
A-level ECONOMICS

Paper 1 Markets and Market Failure

Time allowed: 2 hours

Materials

For this paper you must have:

- an AQA 12-page Answer Book
- a calculator.

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Write the information required on the front cover of your answer book.
The **Paper Reference** is 7136/1.
- In **Section A**, answer **EITHER** Context 1 **OR** Context 2.
- In **Section B**, answer **ONE** essay.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- There are 40 marks for **Section A** and 40 marks for **Section B**.

Advice

- You are advised to spend 1 hour on **Section A** and 1 hour on **Section B**.

Section A

Answer **EITHER** Context 1 **OR** Context 2.

EITHER

Context 1

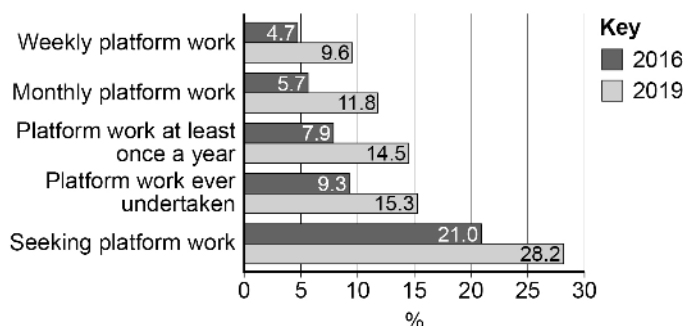
Total for this context: 40 marks

Flexible labour markets and trade unions

Study **Extracts A, B and C** and then answer **all** parts of Context 1 which follow.

Extract A

Figure 1: Participation in platform work*, % of UK workers, 2016 and 2019



Source: TUC, 2020

Note: *Platform work is defined as paid tasks that are found via a website or 'app'.

Figure 2: Median after-tax real earnings of working-age employees and the self-employed, 2009/10 to 2018/19

Year	Employed, £	Self-employed, £
2009/10	21 900	15 800
2010/11	21 300	15 100
2011/12	20 300	15 800
2012/13	20 800	14 200
2013/14	20 500	14 000
2014/15	20 900	15 800
2015/16	21 300	16 100
2016/17	21 400	16 300
2017/18	21 400	17 600
2018/19	21 600	16 500

Source: Department for Work & Pensions, 2020

Note: Base year is 2018/19

Extract B: The gig economy

The gig economy can be defined as that part of the labour market characterised by short-term contracts or occasional work, as opposed to permanent jobs. The rise of gig economy work has been driven by new technology, enabling people to work from anywhere, any time. Many self-employed people work in the gig economy through online platforms such as Uber, Deliveroo and Airbnb. These roles often replace employee roles in sectors including cleaning, taxi driving, pizza delivery, project managers and personal training. 5

Gig economy workers face higher risks and more uncertainty about the stability of their incomes than standard workers. They tend to earn less than employees doing similar work and they also tend to work longer hours. However, they do have greater flexibility and control over their work-life balance. People who have other responsibilities beyond work (for example childcare) may choose to work in the gig economy because it allows them to allocate their time as they choose. 10

The government has pledged to combat unfair working practices associated with zero-hours contracts and the gig economy. They are seeking to bring gig employers into line with the standards and regulations by which other employers must abide. However, providers of meal delivery, ride-sharing and other gig economy services warn that tighter regulations will damage economic efficiency and employees will lose out. Gig economy defenders claim that today's flexible labour markets offer modern workers the opportunity to move freely between jobs and this gives them more choice over their working hours. 15

Source: News reports, 2020

Extract C: New unions representing gig economy workers

The cleaners at St Mary's Hospital in London are members of United Voices of the World (UVW), a new trade union of mostly migrant workers whose employment is not secure. Their October 2019 strike and demonstration were typical of UVW action: joyful, noisy, confrontational and uncompromising. It was also very successful. The hospital trust increased their £8.21 minimum wage to the London Living Wage of £10.75, and decided to employ them directly, rather than via an agency for temporary workers.

