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2. Microeconomics / 2.7 Role of government in microeconomics

The big picture

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

Since the beginning of the Industrial Revolution, the market system has provided significant
increases in wealth, health and prosperity. Before 1850, more than 80 per cent of the global
population was considered to be in absolute poverty, but today that number is less than 10
per cent.

The free market is largely responsible for that change. The following video provides some
interesting thoughts on the progress we have made so far, and how we might proceed from
here.

Student
view

Where Do We Go From Here? | Rutger Bregman

Student
view

So far, we have studied basic market theory. Supply and demand interact to set prices and thereby allocate scarce economic resources. In theory, if market agents behave rationally, then the market will be allocatively efficient. Consumers get what they want or need, as long as they are willing and able to pay a price for it, and producers are rewarded for their efforts. Everyone is happy.

However, do all markets behave in a way that results in allocative efficiency and socially desirable outcomes for all?

Consider these examples:

- Food shortages
- Climate change
- Obesity
- Microplastic pollution
- Bisphenol A (BPA) toxicity in plastic food containers

In all of these examples, the market system has created outcomes that have consequences for broader society, rather than just for the consumers and producers of that good or service.

Sometimes it feels like the news is perpetually negative, and that the world has an endless number of problems to solve. That is partly true, but we do have mechanisms available to alter the behaviour of markets so that they are more closely aligned with society's needs, not just the needs of the market participants. Governments can intervene in the following ways:

- Price controls

- Indirect taxes
- Subsidies
- Direct provision of services
- Command and control regulation and legislation
- Consumer nudges

These methods of government intervention will be explored in greater detail in the coming pages, but only Higher level students are required to perform calculations for the methods, and to study consumer nudges.

🔑 Concept

Intervention

Markets are tremendous forces for innovation and prosperity, but they can also create problems that are difficult to manage without intervention. Markets can fail to be allocatively efficient, which means they do not allocate resources in a way that maximises the interests of participants or third parties.

When markets create problems beyond the transaction between buyers and sellers, the government can be justified to intervene using a variety of methods. Intervention can be strong, such as banning particular goods or services, or their production methods. Intervention can also be less strong, for example influencing prices of goods and services by using taxes, subsidies and price controls. Intervention can also take the form of gentle nudges to influence consumer behaviour towards positive outcomes.

What kind of intervention in markets do you favour?

2. Microeconomics / 2.7 Role of government in microeconomics

Why do governments intervene?

Section   Student... (0/0)   📣 Feedback   🖨 Print (/study/app/pp/sid-186-cid-754025/book/why-do-governments-intervene-id-31087/print/)   Assign

There are many reasons why governments want to intervene in markets and, depending on their political alignment, some may want drastically more intervention than others. The reasons include:

- To earn government revenue
- To support firms
- To support households on low incomes
- To influence the level of production
- To influence the level of consumption
- To correct market failure
- To promote equity

ⓘ **Exam tip**

A common exam question asks you to explain the reasons why a government might use a particular method of government intervention. You should memorise this list, and ensure that you are able to flesh out your response with well developed examples.

Earning government revenue

The first significant reason to tax the consumption of goods and services is to raise government revenue. Governments tax a variety of goods and services, with many countries employing a goods and services tax (GST) or a value added tax (VAT) to most goods and services.

Like any other tax, indirect taxes produce revenue for the government that can be used to finance government spending. Governments might use tax revenue to provide public goods and services, to invest in **infrastructure**, to improve education or to provide healthcare for the population of the country.

Governments run budgets and need sources of income to finance their projects and expenditures. Indirect tax is a source of income for the government.

Each time the government charges an indirect tax on a good or service, it collects a revenue equal to the tax charged per unit of the good sold multiplied by the quantity of goods sold. Therefore, collecting this revenue is often the reason for charging an indirect tax.

Table 1. Tax on goods and services as a share of tax collected for selected OECD countries in 2018 (Source: OECD ↗ (https://data.oecd.org/tax/tax-on-goods-and-services.htm)).

Country	Tax on goods and services as a percentage of tax collected in 2018 (%)
Austria	27.46
Belgium	24.37
Chile	53.28
Denmark	32.67
Germany	26.24
Israel	36.46
Luxembourg	24.05
Portugal	39.63
Turkey	40.48
United States	17.58

In addition to general sales taxes, governments also directly target certain goods or services. Goods like tobacco or petrol (gasoline) tend to have low price elasticity of demand, so the government knows that it can levy taxes on these goods and raise revenue without having too much impact on the size of the market.

According to the Institute for Fiscal Studies 🔗 (https://www.ifs.org.uk/uploads/gb/gb2016/gb2016ch9.pdf), the United Kingdom generated 7.2 per cent of its tax revenue from excise taxes on tobacco, fuel and alcohol in 2016. This is quite large compared to other countries. However, it has fallen over the last few decades. If the United Kingdom had maintained the indirect charges at the same level today as they were in 1978–9, it would have GBP 26 billion more than it does now.

Figure 1. Tourists claiming their VAT back at Bangkok airport. Depending on the country you visit, you can claim some or all of the VAT you paid back.
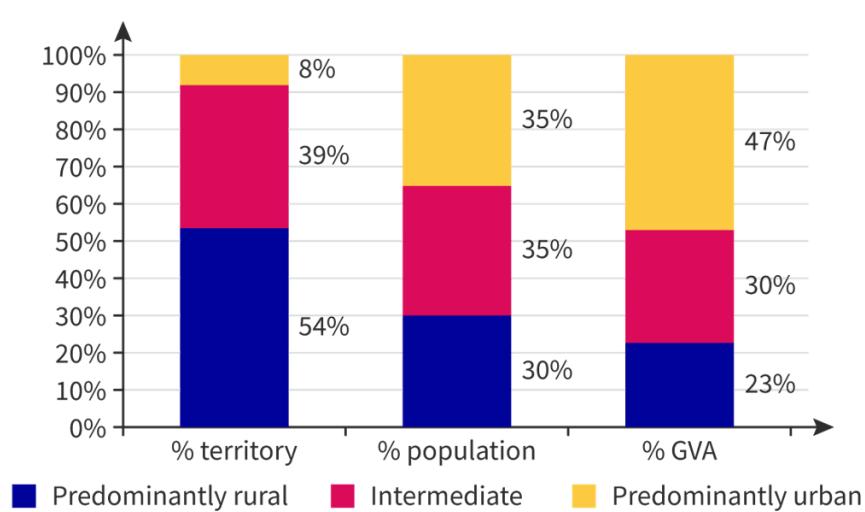
Credit: Getty Images Till JACKET

Supporting firms

Governments like to use methods of intervention to support firms in particular industries. This can be for economic reasons, but also for political and strategic reasons.

The Common Agricultural Policy (CAP) of the European Union supports farming in member states by providing 'direct payments' to farming sectors in order to help support jobs and growth, modernise the industry and improve sustainability. In economics, we call this kind of support a subsidy. For example, the CAP planned to invest about EUR 63 billion in France's farming sector and rural areas between 2014 and 2020 (European Commission, 2016 ☑ (http://www.fao.org/family-farming/detail/en/c/381489/)). To give you an idea of how important these payments are, the CAP subsidy was used to:

- support more than 22 000 young farmers.
- modernise over 30 000 farms.
- support more than 109 000 farms in less favoured areas (in mountain areas or with other natural constraints).
- Support more than 95 000 farms under the agri-environmental measures.

Source: " European Commission (https://ec.europa.eu/info/index_en) "

Figure 2. A graph showing the proportions of territory, population and gross value added employed by rural and urban regions of France.

👁 More information for figure 2

The image is a stacked bar chart representing the proportions of territory, population, and gross value added (GVA) by rural, intermediate, and urban regions in France. The X-axis depicts three categories: % territory, % population, and % GVA. The Y-axis ranges from 0% to 100%, measuring the percentage composition. The stacked bars are color-coded into three segments:

1. Predominantly rural (blue):

2. % Territory: 54%

3. % Population: 30%

4. % GVA: 23%

5. Intermediate (red):

6. % Territory: 39%

7. % Population: 35%

8. % GVA: 30%

9. Predominantly urban (yellow):

10. % Territory: 8%

11. % Population: 35%

12. % GVA: 47%

The chart shows that predominantly rural areas cover the majority of the territory, whereas predominantly urban regions contribute the most to the GVA.

[Generated by AI]

Supporting households on low incomes

Governments can also seek to support households in the country. Support can be targeted to certain households, or be universally applied. As an example, Indonesia has had fuel subsidies in place since the country gained its independence in 1949. They are primarily designed to support people on lower incomes to afford fuel for their cars, mopeds, and other fuel-reliant equipment. The Indonesian government plans to spend IDR 137.5 trillion (USD 9.7 billion) on energy subsidies in 2020, compared with the IDR 142.6 trillion it spent in 2019 (Jakarta Globe, 2019 ↗ (https://jakartaglobe.id/context/indonesia-plans-to-cut-energy-subsidies-by-34-next-year)). During the 1960s Indonesia's fuel subsidies cost the government more than 20 per cent of its annual budget.

These fuel subsidies are controversial because they do not improve sustainability in the country, particularly in the capital, Jakarta, which suffers badly from pollution. In addition, because the subsidy is universally applied, the wealthy, who have no problems paying for fuel for their luxury cars, also benefit from the lower fuel prices.

Influencing the level of production

Governments can use a number of methods to increase or decrease production of goods and services. In the case of undesirable goods, governments will often want to discourage their production, even though this will impact the businesses and employees in those industries. This is because the production of some goods can have negative effects on society.

Student
view

A good example of this is that many governments want to decrease the production of energy that uses fossil fuels. When energy is produced using natural gas, coal or petroleum, carbon dioxide is released into the atmosphere. This carbon dioxide pollutes the atmosphere, contributes to global climate change, and can create smog that affects the air quality of the local area. The Chinese government has acted in recent years to try to reduce the country's dependence on energy produced by coal-fired power plants by investing in clean energy and operating an emissions trading scheme.

Figure 3. In Shenyang, in China, the industrial area is located close to the city, causing poor air quality.

Credit: Getty Images Steffen Schnur

Influencing the level of consumption

Governments can use a variety of methods to increase or decrease consumption of goods and services. In the case of undesirable goods, governments will often want to discourage the consumption of them because it has negative consequences for those consuming as well as others in society. We call these kinds of goods demerit goods.

A good example of this is tobacco consumption. According to the World Health Organization ↗ (https://www.who.int/news-room/fact-sheets/detail/tobacco), an estimated 1.1 billion people consume tobacco in some form or another. Consumption of it is one of the leading causes of preventable death, and it kills approximately 8 million people every year. It can be strongly argued that the social costs associated with tobacco consumption outweigh the benefits of employment and profitability in that industry. For a long time, tobacco firms fought against government measures to reduce smoking, and often denied the health impacts of smoking. Many are now starting to produce heated tobacco products and e-cigarettes (which remain addictive and have negative effects on health as well) to retain their market share as consumers switch to these alternatives. Outside of Europe, they also continue to fight against government regulations. Governments have a range of effective measures to help reduce smoking, including **indirect taxes**, support programmes to help people quit and legislation, such as age restrictions, bans on tobacco advertising, and smoking bans.
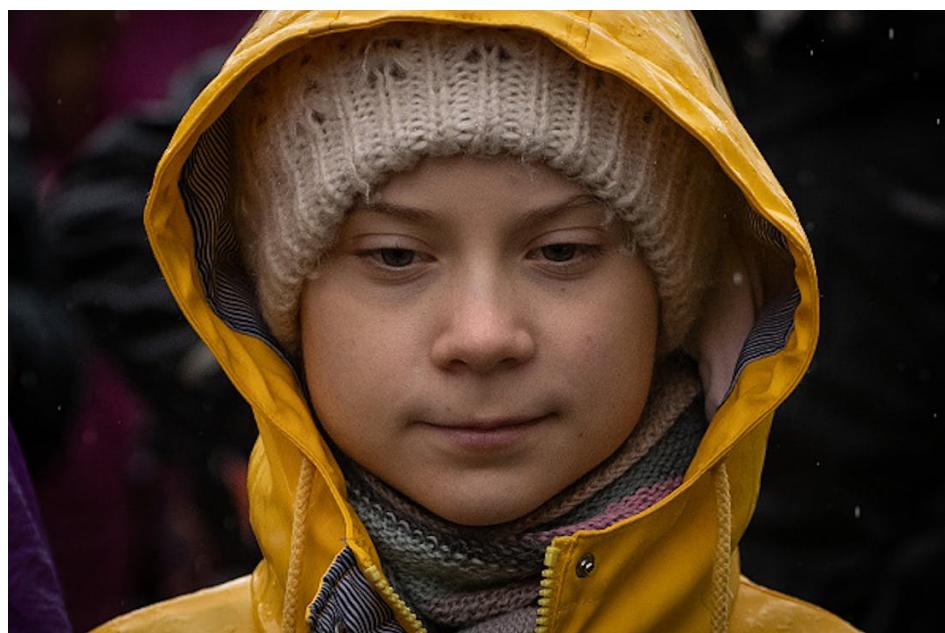
Correcting market failure

Market failure occurs when markets fail to allocate resources efficiently, and community surplus is not maximised. We will explore this concept in much greater detail later in this subtopic, but for now we can discuss a few basic ideas.

The most prominent example of market failure today is the issue of climate change. Climate change is an example of market failure because the firms and consumers responsible for the problems have not contributed sufficiently to the costs associated with climate change. We all continue to emit carbon through our production systems and from our homes and cars. Carbon emissions have not yet fallen, despite international attempts to reduce them, such as the Paris Agreement in 2015 ⤢ (https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement).

Figure 4. A 15 year-old Greta Thunberg when she started her School Strike for the climate by sitting outside Swedish Parliament in August 2018.

Credit: Getty Images Leon Neal / Staff

Governments can intervene to correct market failure by forcing producers and consumers to contribute financially (through taxes) to correcting the problem, or by legislating to reduce the harmful outputs over time. Governments can also improve the transparency and availability of information so that consumers can make better decisions about buying goods that might have a negative effect on the environment or that might be harmful to themselves and/or others.

🌐 **International Mindedness**

The problem of climate change requires us to think carefully about our impact on the globe. Some countries are significantly more responsible for climate change than others. Less economically developed countries want to achieve the same levels of economic prosperity that more economically developed countries, but at what cost to the environment? Should those countries be denied the opportunity to prosper to prevent any negative impact on the environment? How would a more sustainable route to development be cost-effective for a less economically developed country? The Paris Agreement was an attempt to bring countries together and make them collectively responsible for preventing climate change. How committed would you say we all are to this?

Promoting equity

Governments often choose to intervene in markets to improve the equity of the income distribution in the economy. We have already read about the fuel subsidies in Indonesia that aim to make fuel cheaper for low-income families.

The most common forms of government intervention to promote equity are found in health care and education. These are two services that are deemed to be human rights, and thus most governments try to offer these goods at no cost to the public. Many governments think that a child's ability to succeed in life should not be determined by their parents' income.

