis represents the quantity (Q), while the vertical axis shows costs and prices. There are several key curves displayed: a downward-sloping Average Total Cost (ATC) curve, a downward-sloping Marginal Cost (MC) curve, and a demand (D) curve. At higher levels of output, the ATC curve remains below the MC curve, indicating that increasing production significantly decreases average costs. The socially optimal quantity, Q1, is shown where the demand and marginal cost curves intersect, representing allocative efficiency. The position of the curves suggests that high fixed costs lead to a decrease in average and marginal costs over a broad range of output, showcasing the efficiency of a single-firm operation in this market.

[Generated by AI]

The diagram above shows one potential outcome of a natural monopoly. In this industry, the large fixed or set-up costs are significant and, for this reason, the ATC curve continues to decrease over a very large range of output. Whether it is the electricity grid for the country or perhaps the railway network, the socially optimal or allocatively efficient point will only occur when the scale of production is extremely large and the firm is operating at Q_1.

Student view

The reality is that a firm that does control this market is more likely to produce at Q, where profits are maximised, and charge a high price at P. The firm is unlikely to provide a comprehensive service to the whole country, especially if it means investing in the more remote and less profitable regions. However, it also does not make sense to have two or more firms producing this product, because they would each find it prohibitively expensive to finance the infrastructure, as well as it being a waste of resources for the country. For this reason, it can make sense to have a monopoly in certain types of market.

In the past, governments have often taken over these industries to ensure that economies of scale can be achieved and the whole country is covered by the network. The problem is that, although the socially optimal level of output can be produced, the firm may find itself operating at a loss, as the average cost of producing each unit is larger than the price charged at P_1. For this reason, in recent years, governments have needed to be creative to try to ensure that the market is not dominated by one firm and at the same time ensure that the price is closer to the social optimum. One way they have done this is by privatising the infrastructure and separating it from the operating companies.

For example, the rail network in the UK was privatised in the 1990s, with the infrastructure owned by a private company called Railtrack, which rented the tracks and stations to a number of newly-formed, competing train companies. The motivation behind it was primarily to privatise the companies but, because of the natural monopoly

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status of the railway network, it made sense to separate the infrastructure from the operators. For a variety of reasons, by 2002 Railtrack had ceased to exist and the network was taken over by a newly-formed government-owned company called Network Rail, but the basic natural monopoly principle remains.

Exam tip

There are a number of ways to draw the natural monopoly diagram, but to draw it well in the exam, it is helpful to draw the AC first and have it slope downwards almost all the way across your diagram and only rise towards the end of your *x* -axis. You will only be asked to explain what is meant by a natural monopoly and you will not be expected to evaluate the various outcomes, so keep it simple and stick to the diagram above.

Theory of Knowledge

In 1955 Jonas Salk developed a life saving vaccine for polio. It reduced the number of polio cases from 35 000 to 5600 by 1957 (http://en.wikipedia.org/wiki/Polio_vaccine). (https://en.wikipedia.org/wiki/Polio_vaccine)By 1961 only 161 cases were recorded in the United States. The vaccine was so effective because it was freely available and cheap. This is in contrast to many vaccines today that come to the market under patent. Pfizer produces PCV13, the current multi-strain pneumonia vaccine that is given to babies. The patent for PCV13 acts as a barrier to entry, giving Pfizer monopoly power over the production of the vaccine. Like all monopolies, Pfizer is a profit maximiser and charges hundreds of dollars for the vaccine.

Sadly, many families cannot afford the vaccine. More than 100 000 babies (https://www.business-standard.com/article/health/pneumonia-kills-one-child-every-39-seconds-127-000-died-in-india-2018-pneumonia-cause-data-119111300489_1.html) in India die from pneumonia every year. Each death would be preventable if the baby had been immunised.

Pfizer earns approximately USD 5 billion in revenue (https://www.axios.com/pfizer-vaccine-prevnar-top-selling-drug-161f7f05-c68e-4deb-93bb-c121664b7f15.html) for PCV13 each year.

Knowledge question: To what extent are monopolies obligated to act in an ethical manner?

Student view

3 section questions

2. Microeconomics / 2.11 Market failure — market power (HL)

Oligopoly

Section Student... (0/0) Feedback Print (/study/app/pp/sid-186-cid-754025/book/oligopoly-id-30954/print/) Assign

Characteristics

Oligopolies are usually not very competitive market structures, because only a few firms operate and there are high barriers to entry that prevent new entrants. Because each firm has a fairly large market share, they rely on each other for any gains or losses in their respective shares. In other words, when one firm gains more sales, it is always

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at the expense of the other firms. As a result, there is a very fierce rivalry between the firms and we say that they are interdependent. Because of this interdependence between firms, this particular market structure can produce some very interesting scenarios.

A simple game theory payoff matrix

One scenario that we can discuss is called the prisoner's dilemma. This is a simple game theory payoff matrix. It illustrates the strategic interdependence between firms. Oligopolistic firms find themselves in a difficult situation because their decisions have effects on each other. So which decision they make will depend on their own analysis of the possible outcomes, both for themselves and the other firms.