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As insecure and gig economy work becomes more common, especially among migrant and young workers, new trade unions are developing to meet demand from workers in workplaces with few protections. Since it was founded in 2014, UVW has organised at more than 20 workplaces and won improved contracts, wage rises or sick pay from employers including the Daily Mail Group, the Royal Borough of Kensington and Chelsea and the London School of Economics. It now has more than 3000 members and says it is attracting 200 more every month.

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Some gig economy firms are starting to recognise workers as employees. Just Eat, which delivers takeaway food, has announced plans to offer workers benefits, including hourly wages above the minimum living wage, sick pay and pension contributions. This sets a precedent in the UK gig economy. The new drivers will be on a mix of full-time, part-time and zero-hours contracts, the company said, allowing some to retain more flexible working hours. The firm said that operating costs would rise as a result of the new scheme but Just Eat felt it was the 'right thing to do'.

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Source: News reports, 2020

0 1

Using the data in **Extract A (Figure 1)**, calculate the number of workers doing weekly platform work in 2019 for each worker doing monthly platform work in 2019.

Give your answer to **two** decimal places.

[2 marks]

0 2

Explain how the data in **Extract A (Figure 2)** show that the incentive for workers to become self-employed increased between 2009/10 and 2018/19.

[4 marks]

0 3

Extract C (lines 4–5) states that, as a result of trade union action, 'The hospital trust increased their £8.21 minimum wage to the London Living Wage of £10.75.'

With the help of a diagram, analyse how a trade union might achieve higher pay for its members.

[9 marks]

0 4

Extract B (lines 16–18) states that, 'Gig economy defenders claim that today's flexible labour markets offer modern workers the opportunity to move freely between jobs and this gives them more choice over their working hours.'

Assess the view that government intervention in the UK labour market is necessary to protect the interests of people who are working in the gig economy.

[25 marks]

Turn over ►

Do **NOT** answer Context 2 if you have answered Context 1.

OR

Context 2

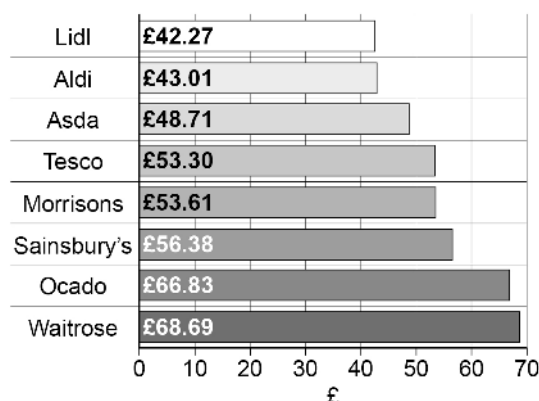
Total for this context: 40 marks

The UK supermarket sector

Study **Extracts D, E and F** and then answer **all** parts of Context 2 which follow.

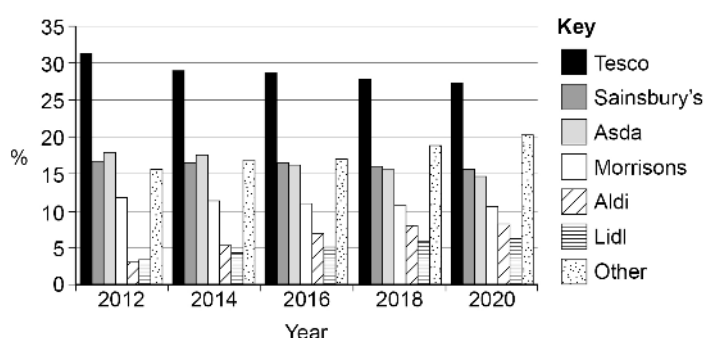
Extract D

Figure 3: Cost of a basket of 100 popular groceries, April 2020



Source: Which?, 2020

Figure 4: Market shares in the UK supermarket sector, 2012–2020



Source: Statista, 2020

Extract E: Have Aldi and Lidl reached their peak?

Aldi and Lidl, the German discount grocers which primarily sell through physical stores, have missed out as more sales have moved online. They are now trying some small scale 'click and collect' and other online options, and are hoping to win back business as the economic downturn prompted shoppers to seek out lower prices. However, industry experts say their recent rapid growth and competition from traditional supermarkets would make it harder for the discounters to take more business from rivals. The 'big four' UK supermarkets – Tesco, Sainsbury's, Asda and Morrison's – have well-established home delivery infrastructure and were able to expand online delivery dramatically during the pandemic. This led to a doubling of the online share of the overall grocery market to 13% in just a few months.