⚙️ **Activity**

For a country of your choosing (perhaps your home country or countries, or the place where you live), investigate the methods of government intervention that currently exist to promote a more equitable distribution of income. You can start with education and healthcare. Knowing lots of details about real world examples will help you in Paper 1, in which you must employ examples effectively to achieve a high score.

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5 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Price ceilings

Section   Student... (0/0)   📢 Feedback   🖨 Print   (/study/app/pp/sid-186-cid-
                                                                754025/book/price-ceilings-id-31088/print/)

Assign

The market price for a good or service is sometimes unaffordable. This is common for essential goods and services, such as rented accommodation or food. The government can set a maximum price, also known as a price ceiling, below the equilibrium price to prevent producers from selling their product above it. This is done to protect consumers and is usually applied to necessity and/or merit goods.
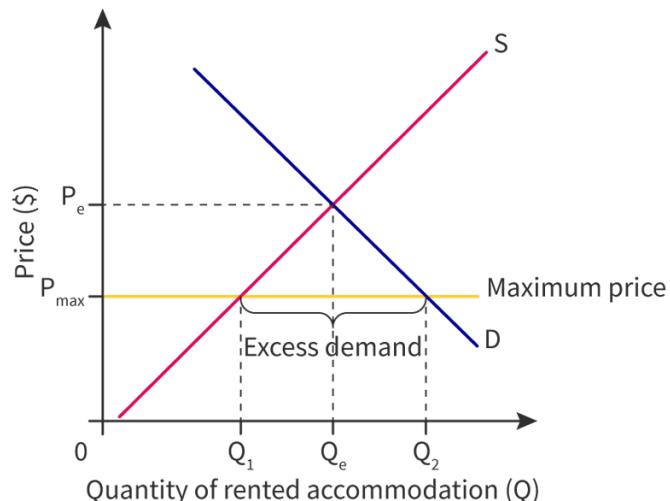
The aims of this policy are usually to:

- increase consumption of the good or service.
- reduce the price of certain goods or services for low-income consumers.
- prevent exploitation by monopolies (monopolies are covered in subtopic 2.11 (/study/app/pp/sid-186-cid-754025/book/monopoly-id-30953/)).

Two common situations where maximum price controls are used to ensure the availability of:

- low-cost food for low-income earners.
- affordable housing for low-income families.

As shown in **Figure 1**, with no government intervention, the rented accommodation market would be trading at a price of P_E and a quantity Q_E.

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Figure 1. Maximum price controls on rented accommodation.

More information for figure 1

The graph represents supply and demand curves for rented accommodation with a focus on maximum price control. The X-axis is labeled 'Quantity of rented accommodation (Q)' with marks at Q1, QE, and Q2, indicating different quantities including equilibrium. The Y-axis is labeled 'Price ($)', showing price points Pe (equilibrium price) and Pmax (maximum price).

The supply curve (S) slopes upwards from left to right, intersecting the demand curve (D) which slopes downwards. The intersection point of these curves represents the equilibrium price (Pe) and quantity (QE).

A horizontal line at Pmax, below the equilibrium price, indicates the maximum price set by the government. This line creates a gap between the supply and demand curves at that price level, labeled 'Excess demand', showing a shortage in the market where the demand exceeds supply at Pmax.

The text within the graph highlights the concepts of 'Maximum price' above the Pmax line and 'Excess demand' between the curves at this controlled price level.

[Generated by AI]

If the government set a maximum price on rented accommodation, it would be set below the equilibrium price at P_{max}, as shown in **Figure 1**. Cities like Berlin, Stockholm and New York currently employ price controls for rented accommodation.

At the lower price, consumers would now be willing and able to consume a greater amount, Q_2, while producers, on the other hand, would be willing and able to supply less, Q_1. This would create an excess of demand from Q_1 to Q_2 and the consumption of rented accommodation would actually fall to Q_1 even though those consumers would pay a lower price for them.

If the government does not intervene further, then the original policy objectives would not be achieved. The price has been reduced but only for those who get to consume the good. The amount consumed has *not increased* because of the maximum price, it has actually now *fallen*.

⊘ Exam tip

Students are often hesitant to use diagrams enough in their answers, and their responses are much less effective without them. We will be learning lots of diagrams in the following sections. Make sure you learn these diagrams well, and use them to support your explanations. They are an essential tool for your success in economics.

Read the case study box below about the food price controls that are currently in place in Venezuela. Analyse the effects that food price controls are having in that country. Are the government's policy aims being accomplished?

⊡ Case study

Food price controls in Venezuela

Video 1. Venezuela's Economy Teeters as Government Imposes Wage, Price Controls.

◉ More information for video 1

❌

Student
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Figure 2. Queues outside a supermarket in Venezuela, where the government has imposed price ceilings on food.
Credit: Getty Images John Moore / Staff

Starting in 2010, and continuing today, Venezuela has implemented several price controls on the food industry. These were implemented in an attempt to keep food prices under control in an economic climate in which hyperinflation was taking root, and falling consumer and investor confidence resulted in large depreciations of the bolivar (the Venezuelan currency). Because of the oil wealth accumulated during the 1990s, Venezuela started to import more food from abroad, which limits the country's ability to influence food prices.

Consider these questions:

- In what ways is this intervention resulting in an inefficient allocation of resources?

- Do you agree with the government's implementation of price controls in this case study?

- Would other methods of intervention have been more suitable?

⚠ **Be aware**

Maximum price or **price ceiling** is usually tricky for students, because it actually means '**low price**' for consumers and it is set **below the equilibrium price** of the market and not above.

Our brain tends to relate the words 'maximum' and 'ceiling' with the word 'above' and with the concept of 'high'. Be careful not to draw the price control line or price ceiling above the equilibrium in a maximum price control question.

Possible consequences of imposing a maximum price

A price ceiling may produce several consequences. Let us look at some of its possible outcomes and effects:

- It produces shortages.
- It generates a rationing problem.
- It promotes the creation of parallel (black) markets.
- It eliminates allocative efficiency and generates welfare loss.
- There are consequences for market stakeholders.

It produces shortages

At the price ceiling P_{max}, the quantity supplied, Q_1, is much lower than the quantity demanded, Q_2, therefore not all of the consumers who are willing and able to buy the good at that price will be able to do so. The reduction in quantity supplied is because producers cut production in response to the lower price, and a shortage of $Q_2 - Q_1$ is created.

If the price is kept at P_{max}, there will be a quantity Q_E demanded by the consumers who would have purchased the good at the previous price P_E, plus an additional quantity demanded by all of the new entrants to the market attracted by the low price, who will not have access to it now.

⚠ **Be aware**

One common mistake is to calculate the shortage using areas on a graph. The shortage is not an area but the distance between the quantity demanded and the quantity supplied at the set price.

It generates a rationing problem

As not all of the interested consumers will be able to purchase the good because of the generated shortage, the problem of who gets to consume the good and how to ration the available amount arises.

Because the price is no longer the method used to distribute the good, non-price rationing methods have to be used. These include:

- People line up and wait their turn to buy the good, and only those who arrive first will be able to do so.
- Coupons are distributed between the interested buyers so that they can purchase a fixed amount of the good in a given time period.

Sellers use favouritism to choose who they sell the good to; sellers can sell the good to their preferred clients.

It promotes the creation of parallel (black) markets

A parallel market, is a market where buying and selling transactions are unrecorded, and are usually illegal.

In this case, many consumers who were willing and able to purchase the good at a higher price than the one set by the government will not be able to purchase the good through the legal market because of the shortage produced by the maximum price. At the same time, many producers who could have sold more units of the good at a higher price than P_{max} before setting the price control will not be able to sell that higher amount through the legal market either.

This creates motivation for a black market for the good to emerge. Producers will try to sell the extra units at a higher price than P_{max} as there will be consumers willing to buy them. Then the real price for the product being sold and consumed would be somewhere between P_{max} and P_E. This means that governments would not accomplish either of the objectives of the maximum price control policy.
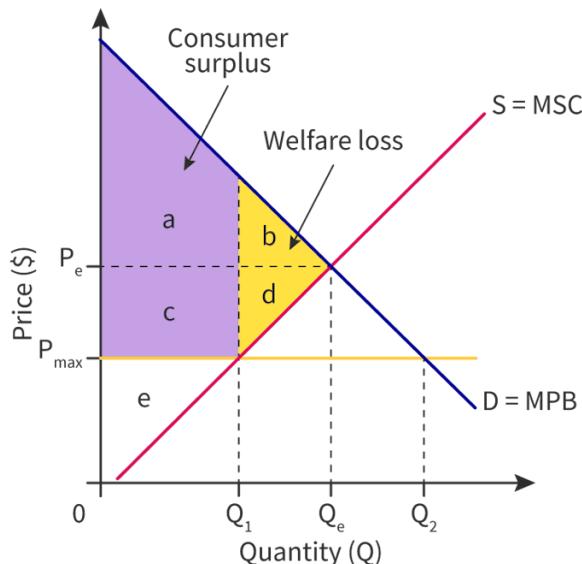
It eliminates allocative efficiency and generates welfare loss

As a smaller amount of the good is being produced and consumed (Q_1) than the socially optimal amount determined by market equilibrium (Q_E), there will be an under-allocation of resources to the production of the good from the society's point of view. This allocative inefficiency results in society being worse off.

Figure 3. Welfare loss because of maximum price controls.

👁 More information for figure 3

The graph illustrates the welfare loss due to maximum price controls, with axes labeled 'Price ($)' on the Y-axis and 'Quantity (Q)' on the X-axis. The demand curve (D=MPB) is downward sloping from the top left to the bottom right, and the supply curve (S=MSC) is upward sloping from the bottom left to the top right.

A horizontal line at price level P_max indicates maximum price controls. At market equilibrium, the price is P_e, and the quantity is Q_e. The consumer surplus is shown as the area labeled 'a,' above price P_e and below the demand curve. Below P_max, the areas 'c' and 'e' represent the producer surplus and loss due to price controls, respectively.

The welfare loss, indicated as shaded areas 'b' and 'd,' occurs between quantities Q_1 and Q_2, where price controls lead to a lower quantity being supplied (Q_1) compared to the equilibrium quantity (Q_e). The intersection of Q_1 with the demand and supply curves represents the points of curtailed supply and demand under maximum price control.

[Generated by AI]

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As shown in **Figure 3,** with no price controls, the market equilibrium is at price P_E and quantity Q_E. Consumer surplus is equal to area A + B and producer surplus is equal to C + D + E.

When the price ceiling is set, consumers only consume the quantity Q_1, therefore the consumer surplus is area A + C (all of the area below the demand curve and above the price paid by consumers P_{max}, for the units consumed).

Producer surplus is now only E (all of the area above the supply curve and below the price received by producers, P_{max}, for the units sold).

The total community surplus after the maximum price control is set is the area A + C + E. By comparing this to the total social welfare before the maximum price, we can see that society suffers a deadweight loss of B + D, as shown by the shaded area in the diagram.

Consequences for market stakeholders

Although we have touched on the effects of enforcing a price ceiling on different stakeholders in the market, let us look at each stakeholder individually: consumers, producers, workers and government.

Consumers: Some consumers of the good are better off and some are worse off. Those who get to buy the good at a lower price than before are better off. Those who do not get to consume it at any price at all because of shortages or rationing are worse off.

Producers: Producers now sell a smaller amount of the good than before ($Q_1 < Q_e$) and receive a lower price for it. Their total revenue falls after the price ceiling is imposed, therefore they are worse off.

Workers: As the size of the market is reduced and fewer units of the good are sold, it is probable that workers will be fired in this market and unemployment will increase. Thus, those workers will be worse off.

Government: Government does not have a revenue or a cost from this specific policy. However, it may gain political popularity from those consumers who get to consume the good at a lower price than before.
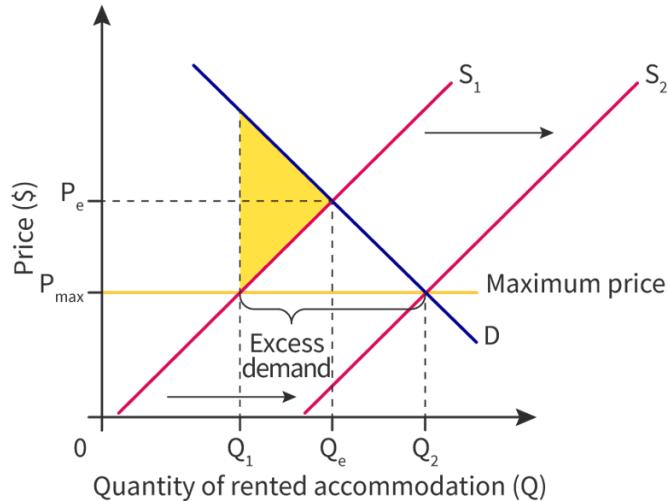
Solutions to maximum price control consequences

The basic problem created by the maximum price is the excess demand or shortage of the product in the market.

As the resulting market outcome does not accomplish the original objectives of the policy, and it is not fair to consumers, the government might attempt to intervene further by increasing the supply of the good until the equilibrium is reached at P_{max}.

This is shown in **Figure 4,** where more of the good is being produced and consumed at Q_2.

Figure 4. Further government intervention to sustain the maximum price.

   More information for figure 4

The image is a graph depicting a supply and demand curve in the context of a maximum price scenario. The X-axis is labeled "Quantity of rented accommodation (Q)", while the Y-axis is labeled "Price ($)". The graph shows two supply curves, S1 and S2, and a demand curve labeled D. A line representing the maximum price, labeled Pmax, is drawn horizontally across the graph. The equilibrium price, Pe, is indicated by a horizontal dashed line. Vertical lines at Q1 and Qe illustrate the quantity of goods related to the supply curves. An area between the maximum price line and the demand curve is labeled as "Excess demand". The supply curve shifts to the right from S1 to S2, demonstrating increased production and consumption at the new quantity Q2.

[Generated by AI]

There are three ways in which the government can do this. It can:

- grant subsidies to the producers to encourage them to increase supply by producing more of the good.
- increase supply by producing the shortfall quantity of the good itself to meet total demand.
- store some of the product (as long as it is not a perishable good) before setting the price ceiling, then increase supply when needed by releasing some of its stocks on to the

market.

In every case the supply curve will shift from S_1 to S_2 in **Figure 4,** eliminating the excess demand as a new equilibrium is reached at P_{max} and Q_2. Doing so would mean that both of the original objectives are accomplished:

- The quantity consumed of the good would increase from Q_e to Q_2.
- The price of the good is more accessible for low-income consumers, reducing it from P_e to P_{max}.

⚠   **Be aware**

> Although these solutions mean a lower price for all consumers, they also mean that the government incurs a cost, especially in the case of a subsidy. This will have an opportunity cost in terms of some other area in which the government may have to reduce expenditure.