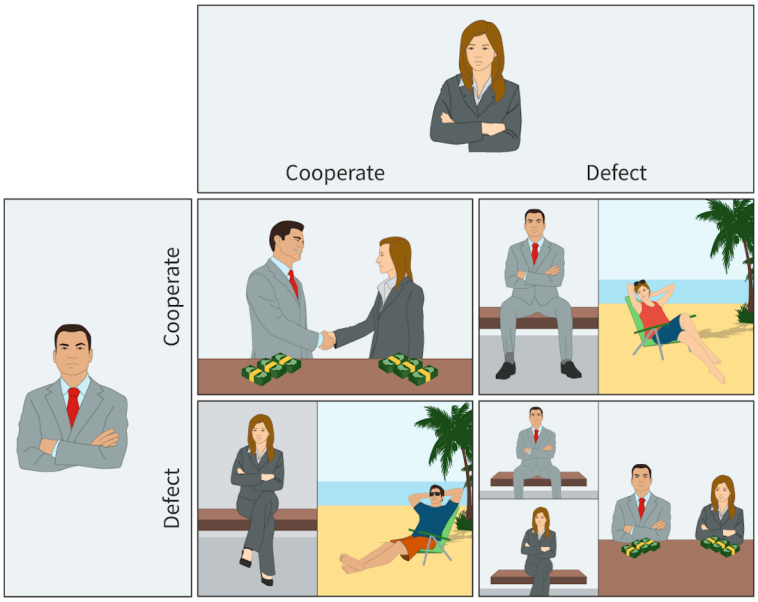

Figure 1. The prisoner's dilemma is a useful tool for understanding oligopolies

More information for figure 1

The prisoner's dilemma is a theoretical game that we can use to show that agents who are reliant on each other can benefit from thinking slightly differently in certain situations. Imagine two prisoners who are suspected of committing a crime together. They are interrogated in separate rooms. Would it be in their best interest to confess or not to confess? The results are shown in **Figure 2**.

Student view

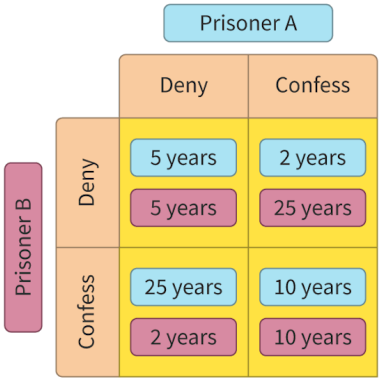

Figure 2. Acting in pure self-interest means both prisoners will confess, but is that the best outcome?

More information for figure 2

The image is a payoff matrix displaying the outcomes for the prisoner's dilemma scenario. It is structured as a 2x2 grid representing the choices and consequences for two prisoners, A and B, who can either confess or deny their involvement in a crime.

- The top header indicates 'Prisoner A' with two columns underneath labeled 'Deny' and 'Confess'.
- The side header indicates 'Prisoner B' with two rows going across labeled 'Deny' and 'Confess'.

Each cell in the matrix represents the years of imprisonment as a result of their decisions: - If both deny, both receive 5 years each. - If Prisoner A confesses while Prisoner B denies, A receives 2 years and B receives 25 years. - If Prisoner B confesses while Prisoner A denies, A receives 25 years and B receives 2 years. - If both confess, both receive 10 years each.

The matrix shows how acting in pure self-interest might not be the best mutual outcome for the prisoners.

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By confessing and assisting in the investigation, they may each get a lighter prison sentence. However, if prisoner A confesses and prisoner B does not, prisoner B will get a heavy sentence of 25 years. Prisoner A will get a lighter sentence of two years for helping. The same would be true in reverse. If they both confess by admitting to the crime, they get a higher sentence, of 10 years each, than if they had both denied it. Two confessions are sufficient evidence to convict both and there is no reason to reward one for helping.

Game theory provides a direct contradiction to Adam Smith's view that everyone acting in his or her own self-interest will result in the most efficient outcome for the market. In the prisoner example, if the prisoners acted in their own self-interest without considering each other, they would both confess. However, the best overall result for both of them would be if they both denied the crime. We have the American mathematician John Forbes Nash Jr. to thank for this contribution to economic theory.

Figure 3. The American mathematician and Nobel Prize winner, John Forbes Nash Jr. (1928—2015).

Instead of prisoners, let's imagine two supermarkets that are both considering launching expensive advertising campaigns featuring famous celebrities. **Figure 4** shows the possible impacts on their profits. Acting in self-interest alone means that the firms will both advertise, in the hope that the other firm does not. However, if they do, then consumers will probably not be able to decide between them and so there will be minimal impact on profits. Instead, firms should anticipate each other's behaviour and the better outcome would be not advertising to save themselves the cost of the ad campaign.

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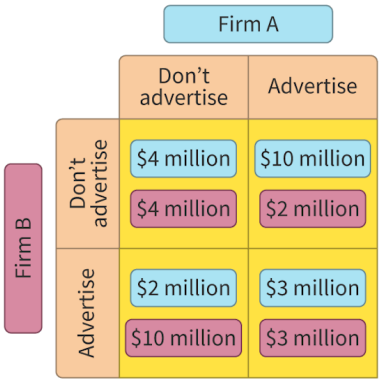

Figure 4. The prisoners' dilemma applied to business decisions.

More information for figure 4

The image is a payoff matrix illustrating the possible outcomes of advertising decisions for two firms, labeled Firm A and Firm B, in a business context. The matrix is structured as a 2x2 grid with each firm's strategies listed on the axes.

- Firm A's strategies are displayed horizontally at the top of the grid: "Don't advertise" and "Advertise."
- Firm B's strategies are displayed vertically on the left side: "Don't advertise" and "Advertise."

The grid cells contain the resulting profits depending on the choices made by each firm:

1. If both firms choose "Don't advertise," each firm earns $4 million.
2. If Firm A chooses "Don't advertise" and Firm B chooses "Advertise," Firm A earns $2 million and Firm B earns $10 million.
3. If Firm A chooses "Advertise" and Firm B chooses "Don't advertise," Firm A earns $10 million and Firm B earns $2 million.
4. If both firms choose "Advertise," each firm earns $3 million.

This matrix illustrates the typical prisoners' dilemma scenario, where mutual cooperation (not advertising) is better (higher combined profits) than individual maximizing strategies (advertising).

[Generated by AI]

Student view

Exam tip

It is extremely helpful to memorise a prisoner's dilemma example to be able to use in your exams. Draw out a table in pen and then fill in the values from memory with pencil. Erase the pencil and try it again. Revisit this exercise a few days later to check you have still remembered the values.

Collusion

This is another very interesting scenario that is possible under the conditions of an oligopoly. Because the risk of making the wrong decision in an oligopolistic market can be greater, there is an incentive for firms to work together, or **collude**.