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Aldi and Lidl grew rapidly after 2008 as traditional supermarkets defended profit margins rather than sales. The discounters' combined market share in the UK grew from 4% to 14% in a decade. However, this time the traditional supermarkets are expected to put up a tougher fight. Andrew Porteous, analyst at HSBC, said the big four were "all very conscious of the mess they made of the last recession. They have done well through lockdown." "They will want to make sure they don't give people any reason to go back to split shops" he added, referring to the practice of shopping for basics at a discounter and topping up elsewhere. Supermarkets set prices interdependently, and price wars look very likely. Analysts estimate the price gap between discounters and conventional supermarkets is now about 10–12%, against more than 20% a few years ago. Tesco has pledged to match Aldi prices on key items, while Morrisons recently cut prices on 400 basics, and Asda has indicated it will not be holding back from price reductions. Competition and investment in more stores have reduced the discounters' profitability. Aldi's profit margin fell from above 5% in 2013 to just 1.75% in 2018.

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15

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Source: News reports, 2020

Extract F: Regulatory intervention in supermarkets

For decades now, economists have worried about a lack of competition between supermarkets. The sector has been dominated by a small number of large firms, led by Tesco. Sainsbury's and Asda, the second and third largest supermarket firms, attempted a merger in 2019, which would have led to a combined market share of 33%. They argued that the resulting cost savings of £1 billion per year would be passed on to consumers. However, the Competition and Markets Authority (CMA) was not persuaded, arguing that the promised price cuts would be hard to monitor, and that customers would have reduced choice for their shopping. Not only was the CMA concerned about market concentration at the national level, but also the establishment of local monopolies where some towns might have only one large supermarket to purchase groceries. They predicted lengthening queues and rising prices. In April 2019, they banned the merger.

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In 2020, the CMA ruled that Tesco had been preventing landlords from letting property to other supermarkets. This is illegal as it may reduce competition, limit choice and make consumers worse off. Nigel Howorth, a lawyer, said: "Major supermarkets have for many years sought to maintain competitive advantage over rivals through the land planning system and restrictive property arrangements."

15

Source: News reports, 2020

0	5
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Using the data in **Extract D (Figure 3)**, calculate, in percentage terms, how much more expensive a basket of groceries at Waitrose was than at Lidl in April 2020.

Give your answer as a percentage to two decimal places.

[2 marks]

0	6
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Explain how the data in **Extract D (Figure 4)** show that the supermarket sector is competitive.

[4 marks]

0	7
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Extract E (lines 16–17) states that, 'Supermarkets set prices interdependently, and price wars look very likely.'

With the help of a diagram, analyse the impact on grocery consumers of interdependence between supermarkets.

[9 marks]

0	8
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Extract E (lines 17–19) states that, 'the price gap between discounters and conventional supermarkets is now about 10–12%, against more than 20% a few years ago.'

Evaluate the view that the supermarket sector is serving customers' interests well.

[25 marks]

Turn over ►

Section B

Answer **one** essay from this section.

Each essay carries 40 marks.

EITHER**Essay 1**

The government has promised that everyone will be able to access superfast broadband by 2025. As more people have switched to studying and working remotely, good Internet connections have become more important. Low-income households have difficult choices to make between high-speed Internet and essential items such as food, heating and clothing.

0	9
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 Explain how the price mechanism allocates resources in a market economy. **[15 marks]**

1	0
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 Assess the view that high-speed Internet connection is a necessity for modern life and should be provided by the government, free of charge, to all households. **[25 marks]**

OR**Essay 2**

Markets fail for a variety of reasons and governments can play an important role in reducing the inefficiencies associated with such failures. However, Milton Friedman once suggested that “When government, in pursuit of good intentions, tries to rearrange the economy...the costs come in inefficiency, lack of motivation, and loss of freedom. Government should be a referee, not an active player.”