Worked example 1

Suppose the government sets a maximum price on rented accommodation with the intention of increasing the number of families that rent a home, and at the same time reduces the price of rentals for low-income families.

1. What will be the effect on the people willing to rent properties to live in?

2. What will be the reaction of the property owners who have properties to rent?

3. What will be the combined effect of the answers to questions 1 and 2?

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Student
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4. Propose two solutions that could be implemented to solve the problem and achieve both objectives of the policy.

> 1. As the price of rented accommodation will fall below the equilibrium price in the market, more people will be willing and able to rent housing. Therefore, the quantity demanded of rented accommodation will increase.

2. Property owners, on the other hand, will be less willing to offer their properties for rent in the market because they will now earn a lower revenue from them. The supply of housing for rent in the market will fall in relation to the previous equilibrium quantity.

3. Both the increase in demand for rented accommodation and the fall in supply in the market will produce a shortage of accommodation (excess demand), at the maximum price set by the government.

4. There are two solutions that would allow the government to achieve both objectives of the policy:

a) The government could implement housing projects to construct the extra low-cost rental properties needed.

b) The government could subsidise private construction firms to increase the supply of low-cost accommodation.

Be aware that both solutions have a cost for the government and will bring an opportunity cost in terms of other expenditure cuts, or the government might incur a budget deficit.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Price floors

Section | Student... (0/0) | 📢 Feedback | 🖨 Print (/study/app/pp/sid-186-cid-754025/book/price-floors-id-31089/print/) | Assign

❌

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The situation for <u>minimum price controls</u> (price floors) is the opposite to maximum price controls. In this case, the government sets a minimum price **above** the equilibrium price, preventing producers from selling their product below it. This is done to **protect producers**, usually in the case of commodities and in the labour market.

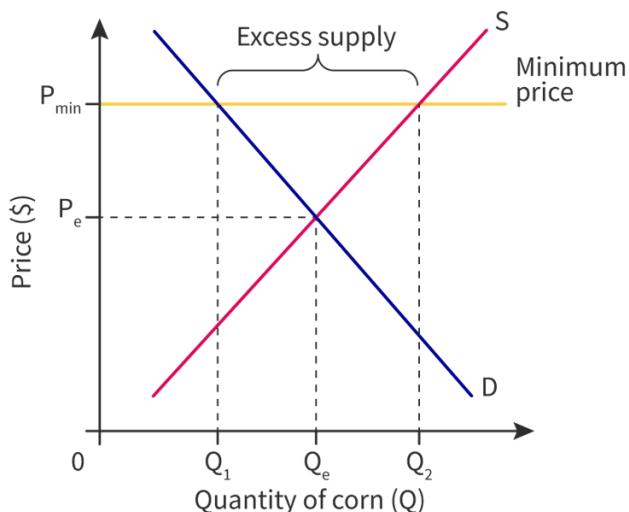Usually the aims of this policy for the government are:

- to increase the income of producers of goods and services that the government considers important, such as agricultural products, which are subject to large price fluctuations or great foreign competition.
- to protect workers, by setting a minimum wage that ensures they earn enough to have a reasonable standard of living.

Figure 1 shows the example of corn. With no government intervention, the market would be trading at a price of P_E and a quantity Q_E.

If the government set a minimum price on corn, it would be set above the equilibrium price at P_{min}, as shown in the diagram.

At the higher price, producers would be willing and able to supply a greater amount, Q_2, while consumers would be willing and able to buy less, Q_1. This would create an excess of supply from Q_1 to Q_2.

If the government does not intervene further, then the original policy objective of protecting producers of corn by increasing their revenue might not be achieved. The price has increased, but only for those who are still willing and able to consume the good at the higher price, so the quantity sold has fallen. Whether or not setting a minimum price will increase the producers' total revenue depends on which of the two effects – an increased price or decreased quantity demanded – has been stronger (this depends on the relative elasticity of demand).

Figure 1. Minimum price set on corn.

More information for figure 1

The graph represents the supply and demand dynamics for corn, showcasing the impact of setting a minimum price. The horizontal axis denotes the 'Quantity of corn (Q)' and extends from 0 to Q2, with marked points at Q1 and Qe, indicating equilibrium and other relevant quantities. The vertical axis represents 'Price ($)' with Pmin as the minimum price set above the equilibrium price Pe. There are two intersecting lines: the blue line labeled 'D' represents the demand curve, and the purple line labeled 'S' represents the supply curve. The intersection of these lines at (Qe, Pe) marks the equilibrium point. The yellow line at Pmin indicates the price floor set above the equilibrium price, causing the quantity supplied (Q2) to exceed the quantity demanded (Q1), leading to an excess supply. This is visually represented by the region between Q1 and Q2. Situated above the equilibrium price, the price floor results in a decrease in quantity sold, as fewer consumers are willing to purchase at the higher price, despite increased revenue per unit sold.

[Generated by AI]

⚠ Be aware

Again, this case is tricky for our brain, as the words 'minimum' and 'floor' are usually associated with the word 'below' and with the concept 'low'. However, **minimum price** or **price floor** means a **higher price** for producers, and it is set **above the equilibrium price** of the market and not below.

Possible consequences of imposing a minimum price

A price floor may produce several consequences. Let us analyse some of its possible outcomes and effects:

- It produces surpluses.
- It promotes the creation of black markets.
- The government needs to dispose of the surplus.
- It might create firm inefficiency.
- It eliminates allocative efficiency and generates welfare loss.
- There are consequences for market stakeholders.

Surpluses

Figure 1 shows that at the price floor, P_{min}, the quantity supplied, Q_2, is much higher than the quantity demanded, Q_1, therefore not all of the crop produced will be bought by consumers. Consumers will purchase less in response to the higher price and a surplus of $Q_2 - Q_1$ is created.

If the price is kept at P_{min}, there will be a quantity Q_E supplied by all the producers who would have produced the good at the previous price P_E, plus an additional quantity supplied by all of the new entrants to the market attracted by the high price, who will not be able to sell it anymore.

Informal (black) markets

If producers cannot sell all of their goods at the regulated price P_{min}, they may try to sell it at a lower price on the informal (or black) market. This practice is illegal and will go against the original objective of the policy by selling the good at a lower price nearer to the original equilibrium price.

Government must dispose of the surplus

As not all of the product will be sold to consumers, the problem of what to do with the surplus arises. One option is that the government purchases the excess supply, shifting the demand curve outwards, as shown in **Figure 2,** up to the new equilibrium quantity Q_2. This will generate a cost for the government.

Once it has bought the surplus, the government needs to decide what to do with it. The government can:
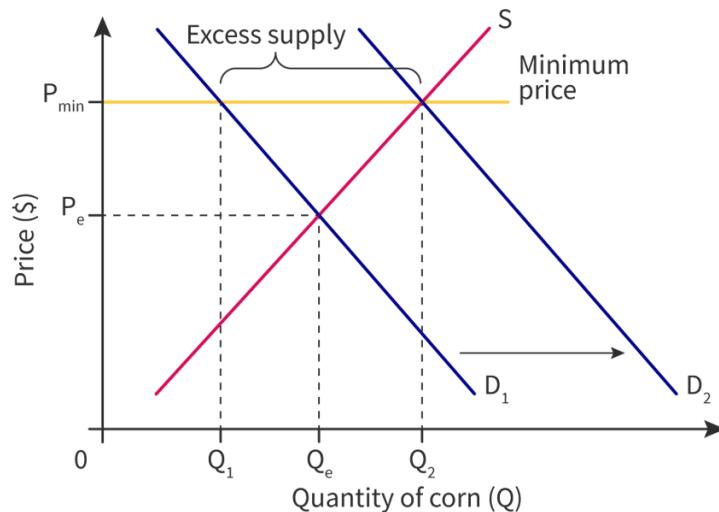
- store the good, which will generate additional costs.
- sell the surplus abroad (export). It may have to consider what price to sell it at, if it aims to make back the money spent buying the surplus initially and also ensure the price is competitive abroad. It would need to be careful to not be seen to 'dump' the surplus abroad and be accused of unfair trade practices.
- send the surplus as aid to developing countries, but this usually causes problems for these countries, by reducing the demand for locally produced goods and potentially damaging local businesses.
- burn the excess good, but burning food (as in this example) is seen as being extremely wasteful and unethical given that so many people in the world are starving.

Student
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Almost any action taken by the government to get rid of the surplus has costs and disadvantages.

Figure 2. Further government intervention to sustain the minimum price.

More information for figure 2

The image depicts a graph illustrating supply and demand for corn. The X-axis represents the quantity of corn (Q), and the Y-axis represents the price in dollars ($). The graph consists of the following components:

1. Two lines labeled S (Supply) and D (Demand), intersecting at a point labeled Qe (Equilibrium Quantity) and Pe (Equilibrium Price).

2. A horizontal line marking a minimum price, labeled as Pmin, which is above the equilibrium price.

3. The area between the supply line and the minimum price line is marked as "Excess supply," indicating a surplus.

4. Two quantities are marked on the X-axis: Q1 and Q2, with Qe in between them, showing the redistribution of supply and demand due to the price change.

5. Two demand curves, D1 and D2, are depicted, illustrating potential shifts in demand.

This diagram visually explains how a minimum price intervention causes a surplus in the market by maintaining a price floor above the market equilibrium.

[Generated by AI]

✓ **Important**

To avoid the problem of what to do with the surplus good and still protect producers by guaranteeing them a higher price for their total production, many countries decide to pay producers not to produce the excess. The unused resources, such as land, are then used to produce something else.

Firm inefficiency

If firms know they will receive a higher price no matter how inefficient they are in their production process, they will not be motivated to reduce costs and use more efficient methods of production.
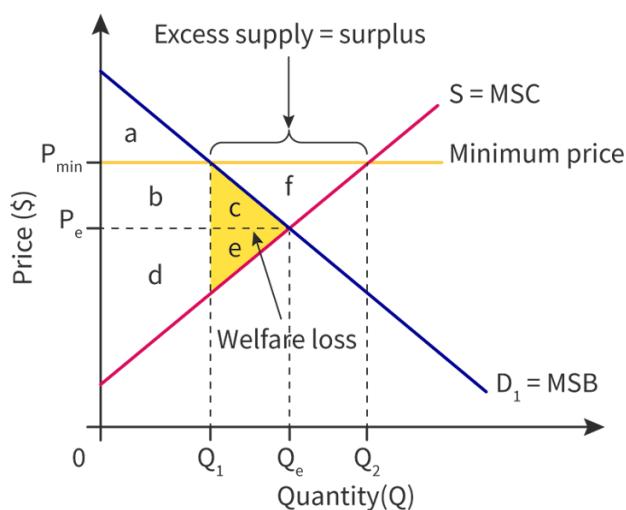
Higher prices than the equilibrium price may lead to production inefficiency, because the high prices protect the firms from lower-cost competitors.

Allocative inefficiency and welfare loss

As a greater amount of the good is produced, Q_2, than the socially optimal amount determined by the market equilibrium, Q_e, there is an over-allocation of resources to the production of the good from the society's point of view. Allocative inefficiency causes the society to be worse off.

As shown in **Figure 3,** with no price control the market equilibrium is set at the price P_e and the quantity Q_e. Consumer surplus is equal to area A + B + C and producer surplus is equal to D + E.

When the price floor is set, consumers only consume the quantity Q_1. Therefore, the consumer surplus is area A (all of the area below the demand curve and above the price paid by consumers, P_{min}, for the units consumed). With no further government intervention the welfare loss is C + E.

Figure 3. The impact of a price floor on community surplus.

More information for figure 3

The graph depicts the impact of a price floor on community surplus. It features two axes: the X-axis represents Quantity (Q) with labeled points Q1, Qe, and Q2, while the Y-axis represents Price ($) with marked levels Pmin and Pe. The graph includes two lines: a downward-sloping demand curve labeled D1 = MSB and an upward-sloping supply curve labeled S = MSC. A horizontal line indicates the Minimum price (Pmin). Areas labeled a, b, c, d, e, and f represent different sections of surplus and welfare loss.

- **Consumer Surplus:** Area A below the demand curve and above the price of Pmin for the quantity Q1.
- **Producer Surplus and Excess Supply:** Area f above the price level Pmin and below the supply curve.
- **Welfare Loss:** Triangular area labeled C + E, signifying losses due to the imposed price floor.

This graph illustrates how the implementation of a price floor affects the quantity traded (reduced to Q1), resulting in a surplus (area f) and welfare loss (C + E) due to a reduction in community surplus and consumption.
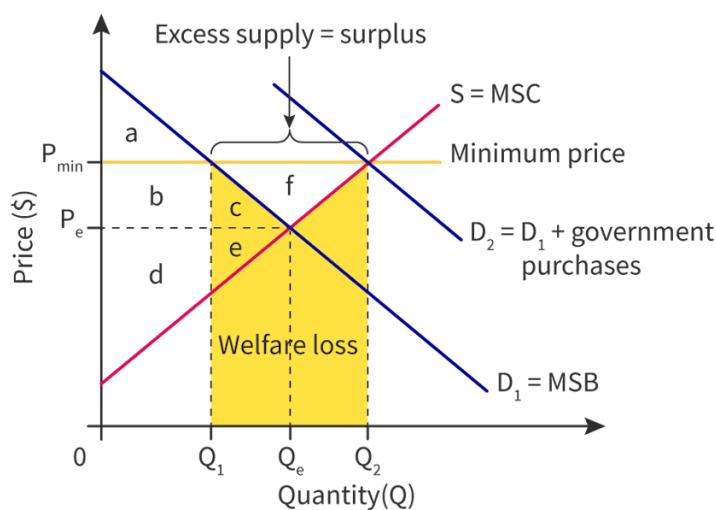
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⚠ Be aware

The word 'surplus' is used often here, with two different meanings. When discussing consumer, producer or community surplus, we are referring to the differences between the selling price and how much consumers/producers would be willing / able to buy / sell at. Minimum prices cause surpluses in terms of the volume of goods produced, or excess supply. If this confuses you, stick to referring to excess supply when discussing volume of goods, and keep the word surplus solely for community surplus discussions.

If the government buys the excess supply, producer surplus is now B + C + D + E + F (all of the area above the supply curve and below the price received by producers, P_{min}, for the units sold).

This means that the consumer plus producer surplus increases after the price control and government purchase of the excess supply, because producers gain the area B + C lost by consumers, in addition to F.

The government has a cost of $P_{min} \times (Q_2 - Q_1)$, which is a loss of social welfare. Because part of this loss is compensated by the gain in producer surplus represented by F, the net deadweight loss **for society** is the yellow shaded area shown in **Figure 4**.

Figure 4. The impact of a price floor on community surplus with government purchases.

👁 More information for figure 4

The graph illustrates the impact of a price floor on community surplus with government purchases. It is a supply and demand graph with price (P) on the Y-axis and quantity (Q) on the X-axis.