Collusion between firms is usually an agreement to set the same prices. In most countries this practice is illegal, but it can be fairly difficult to prove. Recent examples of firms colluding include:

- The companies Heineken, Grolsch and Bavaria, together making up 95 per cent of the beer market in the Netherlands, were found guilty of price fixing in the 1990s and finally fined EUR 273.7 million in 2007.
- The perfume industry in France was found to be fixing prices between 1997 and 2000. One of the companies involved was L'Oréal, which had to pay a fine of EUR 4.1 million.

Groups of firms can also form a cartel. This is known as **open** or formal collusion. Cartels can be legal or illegal. A famous example of a legal cartel is the Organisation for Petroleum Exporting Countries (OPEC), an organisation of 14 countries that seeks to control oil prices by adjusting supply. A good example of an illegal cartel is the Unilever and Procter & Gamble cartel which was uncovered in 2011. They were fined EUR 315 million.

There is an incentive for firms to cheat in the cartel. With other firms in the agreement charging the agreed-upon price, one firm might lower its price, sell more and make more revenue.

Assuming that the government doesn't discover the cartel, there are a number of factors that will determine its success. The more firms that are operating in the cartel, the more difficult it is to ensure that all firms stick to the agreement. Other factors that threaten the stability of a cartel include:

- Cost differences between firms
- The market share enjoyed by the cartel
- The priority to survive during a recession
- Potential entry into the market
- The lack of a dominant firm
- Whether the objectives of firms in the cartel change

Collusion can also take place without a formal agreement between firms. This tends to occur when participants follow each other's or a dominant firm's pricing decisions. This is known as **tacit** or informal collusion. As with formal collusion, this is not in the interests of consumers. It prevents free market forces from operating correctly.

Price and output of the firm

Non-collusive oligopoly

Because of the existence of interdependence between firms, it is unlikely that firms will engage in price competition. The reason for this is that a decision by one firm to change its price will have consequences for the decisions of other firms. In the case of lowering prices, other firms will follow suit and also lower prices. This may lead to what economists call 'ruinous competition'.

Consequently, firms tend not to compete with each other on prices as the risk of a price war is too great. Instead, we tend to see large advertising campaigns, and other promotional activities like loyalty programmes. We call this non-price competition.

Collusive oligopoly

When firms collude, there is essentially no choice for consumers and consumer sovereignty fails to identify the better or cheaper option. It may as well be one firm operating in the market. Therefore, we draw a monopoly diagram to depict this situation.

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In a collusive oligopoly, the ultimate aim is to maximise profits for each participant. Firms will all set output deliberately lower, at the point where marginal revenue equals marginal cost. In **Figure 5**, this will be at output Q with the resulting price P. As we have discussed monopolies already, you know that this allows firms to earn high economic profits, but it is also deeply inefficient.

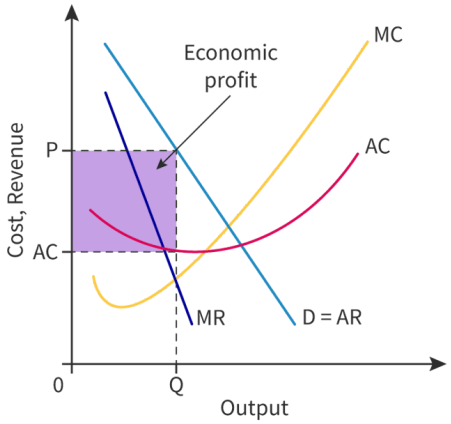

Figure 5. A collusive oligopoly is like a monopoly.

More information for figure 5

The image is a graph illustrating concepts of cost and revenue in a collusive oligopoly, similar to a monopoly. The x-axis represents Output, and the y-axis represents Cost and Revenue. Several curves are plotted on this graph: the Marginal Cost (MC) curve, the Average Cost (AC) curve, the Marginal Revenue (MR) curve, and the Demand or Average Revenue (D=AR) curve.

The Marginal Cost (MC) curve is shown as a positive slope, increasing as output rises. The Average Cost (AC) curve has a U-shape, initially declining, reaching a minimum, and then rising. The Demand or Average Revenue (D=AR) is a downward sloping curve showing that revenue decreases as output increases. The Marginal Revenue (MR) curve slopes downward steeply, indicating reductions in marginal revenue with increased output.

A shaded area labeled 'Economic profit' highlights the region of potential profits made by firms. The intersection of the MR and MC curves is marked as output 'Q,' and the corresponding price level on the demand curve is marked as 'P.' This price-output combination demonstrates a profit-maximizing condition in a collusive oligopoly where economic profits are maximized by equating marginal revenue with marginal cost.

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Student view

Identifying an oligopoly using concentration ratios

We define oligopolies as being markets dominated by a few large firms. How do we define a few, and what do we mean by dominate?

To work this out, economists use concentration ratios (CR). This measures what market share the biggest three, four or five firms have. If five or fewer firms together have a market share of more than 50 per cent , we can safely say the market is an oligopoly. If fewer firms achieve a market share of 50 per cent then it is an even less competitive market structure. If we see the five-firm market share increase then this also reduces competitive pressures. This market share can be measured by sales revenue or by the share of the total number of sales.

For example, if the CR_4 is 56 per cent then we know the four biggest firms have a share of 56 per cent. This market is definitely an oligopoly.

Worked example 1

a) Using the following sales revenue data, calculate the CR_3, CR_4 and CR_5 for this market:

Company	Sales revenue
A	GBP 22 million
B	GBP 19.7 million
C	GBP 18.3 million
D	GBP 16.5 million
E	GBP 11.8 million
F	GBP 8.7 million
G	GBP 6.9 million
Others	GBP 40.20 million

b) Outline whether this is an oligopoly.

a) First we need to add up all the revenue to know the size of the market:

GBP 22m + GBP 19.7m + GBP 18.3m + GBP 16.5m + GBP 11.8m + GBP 8.7m + GBP 6.9 + GBP 40.2m

= GBP 144.10m

CR_3 = ((GBP 22m + GBP 19.7m + GBP 18.3m) / GBP 144.1m) × 100

= (GBP 60m / GBP 144.1m) x 100

= 41.64%

CR_4 = ((GBP 22m + GBP 19.7m + GBP 18.3m + GBP 16.5m) / GBP 144.1m) × 100

= (GBP 76.50m / GBP 144.10m) x 100

= 53.09%

CR_5 = ((GBP 22m + GBP 19.7m + GBP 18.3m + GBP 16.5m + GBP 11.8) / GBP 144.1m) × 100

= (GBP 88.3m / GBP 144.1m) × 100

= 61.27%

Overview (/study/ap 186- cid- 754025/

b) Yes, this is definitely an oligopoly, because the four biggest firms have a market share of more than 50 per cent . The five-firm concentration ratio is 61.27 per cent .