1	1
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 Explain the difference between complete and partial market failure. **[15 marks]**

1	2
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 Evaluate the view that government failure means that government intervention in markets will rarely lead to an improvement in economic welfare. **[25 marks]**

OR

Essay 3

Data from the Organisation for Economic Co-operation and Development (OECD) suggest that countries with very different levels of pre-tax income inequality often have similar levels of post-tax income inequality.

1	3
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Explain the main causes of inequality in the distribution of pre-tax incomes.

[15 marks]

1	4
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Evaluate whether the best way to reduce inequality in disposable income is to reduce differences in pre-tax incomes rather than through taxes and welfare benefits.

[25 marks]

END OF QUESTIONS

There are no questions printed on this page

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Question
number

0 1

Weekly platform work in 2019 = 9.6% of UK workers. Monthly platform work in 2019 = 11.8% of UK workers.

$$9.6 \div 11.8 = 0.8136$$

= 0.81 workers doing weekly platform work for each worker doing monthly platform work (0.81 : 1).

0 2

Figure 2 shows real after-tax median earnings (base year 2018/19), so the changes reflect changes in purchasing power. Between 2009/10 and 2018/19 the median real earnings of employees fell from £21 900 to £21 600, a fall of £300 (1.4%), whereas the median real earnings of the self-employed rose from £15 800 to £16 500, a rise of £700 (4.4%).

The gap between employee and self-employed earnings therefore narrowed from £6 100 to £5 100, so the premium for being an employee fell from 38.6% to 30.9% of self-employed earnings. Self-employed earnings also peaked late in the period (£17 600 in 2017/18), while employee earnings peaked at the start (2009/10). Since the relative reward from self-employment rose, the earnings a worker gives up by leaving employment to become self-employed (the opportunity cost) fell, so the financial incentive to become self-employed increased.

0 3

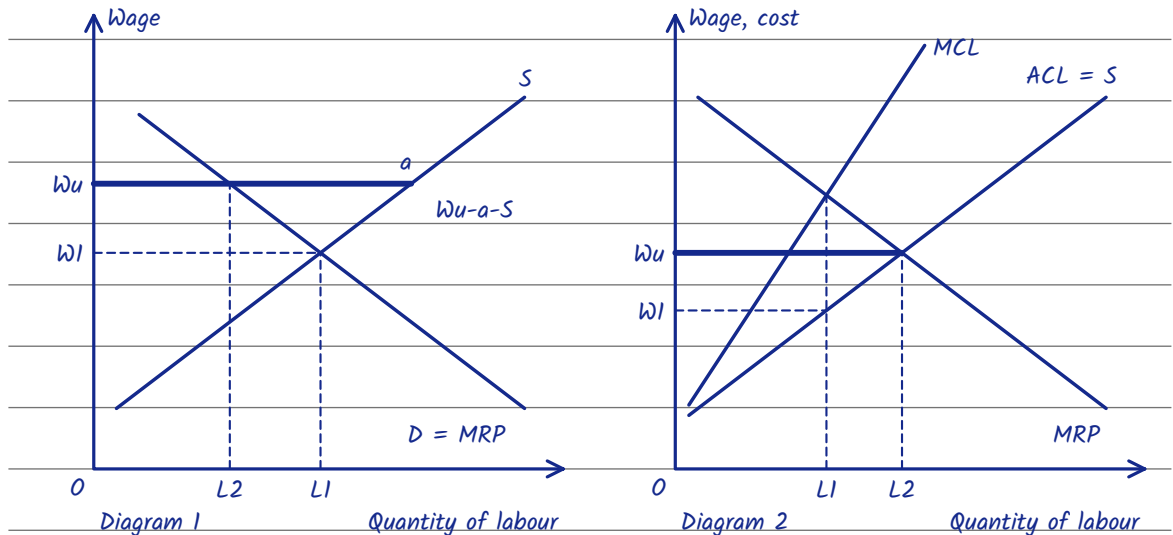
A trade union is an organisation of workers that bargains collectively with employers to improve its members' pay (wages plus non-wage benefits such as sick pay) and working conditions. Bargaining as one body, the union acts as a monopoly seller of labour, giving workers bargaining power that individual cleaners on insecure agency contracts, many of them migrants, do not have.