- The supply curve is labeled 'S = MSC' and the demand curves are labeled 'D1 = MSB' and 'D2 = D1 + government purchases'.
- The price floor is set at Pmin, above the equilibrium price Pe, and results in quantities Q1, Qe, and Q2.
- Arrows indicate excess supply being labeled as surplus between Q1 and Q2.
- Multiple areas are shaded and labeled: 'a,' 'b,' 'c,' 'd,' 'e,' and 'f'.
- The area marked as 'welfare loss' is highlighted in yellow between Q1 and Q2.
- The graph shows the deadweight loss due to the price floor, highlighting the reduction in community surplus through the displacement of the supply and demand curves.

[Generated by AI]

Consequences for market stakeholders

Let us analyse the consequences of imposing a price floor for consumers, producers, workers and government.

Consumers. Consumers of the good are worse off as they will now consume a smaller amount of the good at a higher price.

Producers. If the government purchases the surplus, producers will sell a greater amount of the good than before ($Q_2 > Q_e$) and receive a higher price for it. Their total revenue increases after the price floor is imposed, therefore they are better off. If the government does not purchase the surplus then producers sell a lower volume of the good at a higher price. It depends on the price elasticity of demand whether their revenue increases or falls.

Workers. As the size of the market increases, it is likely that more workers will be hired in this market and consequently employment will rise; therefore workers will be better off.

Government. If the government buys the surplus it will incur a cost and have less funds to spend on other public goods and services, which is an opportunity cost. Additionally, if it has to store the product the cost will be even higher.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Calculating price controls (HL)

| Section | Student... (0/0) | 📢 Feedback | 🖨 Print | (/study/app/pp/sid-186-cid-754025/book/calculating-price-controls-hl-id-31090/print/) | Assign |

At this point, you are ready to calculate the effects of price controls, using everything you have learned so far in this subtopic.
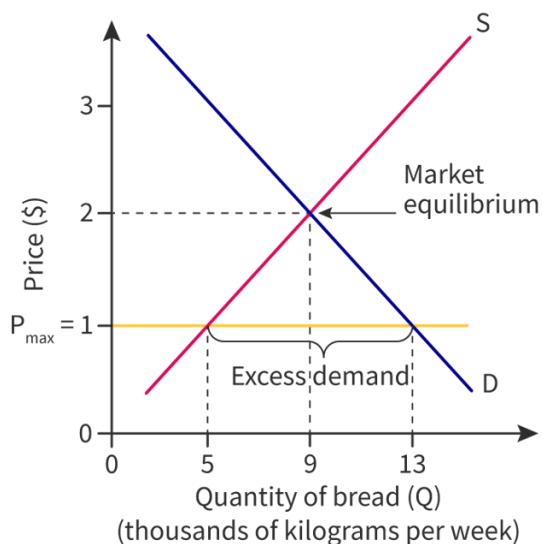
Price ceilings

Calculations related to the price ceiling issue are a repetition of what you have learned to do in previous sections, but applied to this specific case. You should be able to calculate possible effects from the price ceiling diagram, including the resulting shortage and the change in consumer expenditure (which is equal to the change in firm revenue).

Figure 1 shows the market for bread where the government has set a maximum price control of $1 per kilogram of bread to make it more affordable to low-income consumers and consequently increasing consumption of it.

Use this diagram to answer the questions below.

Figure 1. Maximum price imposed on the market for bread.

More information for figure 1

This is a supply and demand diagram illustrating the market for bread. The X-axis represents the quantity of bread in thousands of kilograms per week, while the Y-axis represents the price in dollars. D (Demand) and S (Supply) are represented by intersecting lines, forming the market equilibrium point where the price is 2 dollars and the quantity is 9 thousand kilograms. A horizontal line at 1 dollar, labeled as Pmax, shows the maximum imposed price, creating a price ceiling. This leads to excess demand, indicated by a bracket beneath the equilibrium point. At this lower price, the quantity demanded exceeds the quantity supplied, illustrating a surplus.

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Worked example 1

Based on **Figure 1,** answer the following questions.

1) Calculate the change in producers'/suppliers' revenue after the maximum price is set.

2) Calculate the shortage generated by the price ceiling.

Question 1

The change in the firm's total revenue (TR) is:

$$\Delta TR = TR_2 - TR_1$$

where TR_2 is the firm's revenue after the maximum price and TR_1 is the revenue before.

$$TR_1 = \$2 \times 9000 = \$18\,000$$

$$TR_2 = \$1 \times 5000 = \$5000$$

$$\Delta TR = \$5000 - \$18\,000 = -\$13\,000$$

<u>Result:</u> The firm's total revenue has fallen by \$13 000 after the maximum price was set.

Question 2

At the price ceiling $P_{max} = \$1$, the quantity demanded is 13 000 and the quantity supplied is 5000.

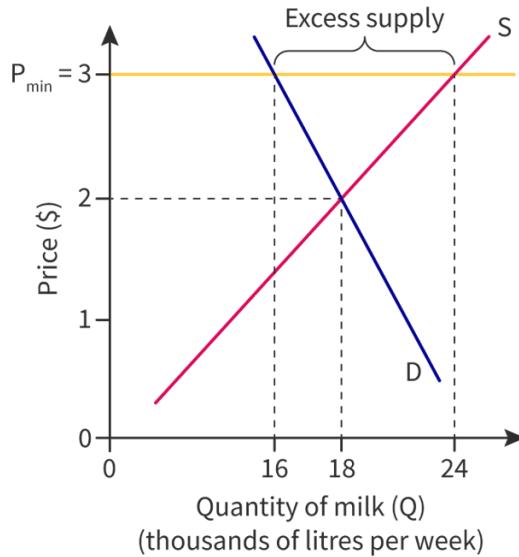Therefore, the excess demand, or shortage, of bread is 13 000 − 5000 = 8000 kilograms.

<u>Result:</u> There is a shortage of 8 000 kilograms of bread per week.

Price floors

With respect to price floors, you should be able to calculate the possible effects from the price floor diagram, including the resulting surplus, the change in consumer expenditure, the change in producer revenue and the government expenditure to purchase the surplus.

Figure 2 shows the market for milk where the government has set a minimum price control of $3 per litre of milk to ensure revenue for milk producers. The government considers milk to be a fundamental component of the population's diet, and it wants to secure the jobs of thousands of workers who are employed in the dairy industry.

Use this diagram to answer the questions below.

Figure 2. Minimum price set on the milk market.

👁̸ More information for figure 2

The graph illustrates the supply and demand scenario in the milk market, with a set minimum price (P_min) of $3. The X-axis represents the quantity of milk in thousands of liters per week, ranging from 0 to 24. The Y-axis shows the price in dollars, ranging from 0 to 3. Two intersecting lines represent the supply (S) and demand (D) curves. The supply curve is upward sloping, while the demand curve is downward sloping. At a price of $3, which is above the equilibrium, there is an 'Excess supply' area marked on the graph. This indicates a situation where the supply quantity exceeds the demand quantity due to the minimum price set above equilibrium.

[Generated by AI]

Worked example 2

Based on **Figure 2**, answer the following questions.

1) Calculate the change in firms' revenue after the minimum price is set, assuming that they sell all of their supply at that price.

2) Calculate the change in consumers' expenditure after the minimum price is imposed.

3) Calculate the surplus (excess supply) generated by the price floor.

4) Calculate the government's expenditure to purchase the surplus (excess supply).

1) The change in firms' revenue is:

$\Delta TR = TR_2 - TR_1$

where TR_2 is the firms' revenue after the minimum price and TR_1 is the revenue before.

$TR_1 = \$2 \times 18\,000 = \$36\,000$

$TR_2 = \$3 \times 24\,000 = \$72\,000$

$\Delta TR = \$72\,000 - \$36\,000 = \$36\,000$

Result: Firms' total revenue has increased by $36 000 after the minimum price was set.

2) The change in consumer expenditure (CE) is:

$\Delta CE = CE_2 - CE_1$

where CE_2 is the consumers' expenditure after the minimum price and CE_1 is the expenditure before.

$CE_1 = \$2 \times 18\,000 = \$36\,000$

$CE_2 = \$3 \times 16\,000 = \$48\,000$

$\Delta CE = \$48\,000 - \$36\,000 = \$12\,000$

Result: Consumers' expenditure has increased by $12 000 after the minimum price was set.

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3) At the price floor P_{min} = \$3, the quantity demanded of milk is 16 000 litres, while the quantity supplied is 24 000 litres.

Therefore, the excess supply of milk, or surplus, is 24 − 16 = 8.

Result: The surplus is 8000 litres of milk.

4) The government will have to pay producers P_{min} times the amount of surplus in the market, calculated in question 3.

\$3 × 8000 = \$24 000

Result: The government expenditure for buying the surplus of milk would be \$24 000.

⚠ **Be aware**

Notice that in this last example, although the quantity demanded of milk has fallen because of the increase in price, consumers' total expenditure has increased because the demand for milk is inelastic. Therefore, an increase in price will produce a smaller than proportional fall in the quantity demanded.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Indirect taxes

Section   Student... (0/0)   📢 Feedback   🖶 Print (/study/app/pp/sid-186-cid-754025/book/indirect-taxes-id-31091/print/)   Assign

⊗ Student view

Indirect taxes refer to taxes on expenditure. They are not charged *directly* on people's incomes or wealth. They are paid *indirectly* by consumers when they purchase a good, as indirect taxes are included in the price of the good.

The aims of this policy for the government are usually to:

- collect government revenue.

- discourage consumption of undesirable and/or dangerous goods.

- redistribute income within the population.

- correct negative externalities and socially inefficient allocation of resources.

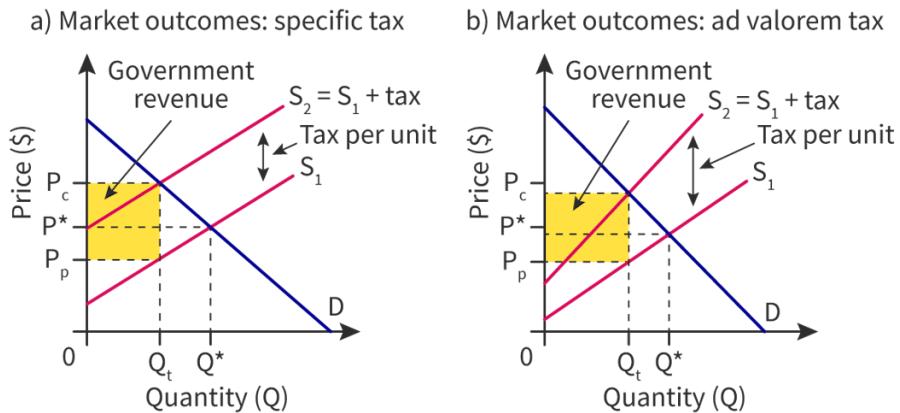**Figure 1.** Petrol is taxed using indirect taxation in many countries.

Credit: Getty Images Gu

✓ **Important**

Notice that taxes are classified into two main groups: indirect taxes and direct taxes. Unlike indirect taxes, direct taxes are charged on people's incomes or wealth and are paid directly to the government by the taxpayers, such as income tax or corporate income taxes.

Indirect taxes are also called excise taxes. There are two types to consider:

- Specific tax. This is a fixed amount of tax imposed on a good or service per unit sold; for example, a tax of EUR 2 per can of beer.

- Percentage tax or ad valorem tax. This is a fixed percentage charged on the selling price of the good; for example, a 20 per cent tax on the price of cigarettes. In this case the amount of the tax increases as the price of the good or service increases.

Figure 2. Differences between specific and ad valorem taxes.

More information for figure 2

The image features two side-by-side graphs illustrating the effects of taxes on market outcomes. Both graphs have the same X-axis labeled 'Quantity (Q)' and the same Y-axis labeled 'Price ($)'. The quantity axis extends from 0 to a quantity marked as Q. *The price axis shows three points: Pp, P*, and Pc.*

In the left graph, titled 'Market outcomes: specific tax', there's a supply curve S1, and a second supply curve S2 which is shifted upward due to a tax. The shaded region above P* represents government revenue. This graph shows the supply curve shifting uniformly with a tax per unit applied.

The right graph, titled 'Market outcomes: ad valorem tax', also shows supply curves S1 and S2 with a similar shift pattern. The shaded area again represents government revenue. However, the nature of the tax leads to a differing degree of curve shift as it is proportional to the price, creating varying gaps between S1 and S2 along the price axis.

Both diagrams include downward-sloping demand curves (D) with interactions demonstrating tax impacts, as well as annotations marking 'Tax per unit', 'Government revenue', and equations S2 = S1 + tax.

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When a tax is imposed on a good or service, it is paid by the firm to the government. This means that for every level of output, the firm will try to pass the tax on to consumers, shifting the supply curve upwards by the amount of the tax.

The firm will be willing and able to supply to the market each level of output at the original price plus the amount of the tax. Or, put differently, for each original pre-tax price, the firm will be willing to supply less output (seen as a shift inwards/to the left of the supply curve).

Figure 2a shows the effect of imposing a specific tax on the supply curve of a good. S_1 is the original supply curve and S_2 is the curve after the tax (S_1 + tax). As the amount of the tax is the same regardless of the price of the good, the new supply curve shifts upwards parallel to the original one, by the amount of the tax per unit.

In **Figure 2b** the tax is a percentage of the price, so the amount of tax increases as the price of the good increases. The supply curve shifts upwards by the amount of the tax per unit, but the gap between S_1 and S_2 will be bigger as the price is higher. So a 20 per cent tax on a price of EUR 5 is EUR 1, while a 20 per cent tax on a price of EUR 10 is EUR 2.

⚠ **Be aware**

On a graph, the difference between a specific and an ad valorem tax is that a specific tax shifts the supply curve upwards parallel to the original supply curve, while for a percentage tax, the gap between the two supply curves increases as the price rises.

Before the tax, the market was in equilibrium where D crosses S_1, at an initial equilibrium price P_E and equilibrium quantity Q_E.

Once the tax is set, the supply curve shifts upwards from S_1 to S_2 by the amount of the tax. At the previous equilibrium price P_E, producers will now be willing and able to supply a smaller amount of the good to the market, as they have to pay the tax to the government per unit of output. Alternatively, producers can try to pass the tax on to consumers in order to sell the same amount Q_E.

At higher prices, because of the law of demand, consumers will demand less of the good, and therefore the new equilibrium price and quantity will be established at P_C and Q_T.

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ⓘ **Exam tip**

Questions like 'Evaluate the consequences of imposing an indirect tax on alcoholic beverages. Include the effects on consumers, producers and government' are very likely to appear in Paper 1, part (b) essay questions.

Be aware that colours cannot be used and that a great part of your answer will be based on the clarity of your diagrams and explanations. Every relevant point of the diagram should be marked with a letter that will then allow you to describe and explain the effects on each stakeholder properly.

The effect on the different stakeholders

To understand the changes produced by an indirect tax on market outcomes, and how the different stakeholders are affected in each case, we should try to answer the following questions.