2 section questions

2. Microeconomics / 2.11 Market failure — market power (HL)

Monopolistic competition

Section Student... (0/0) Feedback Print (/study/app/pp/sid-186-cid-754025/book/monopolistic-competition-id-30955/print/) Assign

Monopolistic competition is one of the two most realistic market structures that we study in theory of the firm. It is a very competitive market structure.

Figure 1. Branding is the determining feature in monopolistic competition.

Student view

Be aware

Monopolistic competition is not the same thing as a monopoly and, in fact, more closely resembles perfect competition than a monopoly.

Characteristics

A monopolistically competitive market structure is one in which there are many small firms, all selling similar, but slightly differentiated products. A good example of this type of market structure is clothing. This is a very competitive industry and the only thing that really differentiates, for example, different T-shirts from each other is their branding. Entry to the industry is fairly easy.

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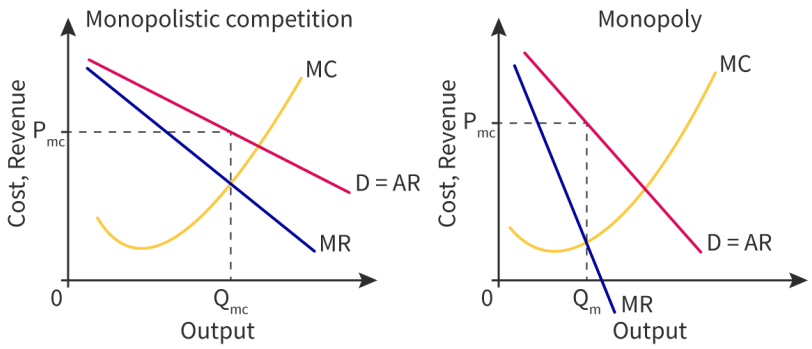

Figure 2. A monopolistically competitive firm has a shallower demand curve than a monopoly.

More information for figure 2

The image features two side-by-side graphs illustrating demand curves in a monopolistic competition on the left and a monopoly on the right.\n\nIn the monopolistic competition graph (left):\n- The X-axis is labeled 'Output' and the Y-axis is labeled 'Cost, Revenue'.\n- Curves included are the Marginal Cost (MC), Demand = Average Revenue (D=AR), and Marginal Revenue (MR).\n- The MC curve is upward sloping, the D=AR curve is slightly less steep and downward sloping, while the MR curve is steeper and also downward sloping.\n- There is a dotted line indicating the price (P_mc) intersecting the demand curve at a specific output level (Q_mc).\n\nIn the monopoly graph (right):\n- The X-axis is labeled 'Output' and the Y-axis is labeled 'Cost, Revenue'.\n- Similar curves are depicted: MC, D=AR, and MR, but with differing slopes.\n- The MC curve is upward sloping, the D=AR is more steeply downward sloping, and the MR curve is steeper than the D=AR and downward sloping.\n- Another dotted line marks a lower price (P_m) at a smaller output (Q_m) compared to the left graph.\n\nBoth graphs illustrate how the demand curve in monopolistic competition is less steep than in a monopoly, indicating greater price elasticity due to the availability of substitutes in monopolistic competition.

[Generated by AI]

Branding means that firms in monopolistic competition face a downward sloping demand curve. Unlike firms in perfect competition, which are price-takers, firms in monopolistic competition have some influence over their prices, so they are price-setters. Even though you can buy your clothes from any retailer, some of us may have a preference for a particular brand. **Figure 2** shows the monopolistically competitive firm's demand curve. It is fairly price elastic because of the substitutability of goods.

Student view

Important

The characteristics of monopolistic competition are:

- There are many small firms.
- Goods are similar and slightly differentiated.
- Each firm has some ability to set the price.
- There are low barriers to entry.

Price and output of the firm

You will have noticed that the diagram for a monopolistically competitive firm is very similar to a monopoly diagram. The only exception is that the demand curve is less steep. This shows that the firm has some power over its price because of brand loyalty, but less power than a monopoly due to the availability of substitute goods.

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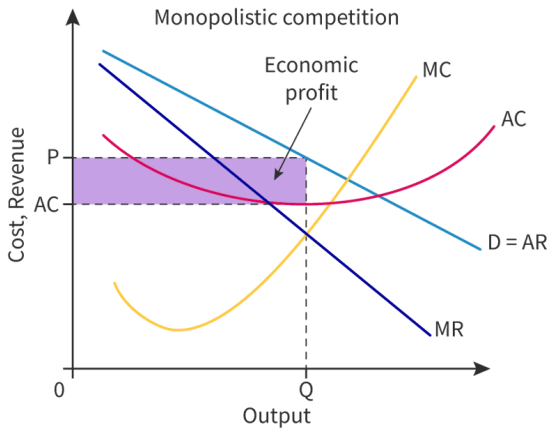

Figure 3. It is possible for a monopolistically competitive firm to earn economic profits.