In a competitive labour market (Diagram 1) the wage is set where labour demand (MRP) equals supply, at W_1 (the £8.21 the cleaners were paid), with employment L_1 . If the union negotiates a wage of W_u (£10.75), the employer cannot hire any labour below W_u , so the labour supply curve it faces becomes horizontal at W_u up to point a and then follows S : the kinked curve W_u - a - S . Members who keep their jobs gain a 30.9% pay rise $((10.75 - 8.21) \div 8.21 \times 100)$.

The union wins this wage by threatening or using industrial action, which imposes

Do not write outside the box

Question
number



costs on the employer. UVW's 'confrontational and uncompromising' strike in October 2019 meant the hospital trust faced uncleaned wards and bad publicity, so conceding the London Living Wage was cheaper than a long dispute.

Work-to-rule, overtime bans, legal action and media campaigns work in the same way, and UVW's past wins (the LSE, the Daily Mail Group) and 200 new members a month make its threats more credible.

The union is most effective against a monopsony employer, such as an NHS trust hiring cleaners locally. In Diagram 2 the monopsonist employs where $MCL = MRP$ at L_1 but pays only W_1 from the ACL curve, below workers' MRP . A union wage W_u set where $ACL = MRP$ makes the MCL horizontal at W_u up to L_2 , so pay rises from W_1 to W_u and employment also rises from L_1 to L_2 , removing the exploitation without job losses.

Success is greater when demand for labour is wage-inelastic: cleaning is essential to a hospital, has few substitutes and is a small share of total costs, so the trust accepted the higher pay. Direct employment, rather than via an agency, also adds non-wage benefits, raising members' total pay further.

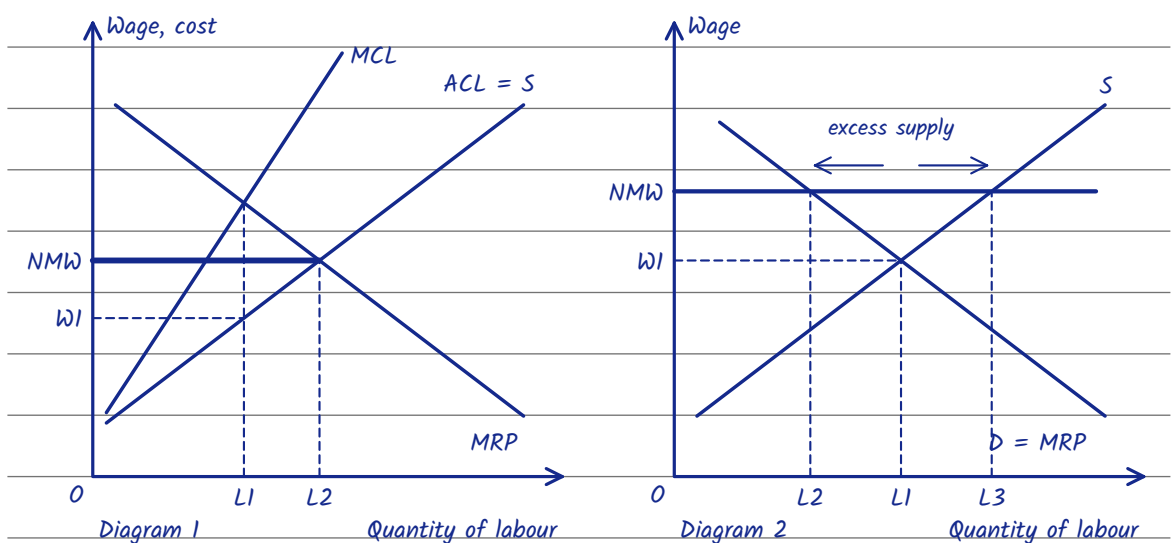
0 4

The gig economy is the part of the labour market characterised by short-term contracts or occasional work rather than permanent jobs, often found through platforms such as Uber and Deliveroo. Most gig workers are classed as self-employed, so they do not automatically receive the minimum wage, sick pay,

Do not write outside the box

holiday pay or employer pension contributions. Their interests include not only pay but also income security, working conditions and the flexibility and choice that Extract B stresses.