- What will happen to the price paid by consumers before and after tax?
- What will happen to the revenue received by producers?
- What is the situation of the government before and after tax?
- What will happen to the size of the market and what will be the subsequent effect on the workers in that market?
- Is there an effect on society as a whole?

The market outcomes due to the tax, reflected in **Figure 2a**, are as follows: the equilibrium quantity produced and consumed decreases from $Q^{\star}$ to Q_t, which means a reduction in the size of the market. The equilibrium price increases from $P^{\star}$ to P_c, which is the price paid by consumers. Producers receive P_c from consumers, but have to pay the amount of the tax to the government for every unit sold, so their final revenue is P_p per unit.

In **Table 1** we can see the specific effect of the tax on each of the market's stakeholders, based on **Figure 2a**.

Table 1. Effects of an indirect tax on the different stakeholders.

Stakeholder	Effect (as seen on Figure 2)
Consumers	Consumer expenditure on the good changes from $P^{\star} \times Q^{\star}$ to $P_c \times Q_t$. Consumers are **worse off** after the tax, because they end up paying a higher price ($P_c > P^{\star}$) and consuming a smaller amount of the good ($Q_t < Q^{\star}$).

Stakeholder	Effect (as seen on Figure 2)
Producers	Producer revenue falls from P* × Q* to P_p × Q_t, where P_p = P_c — tax per unit. Producers are **worse off** as they end up selling a smaller amount of the good (Q_t < Q*) and receiving a lower final price (P_p < P_c) after paying the tax to the government.
Government	The government is now **better off** because it collects revenue from the tax, which can be used to spend on the provision of public goods and services or any other government expenditure. Government revenue is equal to (P_c — P_p) × Q_t, which is the difference between the two supply curves at the new equilibrium level of output in the market. While it looks like the government may be the only stakeholder who benefits from the tax, taxes are usually levied on goods that are deemed harmful for society, so others do gain from the reduction in the sale of those types of goods.
Employment	The market has become smaller, as fewer units of output are consumed and produced after the tax (Q_t < Q*). If a lower amount of goods are sold then fewer workers are needed to produce them. Some workers might be fired and therefore the tax may lead to unemployment. Workers are **worse off** if they become unemployed.

⚠ **Be aware**

Except for the different way in which the supply curve shifts in each case, the effects on market outcomes of an indirect tax are qualitatively the same no matter if it is a specific tax or an ad valorem tax. The only thing that changes is the gap between the two supply curves.
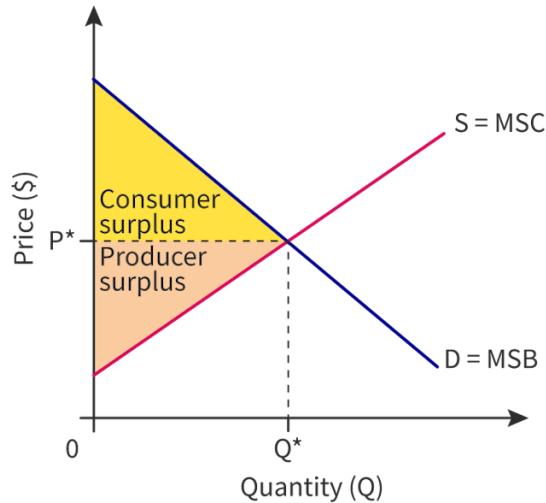
The effects of indirect tax on consumer and producer surplus

In subtopic 2.3 (/study/app/pp/sid-186-cid-754025/book/the-big-picture-id-29864/), we learned that in a competitive free market, at the market equilibrium point (and with no government intervention), community surplus is maximised and society is producing the socially optimal amount of a good, thereby achieving allocative efficiency. This is shown in **Figure 3a** at the point (Q*, P*), where the marginal social cost is equal to the marginal social benefit (MSC = MSB).

What happens to consumer surplus, producer surplus and the total social welfare after imposing an indirect tax on a good?

a) Consumer and producer
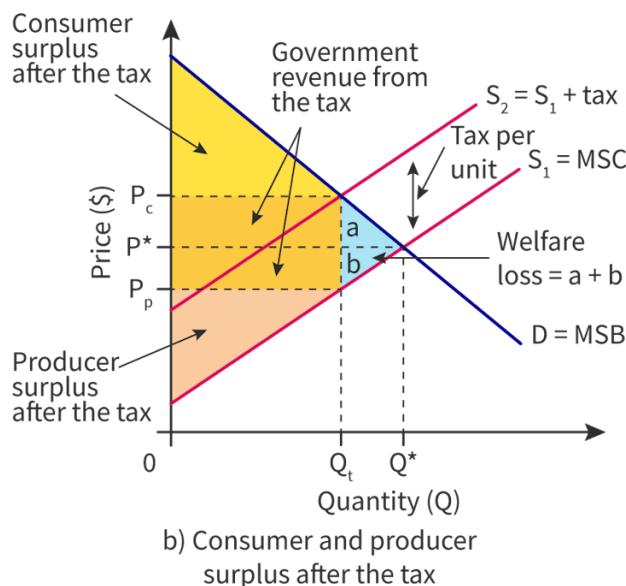surplus before the tax

👁 More information

The image is a graph depicting consumer and producer surplus before a tax is imposed. The graph has a price (P) axis, labeled with dollars ($), which ranges vertically, and a quantity (Q) axis running horizontally. There are two intersecting lines: one labeled 'S = MSC' (presumably the supply/marginal social cost curve), sloping upwards, and the other labeled 'D = MSB' (the demand/marginal social benefit curve), sloping downwards. The intersection of these two lines is marked as equilibrium, with coordinates (P, Q). Above this equilibrium point, a yellow triangular area represents consumer surplus, while a pink triangular area below shows producer surplus.

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b) Consumer and producer
surplus after the tax

Figure 3. Effects of an indirect tax on social welfare.

👁 More information for figure 3

The graph shows the effects of an indirect tax on the supply and demand curves, highlighting changes in consumer and producer surpluses. The X-axis represents Quantity (Q) with points marked at 0, Qt, and Q, *while the Y-axis represents Price ($) with points marked at P*, Pc, and Pp.

In the graph, there are two supply curves: S1 (initial supply) and S2 (new supply after tax), with S2 being parallel and above S1, indicating a shift due to the tax. The demand curve, labeled D = MSB, intersects with both supply curves. The intersection of S1 and D is at equilibrium point (Q, *P*), while the intersection of S2 and D is at point (Qt, Pc) showing the new equilibrium after tax.

Different areas between these curves are shaded to represent economic impacts: - The triangle above line Pc and limited by the Y-axis up to Qt represents the Consumer Surplus after the tax. - Below the Pc line and down to S2 illustrates Producer Surplus after the tax. - A small triangle above P* between the S2 curve and the line at welfare loss (= a + b) represents government revenue from the tax.

The graph also includes annotations marking shifts and highlighting important parameters: 'Tax per unit' between S1 and S2, along with 'Welfare loss = a + b' beside the intersection of these curves, underscoring the deadweight loss due to the tax.

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As we can see in **Figure 3b**, after the tax, the supply curve shifts from S_1 to S_2 and the equilibrium point moves from $(Q^\star, P^\star)$ to (Q_t, P_c).

Consumer surplus is reduced from the yellow shaded triangle between P* and the demand curve up to quantity Q* (**Figure 3a**, before the tax) to the yellow triangle between P_c and the demand curve up to Q_t (**Figure 3b**, after the tax).

Producer surplus is reduced from the peach shaded triangle between P* and the supply curve up to quantity Q* (before the tax) to the peach shaded triangle between P_p and the supply curve up to Q_t (after the tax).

The rectangle $(P_c - P_p) \times Q_t$ in **Figure 3b** is now the government tax revenue, which comes back to society in the form of government spending. However, there are two parts of the original consumer and producer surplus that are lost: triangles A and B in **Figure 3b**. The area A + B represents the social welfare that is completely lost because of the tax and is called welfare loss or deadweight loss.

The welfare loss appears because the tax distorts the market outcome, reducing the quantity produced so that it is lower than the socially optimal amount ($Q_t < Q^*$), assuming there are no externalities present. Therefore, there is an under-production of the good and an under-allocation of resources from the society's point of view, resulting in allocative inefficiency.

⚠ **Be aware**

At the new equilibrium quantity Q_t, the MSB > MSC, meaning that the benefit society receives for consuming the last unit is greater than the cost of producing this last unit. Society would be better off if more of this good were produced and consumed. This will not be the case for markets with negative externalities, however.

Effect on society as a whole

This policy should be evaluated within the context of the objective or reason for setting this tax. For example, the reasons are often to achieve other social objectives or to solve **market externalities**.

However, assuming that free market equilibrium, with no government intervention, is the socially optimal amount of the good, in the absence of externalities, then society as a whole is worse off. This is because the imposition of the tax distorts the market, producing an under-allocation of resources to the production of this good.

Summary of effects of an indirect tax

Assuming normal demand and supply curves, **Table 2** presents a summary of the effects we have discussed in this section.

Table 2. Summary of effects of an indirect tax.

What is the effect on... ?	Effect
The price for consumers	Increases
The equilibrium quantity	Decreases
The net price for producers	Decreases
The total revenue of producers	Decreases
The total expenditure of consumers	Depends on PED
Government revenue	Increases
Community surplus	Decreases

6 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Calculating indirect taxes (HL)

Section   Student... (0/0)   📢 Feedback   🖨 Print (/study/app/pp/sid-186-cid-754025/book/calculating-indirect-taxes-hl-id-31092/print/)   Assign

In this section, we are going to look at calculating indirect taxes on a market for sugar-sweetened beverages.

Figure 1. Sugar sweetened beverages are starting to be taxed by many governments.
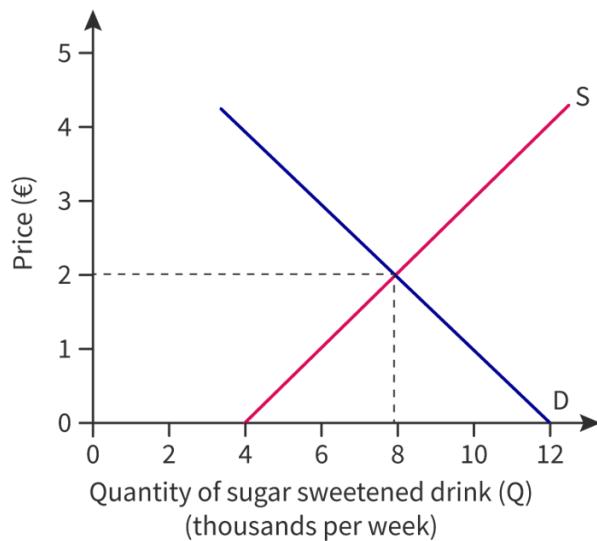
Getty Images celsopupo

First, plot both original demand and supply functions on a graph, as shown in **Figure 2**.

The price is in euros and the quantity is in thousands of cans per week.

The market equilibrium can be found where S = D, at P = EUR 2.00 and Q = 8.

Now assume that a tax of EUR 1.50 per unit is imposed on cans of sugary drinks, as shown in **Figure 3**.

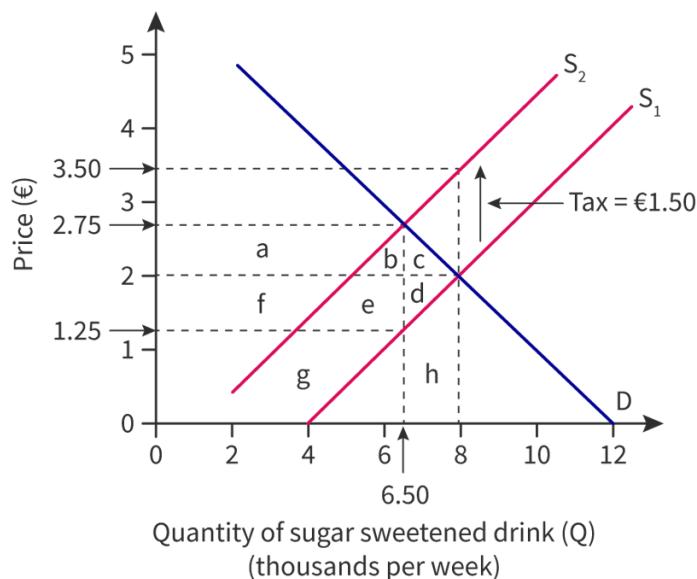**Figure 2.** Market equilibrium for sugar-sweetened drinks before the tax.

Overview
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754025/c

This graph illustrates the market equilibrium for sugar-sweetened drinks before a tax is imposed. The X-axis represents the quantity of sugar-sweetened drinks (in thousands per week), ranging from 0 to 12. The Y-axis displays the price in euros, ranging from 0 to 5. The graph features two lines intersecting to show the equilibrium point. The demand curve (D) is downward-sloping, beginning at around 12 on the X-axis and crossing the Y-axis below 2 euros. The supply curve (S) is upward-sloping, starting at the origin and extending towards higher prices as the quantity increases. The intersection of D and S denotes the market equilibrium, where the price is approximately 2 euros, and the quantity is around 6 thousand units per week. This visual presentation provides an understanding of pricing and quantity in the sugar-sweetened drink market before any tax interventions.

[Generated by AI]

Figure 3. Indirect tax on sugar-sweetened drinks.

❌

Student
view

The image is a graph illustrating the impact of an indirect tax on sugar-sweetened drinks. The X-axis represents the quantity of sugar-sweetened drinks in thousands per week, ranging from 0 to 12. The Y-axis represents the price in euros, ranging from €0 to €5.

Two supply curves, S1 and S2, are shown. S1 is the original supply curve, and S2 is the new supply curve shifted upward by the tax amount (€1.50). The demand curve, labeled D, intersects both supply curves.

The intersection of S1 and D at equilibrium price is at P=€2 and quantity Q=8. The new equilibrium with tax is at P=€3.50 and a lower quantity. The difference between the two prices represents the tax amount.

Grid lines and labels (a, b, c, d, e, f, g, h) show price and quantity levels, further detailing how the tax shifts the supply curve and changes equilibrium.

[Generated by AI]

We know that the supply curve shifts upwards by the amount of the tax. At the previous equilibrium quantity, Q = 8, the new supply curve will pass through a price EUR 1.50 above the previous equilibrium point of EUR 2.00, at P = EUR 3.50. Because the tax is a specific tax with a flat value of EUR 1.50, this is enough information to draw the new supply curve, because it is parallel to the old one.

We now have the new supply curve S_2 as shown in **Figure 3**, which we can use to calculate all of the other effects of the tax.

Worked example 1

Using **Figure 3**, calculate the following for the market for sugary drinks following the implementation of the indirect tax.

1. The total revenue collected by the government from the tax
2. The change in consumer expenditure
3. The change in producer revenue
4. The change in consumer surplus
5. The change in producer surplus
6. The welfare loss

Question 1

Student
view

The total revenue collected by the government from the tax is shown by the area A + B + E + F in **Figure 3**.