More information for figure 3

The graph illustrates a monopolistically competitive firm's cost and revenue structure. The X-axis represents 'Output' while the Y-axis represents 'Cost, Revenue'. The graph includes curves labeled 'MC' for marginal cost, 'AC' for average cost, 'MR' for marginal revenue, and 'D = AR' which stands for demand equals average revenue. The lines intersect at various points with a highlighted area marked as 'Economic profit'. The 'MC' curve is upward sloping, while 'AC' is U-shaped. The 'MR' curve slopes downward, and 'D = AR' is less steep, allowing for some price-setting power due to brand loyalty. The gray dashed line shows the profit-maximizing output level marked as 'Q', with a price 'P' where the demand curve meets the output line. The shaded area between 'P' and 'AC' above 'Q' represents the economic profit for the firm.

[Generated by AI]

The profit-maximising firm will produce at the point where marginal revenue equals marginal costs, indicated by output Q in **Figure 3**. This gives a price along the demand curve of P, which is much higher than the average cost of production. The result is economic profit represented by the shaded area. However, as monopolistic competition is a very competitive market structure, this will only persist in the short run. This applet shows how price affects economic profit in this situation.

Student view

Interactive 1. Affect of Price on Economic Profit.

More information for interactive 1

An interactive line graph allows users to explore the relationship between cost, revenue, and profit in a market setting. Users can manipulate price variables to observe how changes in marginal cost (MC), average total cost (ATC), demand (D = AR), and marginal revenue (MR) affect a firm's profitability. The x-axis represents output, while the y-axis represents cost and revenue.

If the price increases, the demand and marginal revenue curves shift upwards, leading to higher potential profits if the price remains above ATC at the profit-maximizing output. If the price decreases, these curves shift downward, potentially resulting in losses if the price falls below ATC. Firms may adjust output accordingly to maximize profit or minimize losses. By analyzing the intersection of MR, MC, and ATC, users can understand profit maximization, break-even points, and losses. The interactive graph reinforces economic principles in pricing, competition, and cost management, offering insights into firm behavior in different market conditions.

Two scenarios illustrate monopoly outcomes: first, the firm maximizes profit by setting output where MR equals MC, with the price exceeding ATC, leading to positive profit shown by the green shaded area. In the second, the firm incurs losses as the price falls below ATC, shown by the red-shaded area. This situation may result from high costs or weak demand, prompting firms to cut costs or reduce output.

These cases highlight that monopolies do not always guarantee profitability. Market demand, cost structures, and pricing strategies determine financial outcomes. The interactive tool allows users to experiment with cost and revenue shifts, enhancing their understanding of real-world economic decision-making.

In the long run, the situation behaves a little more like perfect competition. When economic profits are earned, there is an incentive for new firms to join the market and there are also few barriers to entry. This means that many firms are likely to join the market, so an individual firm's demand will fall. Looking at **Figure 4**, we can see this happening by comparing the diagram on the left (depicting the short run) to the diagram on the right (depicting the long run). Both the price and output of the firm are lower in the diagram on the right. In addition, only normal profit is earned in the long run as P = AC.

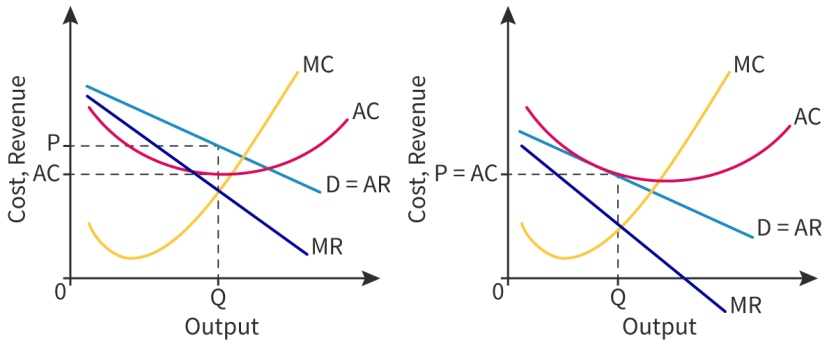

Figure 4. Economic profits are competed away in the long run and firms earn normal profit.

More information for figure 4

The image features two economic diagrams side by side, comparing the short run and long run conditions for a firm. Both diagrams plot 'Cost, Revenue' on the vertical axis and 'Output' on the horizontal axis. The left diagram, representing the short run, includes several curves: a downward sloping Marginal Revenue (MR) curve, a downward sloping Demand (D) or Average Revenue (AR) curve, and two upward sloping curves - the Marginal Cost (MC) and Average Cost (AC) curves. The equilibrium position, where price (P) equals the output (Q), intersects where the MR and MC curves meet. Here, P is above the AC curve, indicating economic profits. In the right diagram, representing the long run, the D=AR curve shifts down, with both MC and AC curves intersecting at the new equilibrium where P=AC, indicating only normal profits. The arrangement of curves visually depicts how economic profits are competed away over time as new firms enter the market, highlighting the transition from short-run to long-run equilibriums in a competitive market.

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Student view

Overview (/study/ap 186- cid- 754025/

Firms can also earn losses in monopolistic competition and will leave the market. **Figure 5** shows a monopolistically competitive firm making a loss, where the demand and MR curves lie below the average costs curve.

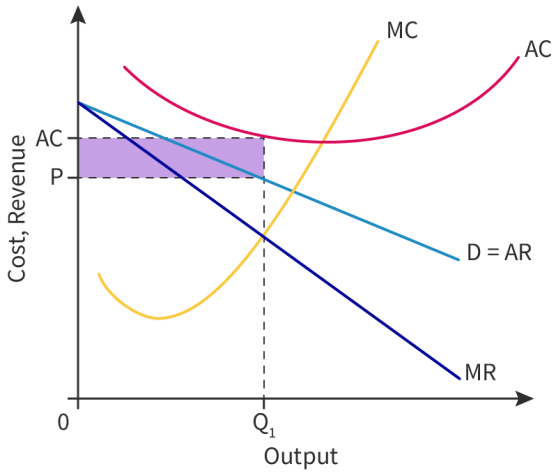

Figure 5. A monopolistically competitive firm earning losses.

More information for figure 5

The graph depicts a monopolistically competitive firm experiencing losses. The X-axis represents output, while the Y-axis is labeled as cost and revenue. There are several curves:

- The demand curve (D = AR) slopes downward from left to right.
- The marginal cost curve (MC) is upward sloping.
- The average cost curve (AC) is a U-shaped curve.
- The marginal revenue curve (MR) slopes downwards, lying below the demand curve.