The case for intervention starts with unequal bargaining power. A few large platforms dominate each local market and set the piece rate per delivery or ride, while workers are numerous, often young or migrant (Extract C) and individually powerless. Platforms therefore have monopsony power. In Diagram 1 the monopsonist hires where $MCL = MRP$ at $L1$ and pays $W1$, below the MRP . A legal minimum such as the National Living Wage set at NMW , where $ACL = MRP$, raises both pay (to NMW) and employment (to $L2$). Figure 2 supports this concern: median real self-employed earnings of £16 500 in 2018/19 were £5 100 (about 24%) below employees' £21 600, and Extract B says gig workers earn less than employees doing similar work and also work longer hours.



Second, there are information failures and externalities. Gig workers bear high risks and uncertain incomes (Extract B) and may underestimate the need for sick pay, insurance and pensions, which are merit goods; without auto-enrolment many will under-save. When they fall ill or retire, the cost falls on taxpayers through Universal Credit and the state pension, an external cost that platforms do not pay. Re-classifying gig workers as 'workers' with rights to the minimum wage, holiday pay and pensions, as the 2021 Supreme Court ruling did for Uber drivers, would make platforms internalise these costs. Intervention can also be justified on equity grounds, since gig work is concentrated among low-paid, migrant and young

workers.

However, the view that intervention is necessary can be challenged. Many people choose gig work because they value flexibility: parents with childcare and students can allocate their time as they choose (Extract B), and Figure 1 shows that the share of UK workers seeking platform work rose from 21.0% to 28.2% between 2016 and 2019, while weekly platform work roughly doubled from 4.7% to 9.6%. This suggests that, for many, the gig economy offers a net benefit that regulation could destroy.

Moreover, if the gig labour market is fairly competitive, a minimum wage set above the equilibrium (Diagram 2) causes the quantity of labour demanded to contract from L_1 to L_2 while supply extends to L_3 , creating excess supply ($L_3 - L_2$). Platforms warn that tighter rules will 'damage economic efficiency' and that 'employees will lose out' (Extract B): they may cut the number of workers, impose fixed shifts and remove the flexibility workers value, or pass higher costs on to consumers, reducing demand for the services and therefore for labour.

Intervention also risks government failure. The government has imperfect information about how many hours gig workers really work and what platforms earn, employment status is hard to define in law, and enforcement against thousands of small transactions is costly. Rules designed for taxi apps may be unsuitable for personal trainers or project managers, and the law may lag behind fast-changing technology.

Finally, the market is already responding. New unions such as UVW, with over 3000 members and 200 joining a month, have won higher wages and direct employment, as at St Mary's where pay rose to the £10.75 London Living Wage. Some firms are improving conditions voluntarily: Just Eat offers hourly wages above the living wage, sick pay and pensions while keeping zero-hours options for those who want flexibility, perhaps to attract scarce workers and protect its reputation.

Nevertheless, these private responses are limited in scale. UVW's 3000 members are tiny compared with the 9.6% of UK workers (around 3 million people) doing weekly platform work, and Just Eat has admitted its scheme raises costs, so

competitors under price pressure may not follow. Without a legal floor, firms that treat workers well risk being undercut by those that do not.

In conclusion, some government intervention is necessary, but its form matters.

The strongest case is a minimum floor of rights (the minimum wage per hour worked, sick pay, holiday pay and clear employment status), because platforms

have monopsony power and the external costs of insecure work fall on taxpayers,

so a well-set floor can raise pay without large job losses. Heavy-handed rules

such as compulsory fixed contracts are not necessary and would destroy the

flexibility that many value. The right level depends on how much monopsony

power platforms have, on whether workers rely on gig work as their main income

or as a top-up, and on how far unions and firms like Just Eat improve conditions

anyway. Light-touch, well-enforced regulation that preserves flexibility is therefore

best.

Question
number

0 5

Waitrose = £68.69, Lidl = £42.27

$$(68.69 - 42.27) \div 42.27 \times 100 = 26.42 \div 42.27 \times 100 = 62.5029$$

= 62.50% more expensive at Waitrose than at Lidl.