Total revenue collected

= per unit tax × new quantity consumed after the tax

= EUR 1.50 × 6500

= EUR 9750

Question 2

The consumer expenditure prior to the implementation of the tax is shown by the area D + E + F + G + H in **Figure 3.**

Consumer expenditure before the tax

= previous equilibrium price × the equilibrium quantity before the tax

= EUR 2.00 × 8000

= EUR 16 000

The consumer expenditure after the implementation of the tax is shown by the area A + B + F + E + G in **Figure 3.**

Consumer expenditure after the tax

= new price paid by consumers times new quantity consumed after the tax

= EUR 2.75 × 6500

= EUR 17 875

The change in consumer expenditure

= EUR 17 875 − EUR 16 000

= EUR 1875

Question 3

The producer revenue before the tax is shown by the area D + E + F + G + H in **Figure 3.**

Producer revenue before the tax

= previous equilibrium price × the equilibrium quantity before the tax

= EUR 2.00 × 8000

= EUR 16000

The producer revenue after the tax is shown by the area G in **Figure 3**.

Producer revenue after the tax

= new price received by producers × new quantity sold after the tax

= EUR 1.25 × 6500

= EUR 8125

So, the change in the producer revenue is the original revenue before the tax minus the new revenue after the tax

= 16000 - 8125 = EUR 7875

Question 4

The loss of consumer surplus is the area A + B + C in **Figure 3**.

In monetary terms this would be EUR 5437.50 = EUR 4875 (area A + B) + EUR 562.50 (area C).

Area C, which is a right-angled triangle, is calculated as half of the area of a square at that point:

$(2.75 - 2) \times (8000 - 6500) \times 0.5$

Question 5

The loss of producer surplus is the area D + E + F in **Figure 3**.

In monetary terms this would be EUR 5437.50 = EUR 4875 (area E + F) + EUR 562.50 (area D).

Area D, which is a right-angled triangle, is calculated as half of the area of a square at that point:

$(2 - 21.25) \times (8000 - 6500) \times 0.5$

Question 6

The welfare loss is shown by the area C + D in **Figure 3**.

EUR 1125 = EUR 10 875 − EUR 9750 (total consumer and producer welfare loss minus government's tax revenue)

Notice that in this specific example, the burden of the tax is divided equally between consumers and producers (EUR 4875 each). This is because price elasticity of demand (PED) = price elasticity of supply (PES).

$$\text{PED} = \frac{\%\Delta\text{Qd}}{\%\Delta\text{P}} = \frac{18.75\%}{37.5\%} = 0.5$$

$$\text{PES} = \frac{\%\Delta\text{Qs}}{\%\Delta\text{P}} = \frac{18.75\%}{37.5\%} = 0.5$$

⚠ **Be aware**

Although the tax generates a great loss to consumers and producers, not all of this loss of welfare is lost to society since the tax revenue returns to society in the form of government expenditure.

✓ **Important**

An indirect tax produces a net loss to society because the consumers and

producers of the taxed good lose more welfare than society gains in tax revenue.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Subsidies

Section   Student… (0/0)   📢 Feedback   🖨 Print   (/study/app/pp/sid-186-cid-
                                                          754025/book/subsidies-id-31093/print/)   [Assign]

Subsidies are per-unit payments that are used to lower production costs and increase the output of the market. We discussed these briefly earlier in this subtopic when we looked at the Indonesian government subsidising fuel to make it more affordable for people, and the Common Agricultural Policy of the European Union. Broadly, the aims of subsidies for the government are usually:

- to increase revenues of producers.
- to make basic necessities and merit goods more affordable to low-income consumers.
- to encourage the consumption of a good or service that is considered beneficial to consumers.
- to support growth of a particular industry.
- to encourage exports and protect national industry from foreign competition.
- to correct positive externalities, improving the allocation of resources.
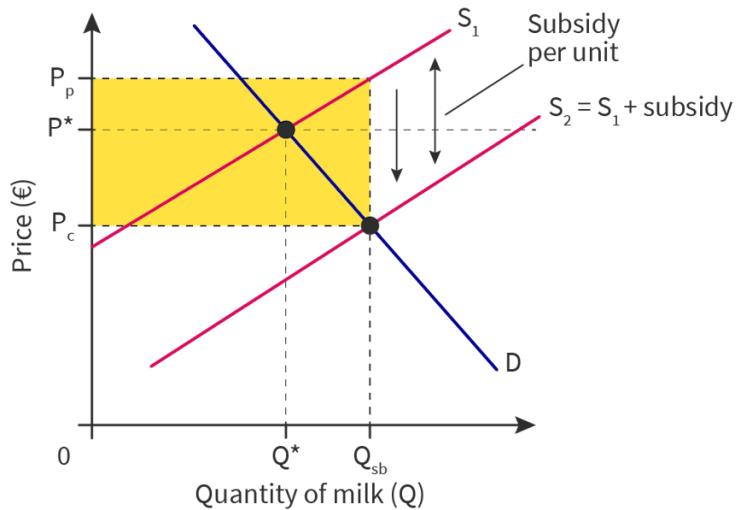
The effect of subsidies on the market

Figure 1 shows the case of granting a subsidy to the dairy industry, per unit of output of milk. Dairy farming is subsidised by the European Union.

Before the subsidy, the market was in equilibrium where D crosses S_1, at an initial equilibrium price P★ and equilibrium quantity Q★.

Once the subsidy is granted, the supply curve shifts downwards from S_1 to S_2 by the amount of the subsidy. Producers are willing and able to supply a greater amount of milk to the market at the previous equilibrium price, P★, because their cost of production has fallen due to the subsidy they have received from the EU per unit of output sold.

As the supply increases, the equilibrium price in the market falls from P★ to P_c. At lower prices, because of the law of demand, consumers will demand more milk and therefore the new equilibrium price and quantity will be established at P_c and Q_{sb}.

Figure 1. Effects of a subsidy on market outcomes.

👁 More information for figure 1

This graph illustrates the impact of a subsidy on the milk market, represented by supply and demand curves. The X-axis indicates the quantity of milk (Q) with values increasing from left to right, and the Y-axis represents the price in euros (€), increasing vertically.

Initially, the market equilibrium is at price P *and quantity Q*, with supply curve S1 intersecting demand curve D. Following the application of a subsidy, the supply curve shifts to S2, indicating an increase in supply due to the subsidy per unit. This shift results in a new equilibrium at price Pc and quantity Qsb.

The area between P *and Pc is highlighted to represent the subsidy impact, denoted by arrows indicating the shift in supply. Key labeled points are Pp, P*, Pc for prices, and Q*, Qsb for quantities. The graph reflects the relationship between changes in supply and resulting shifts in market equilibrium.

[Generated by AI]

⊙ **Exam tip**

A very common mistake in examination questions on subsidies is to shift the demand curve instead of the supply curve.

The confusion arises because of cases like family allowances or unemployment benefits , which are commonly considered a type of subsidy. However, these are not directly related to the amount consumed of a specific good. In these cases, they would shift the demand curve because they imply an increase in people's income. Similarly, electric car purchases in some countries have been boosted by subsidies from governments where the aim of the payment is to increase demand from consumers.

If the aim of the subsidy is to lower costs of production and the payment is going to firms, then it will shift the supply curve. In the exams, this is the type of subsidy that you will be asked about.

The effect on different stakeholders

To understand the changes produced by a subsidy on market outcomes, we need to repeat the same methodology we used for indirect taxes and analyse how the different stakeholders are affected, answering the following questions.

- What will happen to the price paid by consumers before and after the subsidy?
- What will happen to the revenue received by producers?
- What is the situation of the government before and after the subsidy?
- What will happen to the size of the market and, therefore, what will the effect be on workers in that market?
- Is there an effect on society as a whole?

The **market outcomes** due to the subsidy, reflected in **Figure 1**, are as follows: the equilibrium quantity of milk produced and consumed increases from Q^* to Q_{sb}, which means **an increase in the size of the market**. The equilibrium price decreases from P^* to P_c, which is the price paid by consumers. Producers receive P_c from consumers, plus the amount of the subsidy per unit of output, so their final revenue is P_p per unit.

In **Table 1** we can see the specific effect of the tax on each of the **market's stakeholders**, based on **Figure 1**.

Table 1. Effects of subsidies on different stakeholders.

Stakeholder	Effect (seen in Figure 1)
Consumers	Consumers' expenditure on the good changes from P* × Q* to P_c × Q_{sb}. Consumers are **better off** after the subsidy because they pay a lower price (P_c < P*) and consume a greater amount of the good (Q_{sb} > Q*).
Producers	Producers' revenue rises from P* × Q* to P_p × Q_{sb}, where P_p = P_c + subsidy per unit. Producers are **better off** as they sell a greater amount of the good (Q_{sb} > Q*) and receive a higher final price (P_p > P_c) after receiving the subsidy from the government.
Government	The government is now **worse off**, as it has a cost because of the subsidy. The cost of the subsidy is equal to (P_p — P_c) × Q_{sb}, which is the difference between the two supply curves at the new equilibrium level of output in the market. The government has an **opportunity cost** as the funds granted in subsidies cannot be used to provide public goods and services or for any other government expenditure.
Employment	The market has become bigger because more units of output are consumed and produced after the subsidy (Q_{sb} > Q*). If a greater amount of goods are sold, then more workers are needed to produce them. Therefore, the subsidy may lead to higher employment in this market. Workers are **better off** if more people are employed.

Effect on society as a whole

Again, as in the case of taxes, the final effect on society should be evaluated within the context of the objective of granting the subsidy.

However, assuming that the free market equilibrium, with no government intervention, is the socially optimal amount of the good, in the absence of externalities, then society as a whole is **worse off** with the subsidy because there is an over-allocation of resources to the production of the subsidised good. Additionally, the higher price received by producers allows relatively inefficient producers to keep producing as they are protected by the subsidy. In this sense the society is worse off too.

Summary of the effects of a subsidy

Assuming normal demand and supply curves, **Table 2** presents a summary of what has been explained above.

Table 2. Summary of effects of a subsidy.

What is the effect on... ?	Effect
The price for consumers	Decreases
The equilibrium quantity	Increases
The final price for producers	Increases
The total revenue of producers	Increases
The total expenditure of consumers	Depends on price elasticity of demand (PED)
Government revenue	Decreases
Social welfare	Decreases

⚠ **Be aware**

A subsidy in itself is negative for society, because it distorts market equilibrium. However, the final effect of a subsidy on society's welfare will depend on the reason for granting the subsidy and its effectiveness in achieving this aim.
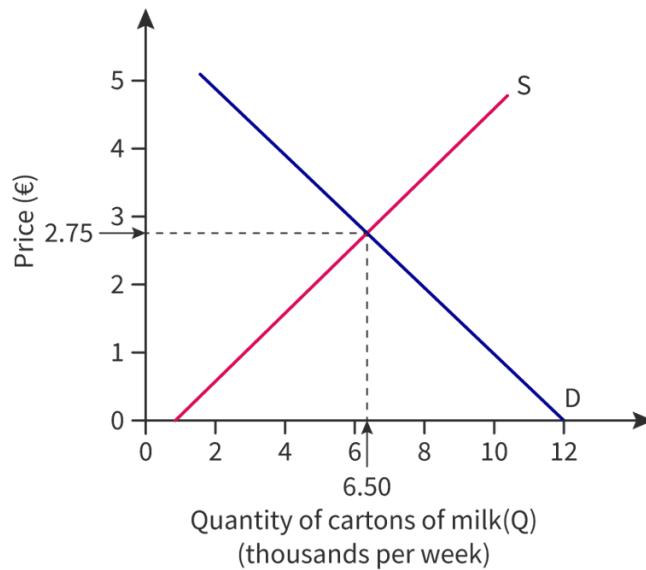
3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Calculating subsidies (HL)

Overview
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Assign

As with indirect taxes, we need to be able to make calculations from diagrams for Paper 3, the policy response paper. We will start in the same way that we did for indirect taxes.

First, plot the original demand and supply functions for milk on a graph, as shown in **Figure 1**.

The market equilibrium can be found where S = D, at P = EUR 2.75 and Q = 6.5.

Figure 1. Market equilibrium of milk before the subsidy.

👁 More information for figure 1

The image shows a graph representing the market equilibrium of milk. The X-axis represents the quantity of cartons of milk measured in thousands per week, ranging from 0 to 12. The Y-axis depicts the price in euros (€), with values from 0 to 5. Two lines intersect on the graph: the supply curve (S) and the demand curve (D). The supply curve slopes upward, while the demand curve slopes downward. The equilibrium point where the two lines intersect occurs at a price (P) of €2.75 and quantity (Q) of 6.5 thousand cartons per week. This point indicates the balance between supply and demand before any subsidy is applied. The axes are labeled as 'Price (€)' for the Y-axis and 'Quantity of cartons of milk (Q) (thousands per week)' for the X-axis. Dotted lines indicate the equilibrium point values on both axes.
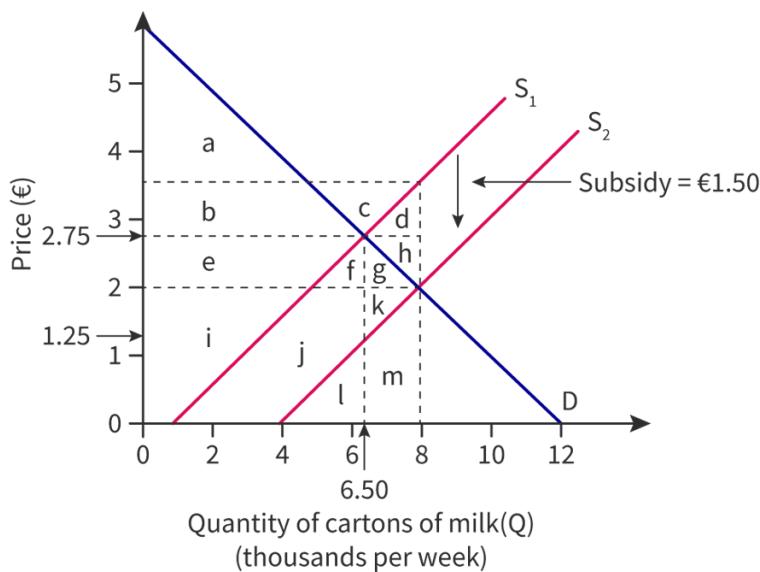
[Generated by AI]

Student
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Now assume that a subsidy of EUR 1.50 per unit is granted to cartons of milk, as shown in **Figure 2** below:

Figure 2. Subsidy granted for milk.