The intersection between the MR and MC curves defines the profit-maximizing quantity, Q1. At this quantity, the price (P), determined by the demand curve, is below the average cost (AC), indicating a loss, represented by the shaded area.

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Student view

A consequence of the competitive nature of monopolistic markets is that the firms will engage in non-price competition. The greater the perception by consumers that the product is unique, the more loyal they will be to the brand. Firms will use advertising, product development, packaging and enhancements to the quality of service as methods to improve their brand identity.

Productive efficiency

Be aware

Please note that while the syllabus does not mandate the study of Productive and Allocative efficiencies, these concepts can greatly enhance your ability to compare the merits and drawbacks of various market structures, including Perfect Competition, Monopolistic Competition, and Monopoly.

Overview (/study/ap 186- cid- 754025/

Like a monopoly, a monopolistically competitive firm is not productively efficient. Even though the market is very competitive, the firm retains brand loyalty among its customers. In effect, customers who are strongly brand loyal don't have an alternative product to turn to, which is very much like a monopoly. If a firm has a high level of brand loyalty, to some degree they can relax in terms of being more efficient.

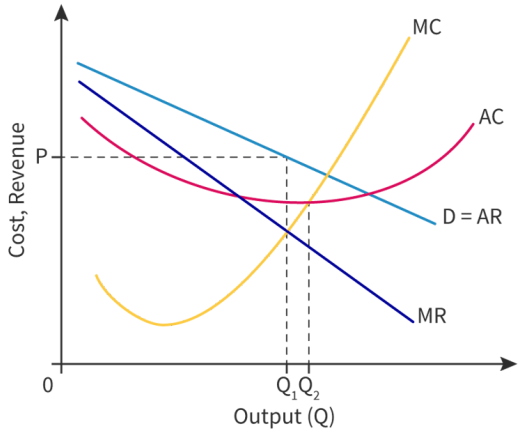

Figure 6. A monopolistically competitive firm is not productively efficient in the short run.

More information for figure 6

This graph illustrates the cost and revenue structure of a monopolistically competitive firm. The X-axis represents Output (Q) and includes points Q1 and Q2. The Y-axis represents Cost and Revenue, marked P at a certain level. Several curves are present on the graph: the MC (Marginal Cost) curve is U-shaped, the AC (Average Cost) curve is above it and also U-shaped, the MR (Marginal Revenue) curve is downward sloping, and the D=AR (Demand equals Average Revenue) curve is a straight line sloping downwards. At output Q1, the firm maximizes profit, while at Q2, it achieves greater productive efficiency.

[Generated by AI]

Figure 6 illustrates the comparison between the profit-maximising level of output and the output a firm would produce if it were being productively efficient. The firm will make profit at output Q_1 but the firm would be more efficient if it produced at lower cost at output Q_2. **Figure 7** shows the monopolistically competitive firm in the long run. You can see that the firm is not productively efficient in this situation either.

Student view

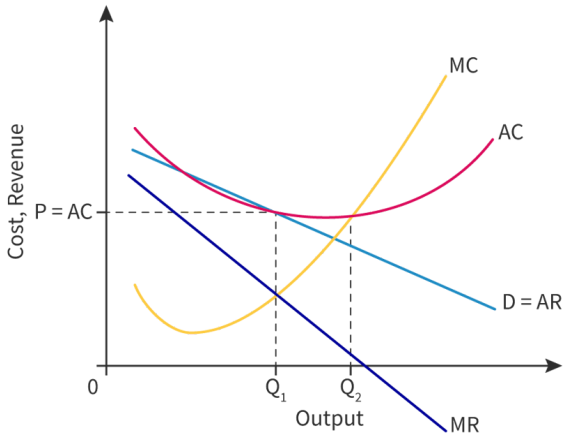

Figure 7. A monopolistically competitive firm is not productively efficient in the long run.

More information for figure 7

The graph represents the cost and revenue for a monopolistically competitive firm over different levels of output. The X-axis represents output, while the Y-axis represents cost and revenue. The key curves depicted are:

- MC (Marginal Cost): An upward-sloping curve passing through Q1 and Q2.
- AC (Average Cost): U-shaped and intersects the Y-axis above P=AC.
- D=AR (Demand = Average Revenue): A downward-sloping curve to the right.
- MR (Marginal Revenue): Downward sloping but steeper than D=AR.

Output level Q1 is the profit-maximizing level, where MR = MC, while Q2 represents the productively efficient level of output, at the minimum point of the AC curve. At output Q1, price equals average cost, indicating zero economic profit, but the firm is not operating at minimum average cost, showcasing inefficiencies.

[Generated by AI]

Allocative efficiency

Sadly, a monopolistically competitive firm is not allocatively efficient either. Like a monopoly, the firm can restrict supply to the market because consumers are brand loyal and willing to pay slightly more for the good or service. It means the firm can extract some of the consumer surplus as abnormal or economic profit. **Figure 8** shows the profit-maximising level of output at Q_1 and the allocatively efficient level of output at Q_2 in the short run.

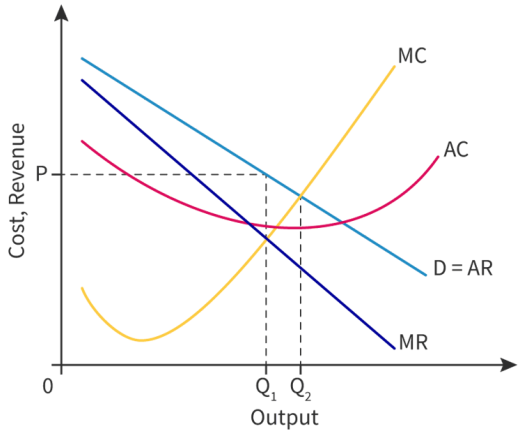

Figure 8. A monopolistically competitive firm is not allocatively efficient in the short run.