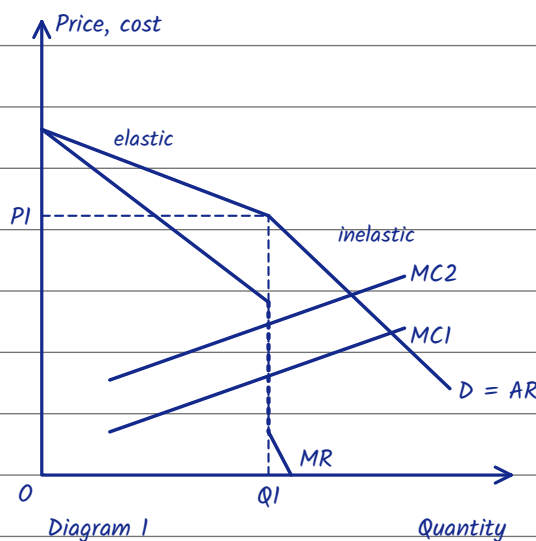
0 6

A sector is competitive when smaller firms and new entrants are able to take market share from large incumbents, because this shows that customers switch easily and that barriers to entry are low.

Figure 4 shows that between 2012 and 2020 the market share of each of the big four fell, for example Tesco's fell from about 31% to 27%, so the four-firm concentration ratio fell from about 78% (31 + 17 + 18 + 12) to 68% (27 + 16 + 15 + 10). Meanwhile the discounters gained share, Aldi's more than doubling from about 3% to 8% and Lidl's rising to about 6%, and 'other' supermarkets rose from about 16% to 20%. With six major firms plus others holding around a fifth of the market, the leaders cannot keep their customers without competing on price and quality, which shows that the sector is competitive.

0 7

Supermarkets form an oligopoly: a market dominated by a few large firms (the big four had a 68% share in 2020). Interdependence means each firm's best price depends on how its rivals react, so firms face uncertainty. The kinked demand curve model (Diagram 1) shows the effect on grocery consumers.



		Sainsbury's	
		Keep price	Cut price
Tesco	Keep	10, 10	4, 14
	Cut	14, 4	6, 6

Profits in £m (Tesco, Sainsbury's)

Diagram 2: both cut prices (price war)

Suppose the price is P1. If Tesco raised its price above P1, rivals would not follow, so shoppers would switch to Sainsbury's, Asda or the discounters and Tesco would

lose many sales: demand is price elastic above $P1$. If Tesco cut its price, rivals would match it to protect their market share, so Tesco would gain few customers: demand is price inelastic below $P1$. The demand (AR) curve is therefore kinked at $P1$ and the MR curve has a vertical gap. Costs can rise from $MC1$ to $MC2$ without changing the profit-maximising output $Q1$ or price $P1$, so prices are sticky. For consumers this brings stable, predictable prices, but prices may stay above the competitive level and firms compete mainly through non-price competition such as loyalty cards, store refits, online delivery and own-label ranges. Consumers benefit from better service and choice, though the costs of advertising and promotions are partly passed on in prices.

However, interdependence can also cause price wars. The matrix shows that cutting price is each firm's dominant strategy: whatever Sainsbury's does, Tesco earns more by cutting (£14m rather than £10m, or £6m rather than £4m), so both cut and end up at (6, 6). Extract E gives evidence: Tesco has pledged to match Aldi prices on key items, Morrisons cut prices on 400 basics and Asda will not hold back. As a result the price gap between discounters and conventional supermarkets has narrowed from over 20% to about 10 to 12%, a clear gain for shoppers, who also no longer need to 'split shop' between stores.