👁 More information for figure 2

> The image is a graph showing the supply and demand for milk cartons, with a focus on the impact of a subsidy. The horizontal axis represents the quantity of cartons of milk in thousands per week, ranging from 0 to 12. The vertical axis represents the price in euros, ranging from 0 to 5.
>
> Two supply curves are present: S1 and S2, where S2 represents the new supply curve after the subsidy has been applied. The subsidy of €1.50 is indicated by an arrow showing the shift from S1 to S2. The demand curve is labeled 'D'.
>
> The intersection points of the demand and supply curves are marked, showing the equilibrium changes due to the subsidy. Before the subsidy, the equilibrium price and quantity are higher compared to after the subsidy. The graph analyzes economic positioning, showing specific areas labeled a, b, c, d, e, f, g, h, i, j, k, l, and m to illustrate how the curves shift and impact quantity and price of milk cartons.
>
> [Generated by AI]

When a subsidy is granted, we know that the supply curve shifts downwards by the amount of the subsidy. Because the gradient stays the same, we only need to calculate one point on the new supply curve to draw it.

An easy point to find is always at the previous equilibrium quantity – in this example, where Q = 6.5. The new supply curve will pass through a price EUR 1.50 below the previous equilibrium point of EUR 2.75, at P = EUR 1.25.

Now we have the new supply curve S_2, as shown in **Figure 2,** which we can use to calculate all the other effects of the subsidy. **Table 1** summarises these effects.

Worked example 1

Using **Figure 2**, calculate the following for the market for milk following the implementation of the subsidy.

1. The total cost of the subsidy to the government
2. The change in consumer expenditure
3. The change in producer revenue
4. The change in producer surplus
5. The change in consumer surplus
6. The welfare loss

Question 1

This is shown by the area B + C + D + E + F + G + H in **Figure 2**.

Total cost of the subsidy to the government

= per unit subsidy × new quantity consumed after the subsidy

= EUR 1.5 × 8000

= EUR 12 000

Question 2

We need to work out the consumer expenditure before and after the subsidy, and then the difference between the two.

The consumer expenditure before the subsidy is shown by the area E + F + I + J + L in **Figure 2**.

Consumer expenditure before the subsidy

= previous equilibrium price × the equilibrium quantity before the subsidy

= EUR 2.75 × 6500

= EUR 17 875

The consumer expenditure after the subsidy is shown by the area I + J + K + L + M in **Figure 2**.

Consumer expenditure after the subsidy

= new price paid by consumers × new quantity consumed after the subsidy

= EUR 2.00 × 8000

= EUR 16 000

Change in consumer expenditure

= EUR 17 875 − EUR 16 000

= EUR 1875

Question 3

We need to work out the producer revenue before and after the subsidy, and then the difference between the two.

The producer revenue before the subsidy is shown by the area E + F + I + J + L in **Figure 2**.

Producer revenue before the subsidy

= previous equilibrium price × the equilibrium quantity before the subsidy

= EUR 2.75 × 6500

= EUR 17 875 (it makes sense that this number is the same as the consumer expenditure before the subsidy in question 2).

The producer revenue after the subsidy is shown by the area B + C+ D + E + F + G + H + I + J + K + L + M in **Figure 2**.

Producer revenue after the subsidy

= new final price received by producers × new quantity sold after the subsidy

= EUR 3.50 × 8000

= EUR 28 000

Question 4

Producer surplus now increases and is represented by the area B + C in **Figure 2** (area below the new producers' price and above the original supply curve).

In monetary terms this would be

= EUR 6000 (area B + C + D) − EUR 562.50 (area D − part of the deadweight loss))

= EUR 5437.50

Area D, which is a right-angled triangle, is calculated as half of the area of a square at that point:

(3.5 − 2.75) × (8000 − 6500) × 0.5

Question 5

Consumer surplus now increases because they pay a lower price and consume a greater amount of the good. This is represented by the area E + F + G in **Figure 2**.

In monetary terms this would be

= EUR 4875 (area E + F) + EUR 562.50 (area G)

= EUR 5437.50

Area G, which is a right-angled triangle, is calculated as half of the area of a square at that point:

$(2.75 - 2) \times (8000 - 6500) \times 0.5$

Question 6

The welfare loss is shown by the area D + H in **Figure 2**, both of which are right-angle triangles, and therefore, can be calculated as half of the area of a square.

Welfare loss

= the cost of the subsidy to the government – the welfare gain for consumers and producers of milk

= EUR 562.50 + EUR 562.50

= EUR 1125

✓ **Important**

A subsidy produces a net welfare loss to society, because the consumers and producers of the subsidised good gain less welfare from it than society loses from the cost of the subsidy.

🧩 **Theory of Knowledge**

Should the government provide services?

This subsection explores provision of health care by the government. It seems that some countries prefer the government to provide health care (for example in the UK, EU, Australia, New Zealand and Canada), whilst other countries prefer the

private market to provide health care (such as the USA).

Which is the best method? Does knowledge sometimes depend upon different perspectives?

Read the article below comparing health care systems ⌁ (https://www.nytimes.com/interactive/2017/09/18/upshot/best-health-care-system-country-bracket.html) around the world, and consider the question below.

Knowledge question: In what ways is knowledge swayed by different perspectives?

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Direct provision of services

| Section | Student... (0/0) | 📢 Feedback | 🖨 Print (/study/app/pp/sid-186-cid-754025/book/direct-provision-of-services-id-31095/print/) | Assign |

Most countries have health services that involve some sort of government intervention. Germany was the first country to introduce a health insurance system for low-wage workers paid for by employers in 1883, and other countries (including the United Kingdom and the Russian empire) soon followed. New Zealand became the first country to launch a national health service between 1939 and 1941. Today, the biggest national health service exists in the United Kingdom, which is known as the National Health Service (NHS). According to (https://www.forbes.com/sites/niallmccarthy/2015/06/23/the-worlds-biggest-employers-infographic/#74a191d3686b)Forbes ⌁ (https://www.forbes.com/sites/niallmccarthy/2015/06/23/the-worlds-biggest-employers-infographic/#74a191d3686b), the NHS is the world's fifth biggest employer.

❌

Student
view

Figure 1. National health services are often, but not always, funded solely through the tax system and provided by the government.
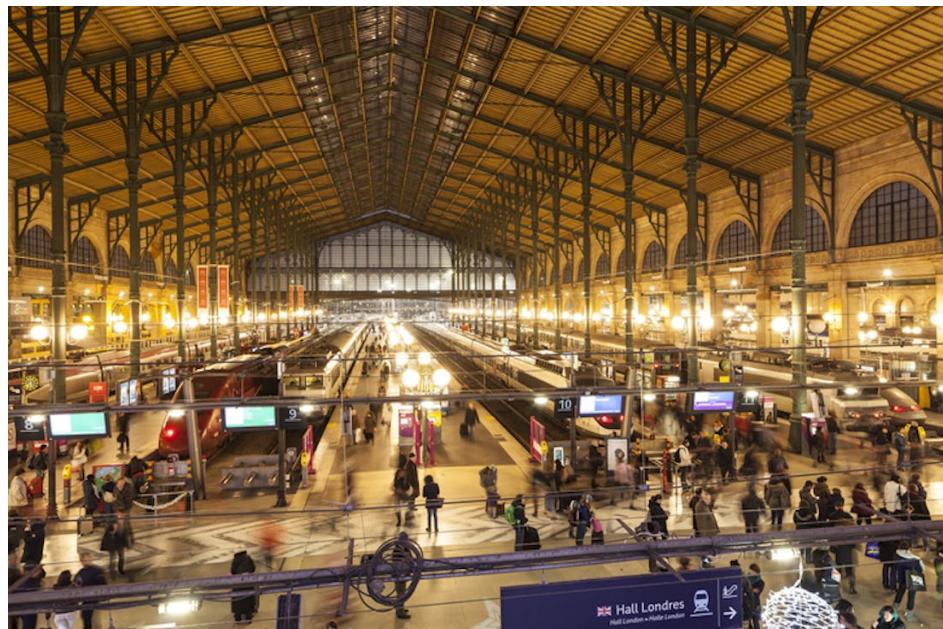
Credit: Getty Images Jose Luis Pelaez Inc

Other services that are often provided directly by the state include:

- Public transport
- Rail networks
- Telecommunications
- Airlines
- Education
- Energy

Direct provision of public services is a hotly debated topic. Some governments or political parties would like to nationalise or renationalise certain services. Some argue that these are essential services for which profit should not be a motive, and that citizens have a right to access these services cheaply. It may also be argued that these industries are inherently uncompetitive, so that having multiple suppliers of these services does not really work. Public services are often examples of natural monopolies. Does it make sense to have multiple train companies operating the same rail line? Or to have multiple companies supplying water to your home?

Figure 2. The rail service in France is nationalised.

Credit: Getty Images Julian Elliott Photography

On the other hand, supporters of privatised essential services argue that the profit motive promotes efficiency. By employing the principles of competition and free markets, a privately funded health care system might allocate resources better and be more cost effective. Privately funded services would be subject to less political debate, and often might be provided sooner because the projects would have fewer political hurdles and less bureaucracy to overcome.

The Netherlands operates a privately funded health insurance system. People pay for their medical insurance instead of funding health care through taxes, and employers must also contribute. The insurance payments are capped and a person cannot be charged differently or be rejected from having insurance based on their health condition or needs. Hospitals and hospital groups are not for profit, compete with each other for patient care and are rated in terms of quality and patient satisfaction.

Student
view

Total healthcare spending as a share of GDP, 2022

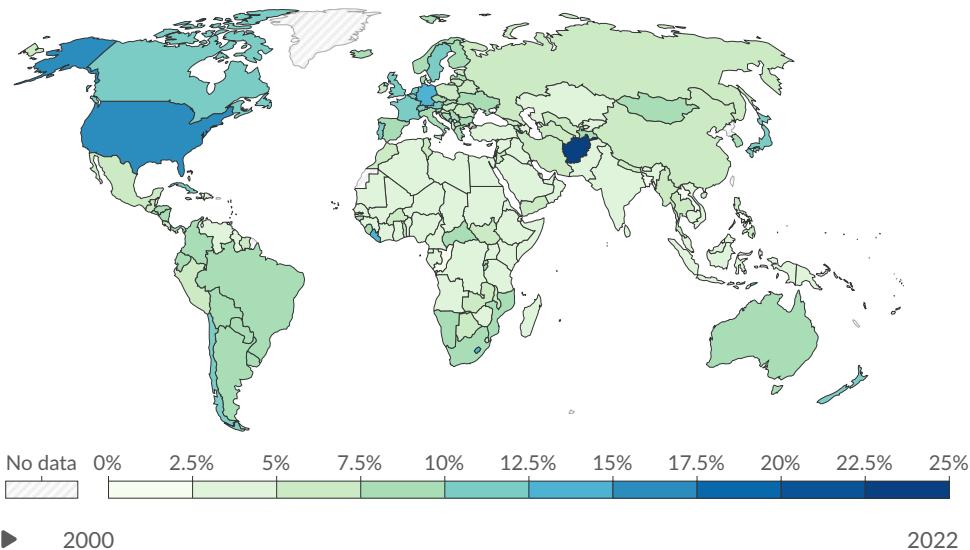Total healthcare expenditure as the share of national gross domestic product (GDP).

Our World in Data

| ⊞ Table | 🌐 Map | ⬚ Line | ⊪ Bar |

✏ Select

No data | 0% | 2.5% | 5% | 7.5% | 10% | 12.5% | 15% | 17.5% | 20% | 22.5% | 25%

▶ 2000   2022

Data source: World Health Organization - Global Health
Observatory (2025) – Learn more about this data
OurWorldinData.org/financing-healthcare | CC BY

⤓ ⤻ ♥ Explore the data →

Interactive 1. Total Healthcare Expenditure as a Share of GDP, 2021.

🚫 More information for interactive 1

An interactive world map represents total healthcare expenditure as a share of GDP in 2021 across different countries. The data is mapped geographically, with each country shaded in varying intensities of blue and green to indicate different levels of healthcare spending relative to GDP. Darker shades signify higher healthcare spending, while lighter shades indicate lower spending. Countries with no available data are shown with a hatched pattern.

The map allows users to explore healthcare expenditure distribution across the world. The United States appears in the darkest shade, suggesting one of the highest proportions of GDP spent on healthcare. Other countries in Europe, Canada, and Australia also have relatively high expenditures, while many nations in Africa and parts of Asia show significantly lower healthcare spending. Afghanistan is another country with relatively high healthcare expenditure as a share of GDP.

The interactive feature includes a time-lapse function, enabling users to view historical trends in healthcare spending by adjusting the slider at the bottom of the map. This allows comparisons over time, which can help in analyzing patterns, economic shifts, or policy changes that have influenced healthcare funding. Users can also switch between a table and chart format, offering different perspectives on the data.

Additional options on the right side allow users to filter by region or country. The data source is the World Health Organization's Global Health Observatory, ensuring reliability. The interactive also features options for downloading and sharing, making it accessible for research or presentation purposes.

⚠ Exam tip

You do not need a diagram to show the direct provision of services by the government, but your essay will benefit from the inclusion of one. Exam questions will very rarely not need a diagram, so make sure you can think of ways to include one.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Command and control regulation and legislation

| Section | Student... (0/0) | 📢 Feedback | 🖨 Print (/study/app/pp/sid-186-cid-754025/book/command-and-control-regulation-and-legislation-id-31096/print/) | Assign |

Regulation and legislation involve the government intervening in markets through the legal system. Legislation refers to laws set out by legislative bodies. For example, in many countries it is the law that all children attend school or participate in education until a certain age. In order for schools to demonstrate that children are participating in education, it is a legal requirement that schools register their students on a daily basis and report frequent absences to the local authority or government. In some countries, parents can even be fined if their children do not attend school regularly.

The term 'regulation' refers to a regulatory body that exists to monitor or regulate an industry. Government departments might be set up to oversee particular sectors such as education, health care or agriculture.

What has been done to reduce smoking?

Since we realised the full consequences for our health of smoking, governments have steadily and increasingly intervened in the tobacco market.

For a while, governments mostly relied on taxes to reduce smoking, and likely took advantage of the revenues that could be earned. While indirect taxation would in theory reduce the quantity demanded of cigarettes by shifting supply inwards and raising prices, the addictive nature of tobacco means that demand for cigarettes is relatively price inelastic. The reduction in quantity demanded is proportionally less than the increase in price, and prices would have to rise drastically for there to be a significant impact on the number of smokers. Governments have now turned to command and control methods to influence smokers.

Age restrictions

Age restrictions are a common form of regulation that has been used for many years to reduce the number of people who are smoking in the population. Most countries prohibit the sale of cigarettes to young people under the age of either 16 or 18. It is important to note that it is the sellers, rather than the consumers, that would be prosecuted for breaking this law, but it should reduce the demand for cigarettes over time.

Advertising bans

Eventually, many governments enacted more prohibitive rules regarding smoking, including bans on advertising. In many countries, it is no longer possible to advertise cigarette brands in the media, and some countries have even gone a step further by banning branding on packets (such as in Uruguay and Australia), and hiding cigarettes from view in shops (in the United Kingdom). This is another method that would affect the demand curve.