More information for figure 8

The graph illustrates a monopolistically competitive firm's short run. The X-axis represents output, marked at points Q1 and Q2, while the Y-axis represents cost and revenue, showing point P.

There are several curves on the graph:

1. MC (Marginal Cost): An upward-sloping curve that intersects with the MR curve.
2. AC (Average Cost): A U-shaped curve that intersects with the D=AR curve.
3. D=AR (Demand = Average Revenue): A downward-sloping curve that represents the firm's demand and intersects with the AC and MR curves.
4. MR (Marginal Revenue): A downward-sloping curve beneath the D=AR.

Overview (/study/ap 186- cid- 754025/

The graph demonstrates that the firm's profit-maximizing level of output is at Q1, while the allocatively efficient level of output is at Q2. These curves and intersections illustrate the firm's position regarding allocative efficiency and consumer surplus extraction in the short run.

[Generated by AI]

In the long run, the firm is not allocatively efficient either. The profit-maximising output at Q_1 allows the firm to break even and earn zero economic profits. The socially optimal point would be where average revenue or demand equals marginal cost at Q_2.

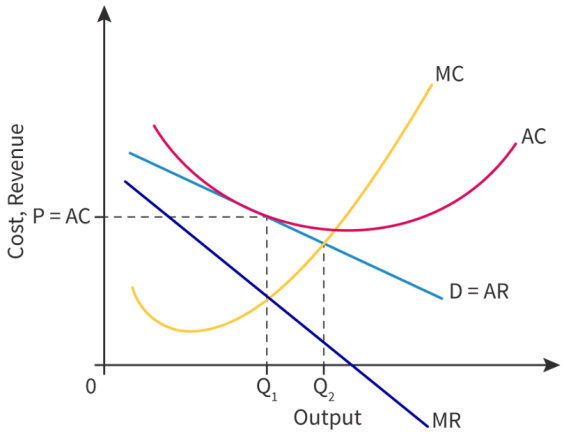

Figure 9. A monopolistically competitive firm is not allocatively efficient in the long run.

More information for figure 9

The image is a graph illustrating various economic curves in a monopolistically competitive market in the long run. The X-axis represents Output, with marked points Q1 and Q2, and the Y-axis represents Cost and Revenue. Several lines are present in the graph: \n- A downward-sloping blue line labeled 'MR' (Marginal Revenue) \n- A downward-sloping light blue line labeled 'D=AR' (Demand equals Average Revenue) \n- A U-shaped pink line labeled 'AC' (Average Cost) \n- A roughly U-shaped yellow line labeled 'MC' (Marginal Cost)\nThe MR and D=AR lines intersect towards the left of the graph near Q1, indicating the profit-maximizing output level where the firm breaks even, earning zero economic profits. The point Q2 further to the right on the X-axis represents the socially optimal output, where average revenue equals marginal cost. The graph visually conveys the idea that the firm does not achieve allocative efficiency in the long run.

[Generated by AI]

Student view

Evaluation of monopolistic competition

To be able to evaluate monopolistic competition, we need to compare it with other market structures. It may seem like the only positive market structure is perfect competition and to a certain extent, this is true. **Figure 10** illustrates that only perfect competition is both allocatively and productively efficient, while monopolies and monopolistic competition are neither. The second and third diagram both show the profit maximising levels of output, Q_m and Q_{mc}, being lower than the socially optimal levels, Q_{so}.

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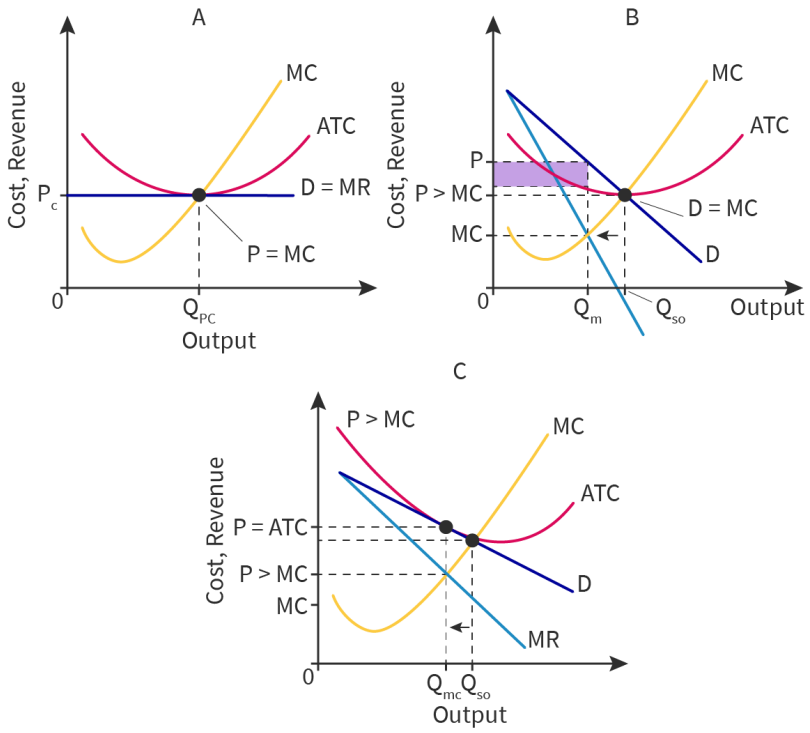

Figure 10. Comparing perfect competition, monopoly and monopolistic competition.

More information for figure 10

This image contains three economic diagrams labeled A, B, and C. Each diagram plots Cost and Revenue on the Y-axis against Output on the X-axis.

Diagram A represents perfect competition. The curves shown are Marginal Cost (MC), Average Total Cost (ATC), Demand (D) which equals Marginal Revenue (MR), and a price line represented as P = MC. The point where P = MC intersects the D = MR line shows the profit-maximizing output, labeled as Q_PC.

Diagram B depicts a monopoly. It includes MC, ATC, the demand curve (D), and the marginal revenue curve (MR). The price is set above Marginal Cost, indicated by P > MC. The profit-maximizing output and price points are shown as Q_m and a higher price level. The socially optimal output level is indicated as Q_so.

Diagram C illustrates monopolistic competition. Similar to B, it includes MC, ATC, D, and MR curves. The price set above MC is again noted as P > MC, with Q_mc as the profit-maximizing output and Q_so as the socially optimal output. The price points are marked, showing differences in price levels between profit-maximizing and competitive outcomes.

[Generated by AI]

Student view

It is important to recognise the reality of competition. No participant in any market has perfect information about prices, outputs, quality and so on. Think about it: are you really going to travel the length and breadth of the country to find the best deal?

Does that make monopolistic competition an undesirable market structure? In the real world it is the most competitive market structure that we have. Government legislation helps to improve our access to information about products, and the internet's price comparison and review websites also help us to make our decisions.

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Table 1. Summary table of market structures.

	Perfect competition	Monopoly	Monopolistic competition
Price	Lower at ATC	High	High in short run Lower in long run
Choice	Large choice	No choice	Large choice
Output	Smaller output per firm	Less output than allocatively efficient	Less output than allocatively efficient
Allocative efficiency	Yes	Never	Never
Productive efficiency	No in short run Yes in long run	Never	Never

3 section questions

Government intervention in response to market power abuse

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Student view

Most of the time, firms operate without the need for intervention. Indeed, some markets with little competition even provide some benefits that governments will want to allow to continue. These benefits include lower prices thanks to the lower costs gained from economies of scale, and the opportunities that arise from the research and development that firms with monopoly power can afford to undertake.

However, firms with monopoly power can also take advantage of their position by setting higher prices and restricting choice to consumers. Allowing monopolies to operate unchecked is a risk governments may want to manage.

Governments may try to solve the market failure by ensuring that competitive conditions prevail in markets. They can use:

- Legislation
- Regulation
- Nationalisation

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Legislation

Governments may legislate to prevent monopoly powers from forming. For example, they can prohibit takeovers or mergers of firms that would give one individual firm more than a certain percentage of the market share. They may also pass laws that restrict the market share that the largest firms of an oligopoly can have. For example, a government may rule that the four largest firms of an oligopoly cannot control more than 60 per cent of the market.

Figure 1. ExxonMobil formed in 1999 as a result of a merger between Exxon (formerly the Standard Oil Company of New Jersey) and Mobil (formerly the Standard Oil Company of New York). Some measures had to be taken before the merger was approved by regulators.

Regulation

Governments can set up regulatory 'anti-monopoly commissions' to investigate markets and ensure that monopoly power is not being used against public interests. These can be industry specific (for example, just for telecoms, energy or transport) or set up to deal with competition issues in any industry. Regulation can involve:

Student view

- A process of licensing
- Setting of standards
- Inspections
- The issuing of fines

Examples of regulatory bodies	Country
Telecom Regulatory Authority	India
Competition and Markets Authority	United Kingdom
The Federal Trade Commission’s Bureau of Competition	United States
EU Competition Commission	European Union
Competition Authority of Kenya	Kenya

For example, rail regulators will check the safety records of rail operators to make sure they are not cutting spending on passenger safety to increase their profits. A government can fine firms found guilty of such practices, or even break up larger firms into smaller ones to reduce the power they have.

Case study

Supermarkets in Thailand

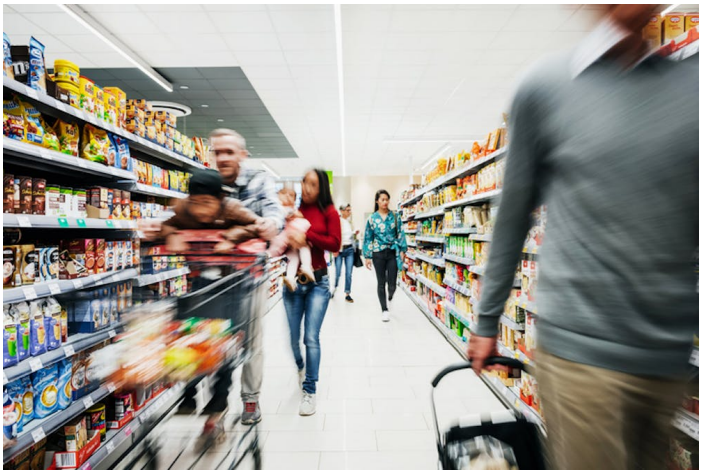

Figure 2. In many countries, the supermarket industry is an example of an oligopoly.
Credit: Getty Images Tom Werner

Tesco is planning to sell its 2000 super- and hypermarket outlets in Thailand. One company, CP Group, has offered USD 10 billion for the acquisition. CP Group owns the popular chain of small convenience shops called 7-Eleven, of which there are 12 000 in Thailand. The other companies vying for the chance to buy the supermarkets are Thailand's biggest supermarket operator and a leading beer company.

Thailand's government has recently set up an independent regulatory authority to oversee competition, called the Office of Trade Competition Commission. There is a concern that this acquisition will disrupt the competitiveness of this industry. Since 2006, and the ousting of Thaksin Shinawatra, the prime minister at the time and a business tycoon, there has been increased public awareness and scrutiny of this issue.

CP Group claims that this will create 'a complementary retail business ... and enable the company to operate a wider range of outlets.'

Student view

In Thailand, a committee must review any proposed merger that potentially threatens competition. Market dominance in the country is defined as a market share of over 50 per cent, or over 75 per cent when 'combined with two peers'.

Source: Adapted from CP's Tesco buy could be bitten by new antitrust watchdog (https://www.bangkokpost.com/business/1875004/cps-tesco-buy-could-be-bitten-by-new-antitrust-watchdog), The Bangkok Post.

Questions to consider:

- Based on your reading of this case study, do you think this merger should go ahead?
- Is there any information missing from this article that would help you make a better decision?

Nationalisation

A government may take control of a private sector industry in order to run it as part of the public sector for the best interests of the public. This is known as nationalisation.