Smoking bans

The last major step governments have taken in legislating against tobacco is banning people from being able to smoke in public places. This includes bars, restaurants and nightclubs, but can also include all places of work, bus stops and train stations. This has helped to turn smoking into a less socially-acceptable activity.
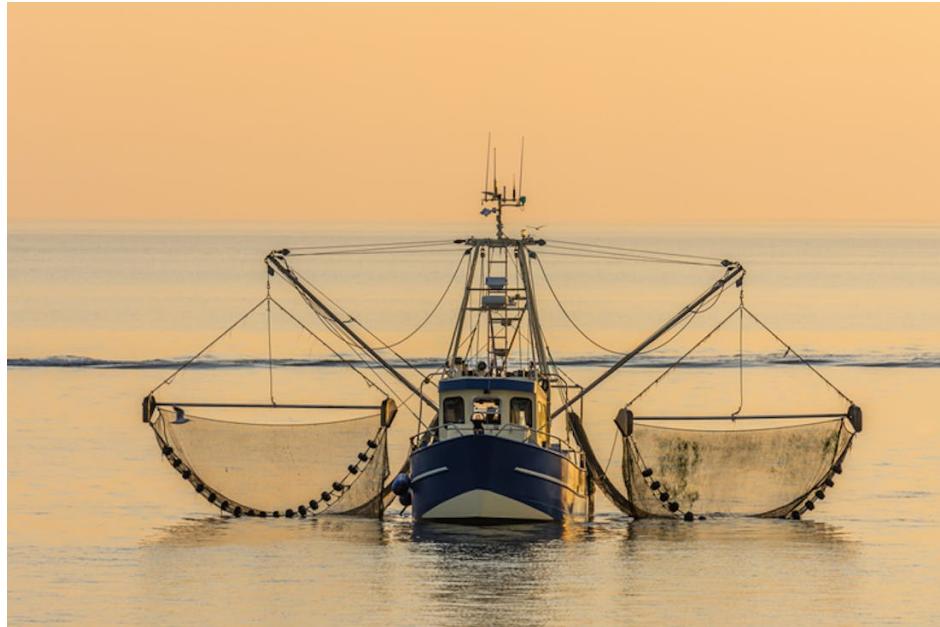
How do we manage global fish stocks?

Overfishing is becoming an increasingly big problem across the world. For reasons that will be explored more in subtopic 2.8 (/study/app/pp/sid-186-cid-754025/book/the-big-picture-id-29875/), the free market cannot efficiently allocate fish as a resource without causing

problems for future generations. This is largely due to the difficulty in deciding who owns the resource, and therefore who can exploit it. A number of command and control methods have been used to try to solve the problem.

🧳 Case study

Examples of overfishing

Figure 1. Trawler nets being used to catch fish.
Credit: Getty Images Conny Pokorny

Improved information about what constitutes a healthy diet has brought more attention to the amount of fish we eat. Salmon has become an increasingly popular fish, because of its high levels of omega 3. A lot of the salmon we buy from supermarkets is farmed salmon. The sustainability issue with salmon is that it is a carnivorous fish, and each pound of salmon produced requires the capture and processing of feed made from more than 1.5 kilograms of other fish.

Atlantic cod is a species of fish that many European countries favour for many national dishes. Cod is served in fish and chips in the UK, it is salted in Portugal and Spain to make bacalhau or bacalao, and it is used in Icelandic plokkfiskur. As a result, stocks of Atlantic cod have become depleted over time. In addition, a method of fishing called bottom trawling is used, which damages the ocean floor.

In Japan, tuna is prized as an ingredient in fresh sushi and sashimi. The auctions held early in the mornings at the old Tsukiji fish market posted records of up to USD 30 000 for one bluefin. This fish is slow to mature and as a result, stocks have diminished.

There are many other fish species that are overfished, or under threat. Take a look at the Greenpeace ⤢ (https://www.greenpeace.org/usa/oceans/sustainable-seafood/red-list-fish/)website.
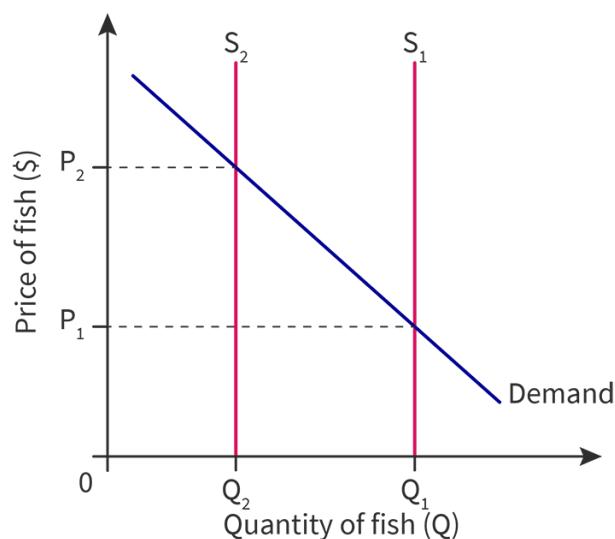
Questions to consider:

- What do you think that governments can do to manage fish stocks better?
- What would some of the strengths and weaknesses of those methods be?

Using fish quotas

The European Union has tried to reduce overfishing with the Common Fisheries Policy 🔗 (https://ec.europa.eu/fisheries/cfp_en). This policy limits the weights of fish species that individual boats are allowed to bring to shore. In theory this should reduce the problem of overfishing.

Figure 2. Quotas being used to manage fish stocks.

👁 More information for figure 2

The graph illustrates the impact of fish quotas on supply and price. The X-axis represents the quantity of fish, ranging from Q1 to Q2, while the Y-axis represents price, ranging from P1 to P2. Initially, the supply curve is vertical at S1, indicating a fixed supply. When the government reduces the quota, the supply shifts from S1 to S2, which is also vertical but represents a lower quantity. This shift results in a decrease in the quantity of fish available from Q1 to Q2 and causes the price to rise from P1 to P2. The graph visualizes this concept using two vertical lines converging towards the X-axis, illustrating the reduction in supply and the increase in price.

[Generated by AI]

Figure 2 shows how a quota system works in theory. The government limits the supply of fish species allowed to be brought to shore, which is represented by the perfectly price-inelastic (vertical) supply curve S_1. By decreasing the quotas of fish allowed from S_1 to S_2, the

government reduces the number of particular species that can be landed from Q_1 to Q_2. Prices rise from P_1 to P_2.

In practice, the nets that trawlers use do not allow fishermen to be selective with the fish species being caught. By the time the fish are sorted, the ones that are not allowed to be brought to shore have died and must be thrown back into the sea or ocean.

Restricting quantities of fish will also raise the price of those species. This has a significant impact on the ability of low-income consumers to continue to afford fish. In addition, the increased prices create an incentive to cheat the quotas, and there is the problem of piracy as a result.

⊘ Making connections

If you study Environmental Systems and Societies (ESS), you will study issues of biodiversity and management of water resources in Topic 3 (Biodiversity and conservation) and Topic 4 (Water and aquatic food production systems and societies).

Banning fishing methods

The most controversial fishing techniques are bottom trawling, the use of dynamite and the use of cyanide. These methods are often, but not always, illegal.

Bottom trawling involves dragging a big net along the bottom of the seafloor. This method indiscriminately catches all sorts of species of fish, in addition to those targeted.

The use of dynamite may seem like a shocking method of fishing, but it is quite inexpensive and effective in catching large volumes of fish. Again, it is not selective in the fish that are caught, and it is extremely damaging to the habitat.

In another method, a cyanide-based chemical is used to stun fish before catching them, usually with the aim of selling them to aquariums or the pet industry. It causes the fish to become stressed and can kill up to three quarters of the fish, and thus fails in its objective to keep fish alive.

Managing marine conservation areas

Governments can protect certain areas from fishing, and actively manage the supplies of species in those areas. By adopting a more flexible and considered approach to choosing which areas to fish, they can give the habitats a chance to replenish and recover. This is particularly effective for species that reproduce and grow quickly.

⊙ **Exam tip**

Questions about regulations have become more frequent in recent years. It is common for students to consider indirect taxes to be regulations, but technically they are not. If a student develops an answer that does not cover regulations explicitly, it cannot score top marks.

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Consumer nudges (HL)

Section   Student... (0/0)   📢 Feedback   🖨 Print   (/study/app/pp/sid-186-cid-754025/book/consumer-nudges-hl-id-31097/print/)   [Assign]

Nudge theory is a relatively new concept in behavioural economics. The idea was made popular by the book *Nudge: Improving Decisions About Health, Wealth and Happiness* by Richard Thaler and Cass Sunstein. Consumer nudges are methods of government intervention that do not fit into the traditional categories – such as indirect taxes, subsidies and legislation – that we have discussed so far. Governments or choice architects might use simple policies to help incentivise the desired behaviour in populations. Consumer nudges are different from legislation, because they give consumers the choice to behave differently.

⊗

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David Halpern - Nudge

As David Halpern explains in the video, consumer nudges usually need to employ four basic principles to be effective, which you can remember using the acronym EAST:

- They must be *easy:* consumers will not be persuaded to make any changes to their behaviour if what is being asked is difficult to accomplish.
- They must be *attractive:* consumers must be drawn to the action in some way. Perhaps visuals or clever marketing need to be used, or perhaps there must be some sort of perceived benefit for the consumer to want to complete the desired behaviour.
- They must be *social:* consumers can often be persuaded to do things that they see other people doing too. We find it very difficult to be left out!
- They must be *timely:* the timing of the intervention needs to be considered carefully. When are consumers most likely to see the intervention and in what circumstances will they be most likely to alter their behaviour?

Examples of consumer nudges include:

- Only placing healthy snacks at checkouts instead of junk food
- Plastic carrier bag charges
- Bottle deposit schemes
- Making organ donation an opt-out scheme rather than having to choose to opt-in
- Placing a target or image in the bowl of men's urinals to improve hygiene.

Methods of consumer nudges

There are three main approaches that can be used to influence people's behaviour using nudge theory:

- Providing information
- Changing the environment
- Using social norms

Providing information

When consumers are provided with particular information, they might be persuaded to act in a different way. For example, traffic light symbols on food packaging that tell consumers what the nutritional content of the food is (calories, fat, sugar and salt content) might persuade them to make healthier choices.

Changing the environment

If the situation in which consumers make their choices is changed, then they can be directed towards the desired choice. This does not just have to be the physical environment, like the examples of healthy food at checkouts, or the targets in urinals. Default options on websites can also be changed, or people could be automatically added to donor lists.

Using social norms

Knowing that other people are doing the same thing is a strong motivator of behaviour. We could provide statistics about how people typically act, or show consumers other people doing something we want them to emulate. Watch the following example of using social norms to reduce people's electricity consumption.

Social Influence on Energy Usage | Hacking Your Mind | PBS

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Advantages of consumer nudges

Consumer nudges use relatively inexpensive methods to gently nudge consumers towards the more ideal behaviours. Central to the thinking behind these methods is that consumers generally want to do the right thing, but may not have the time or the information to be able to do so.

Figure 1. Doctors in Birmingham, UK, conducting a kidney transplant.

Credit: Getty Images Morsa Images

In the case of organ donation, if you strongly wish to donate, it takes effort to put yourself on to a register. Those who have less strong opinions, but who would probably agree to donating their organs, might not make time to actively add themselves to a list. With an opt-out system, people who feel strongly about not donating can choose to opt out, but many people will stay on the list, increasing the number of potential organ donors available. .

Disadvantages of consumer nudges

Some critics of consumer nudges argue that these methods are manipulative and belittling. Not allowing people to make decisions fully on their own takes away their chance to be intelligent adults.

Nudging Better Consumer Decisions: Provide Useful Information (No...

▶

3 section questions ⌄

2. Microeconomics / 2.7 Role of government in microeconomics

Checklist

Section   Student... (0/0)   📢 Feedback   🖨 Print   (/study/app/pp/sid-186-cid-754025/book/checklist-id-31098/print/)   Assign

📋 **What you should know**

By the end of this subtopic **2.7 The role of the government in microeconomics**, you should be able to:

- Be familiar with the following economics terminology: demerit goods, price ceiling, price floor, indirect (Pigouvian) taxes, subsidy, parallel markets, non-price rationing methods, nationalisation, public goods, infrastructure, legislation, regulation, and consumer nudges.

- Explain reasons for government intervention in markets.

- Construct a price ceiling diagram.

- Analyse the consequences of implementing a price ceiling.

- Discuss the consequences of a price ceiling for different stakeholders.

- Discuss solutions to price ceilings.

- Construct a price floor diagram.

- Analyse the consequences of implementing a price floor.

- Discuss the consequences of a price floor for different stakeholders.

- Discuss solutions to price floors.

Student view

- Calculate the effects of price ceilings and price floors from diagrams.

- Construct an indirect tax diagram.

- Analyse the consequences of implementing an indirect tax.

- Discuss the consequences of an indirect tax for different stakeholders.

- Calculate the effects of indirect taxes from diagrams.

- Construct a subsidy diagram.

- Analyse the consequences of implementing a subsidy.

- Discuss the consequences of a subsidy for different stakeholders.

- Calculate the effects of subsidies from diagrams.

- Evaluate the government's ability to provide services directly.

- Distinguish between legislation and regulation.

- Discuss measures of command and control legislation and regulation.

- Evaluate examples of consumer nudges.

2. Microeconomics / 2.7 Role of government in microeconomics

Investigation

Section   Student... (0/0)   📢 Feedback   🖨 Print   (/study/app/pp/sid-186-cid-
754025/book/investigation-id-31099/print/)   [Assign]

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

This section has shown you the ways that governments can intervene in markets, and some of the reasons why they do. Housing is one market that governments often intervene in to help consumers.

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Figure 1. Public housing projects in New York City.

Getty Images Busà Photography

1. Read the following articles.

- Evicted by Matthew Desmond review – what if the problem of poverty is that it's profitable to other people?, The Guardian, 7 April 2016 [↗] (https://www.theguardian.com/books/2016/apr/07/evicted-poverty-and-profit-in-the-american-city-matthew-desmond-review)
- Sweden grapples with housing market reform as risks mount, Reuters, 18 December 2019 [↗] (https://www.reuters.com/article/sweden-economy-housing/sweden-grapples-with-housing-market-reform-as-risks-mount-idUSL8N28L43A)

2. Using the internet, find examples of countries that intervene in their housing markets in order to help consumers.

3. Create a presentation to give to your class that includes:

- An explanation of why housing requires intervention in the case you have selected. You may need to refer to the concepts of price elasticity of demand and supply here.
- An explanation, using a diagram, of the method of government intervention, and how it was intended to work.
- A discussion of the strengths and weaknesses of the policy, including an overall conclusion of the method's effectiveness

Rate subtopic 2.7 Role of government in microeconomics

Help us improve the content and user experience.

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