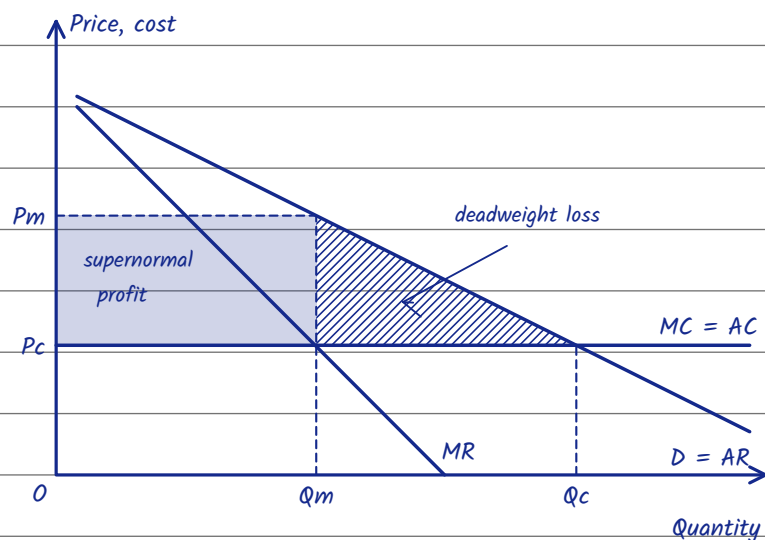
The risk is that interdependent firms recognise that price wars cut profits, as Aldi's margin fell from above 5% to 1.75%, and so have an incentive to collude, tacitly or overtly, raising prices towards the monopoly level. This is illegal and the CMA monitors it, so consumers' gains depend on rivals continuing to compete rather than cooperate.

Serving customers' interests well means delivering low prices, good quality, wide choice, convenience and good service, and continuing to innovate. The supermarket sector is an oligopoly made up of traditional big four supermarkets (Tesco, Sainsbury's, Asda and Morrisons), discounters (Aldi and Lidl), premium stores such as Waitrose and online retailers such as Ocado.

There is strong evidence that competition has intensified and that customers have benefited. The big four's combined share fell from about 78% to 68% between

2012 and 2020 (Figure 4), while the discounters' share grew from 4% to 14% in a decade (Extract E). This entry shows that barriers to entry are surmountable, so the market is fairly contestable. The traditional supermarkets have responded with lower prices: the price gap with the discounters has narrowed from over 20% to about 10 to 12%, Tesco matches Aldi prices on key items and Morrisons has cut prices on 400 basics. Customers on low incomes can buy a basket of 100 popular groceries at Lidl for just £42.27 (Figure 3).

Falling profit margins confirm that supernormal profits are being competed away: Aldi's margin fell from above 5% in 2013 to 1.75% in 2018. In the diagram, a firm with monopoly power produces where $MR = MC$ at Q_m and charges P_m , earning supernormal profit (shaded) and causing a deadweight welfare loss (hatched). Competition pushes price towards P_c where $P = MC$, at the allocatively efficient output Q_c , which is what the falling price gap suggests is happening.



Customers also benefit from dynamic efficiency and choice. The large supermarkets enjoy purchasing and distribution economies of scale which, under competitive pressure, are passed on as lower prices. They used their home delivery infrastructure to expand online shopping dramatically during the pandemic, doubling the online share of grocery sales to 13% within a few months (Extract E), showing that the sector responds quickly to changing customer needs. The range of formats, from Lidl to Waitrose (whose basket costs 62.50% more), means customers can choose the combination of price and quality they prefer.

Furthermore, the regulator protects customers when competition is threatened. The CMA blocked the Sainsbury's and Asda merger in 2019, which would have created a firm with a 33% share, because it expected higher prices, longer queues and less choice, and doubted that the promised £1 billion of cost savings would be passed on. In 2020 it also ruled against Tesco's restrictive property arrangements (Extract F).

However, there are reasons to doubt that customers are served well everywhere. The sector is still highly concentrated, with a CR4 of 68% and Tesco holding 27% of the market. Because firms are interdependent, prices tend to be sticky and there is an incentive for tacit collusion; firms may prefer non-price competition, such as loyalty schemes, to price cuts. National market shares also hide local monopolies: some towns have only one large supermarket (Extract F), where customers face higher prices and little choice. Tesco's use of the land planning system and restrictive covenants to stop landlords letting property to rivals (Extract F) shows that incumbents have deliberately raised barriers to entry against customers' interests.

The current benefits may also be temporary. The discounters mainly sell through physical stores and have missed out as sales moved online (Extract E), and their thin margins (1.75%) may limit future expansion. If price wars drive weaker firms out, or the big four regain share, concentration could rise and prices could increase again in the long run. In addition, the buying power of large supermarkets lets them squeeze suppliers such as farmers; this keeps prices low now, but may reduce quality and choice later if suppliers leave the industry.

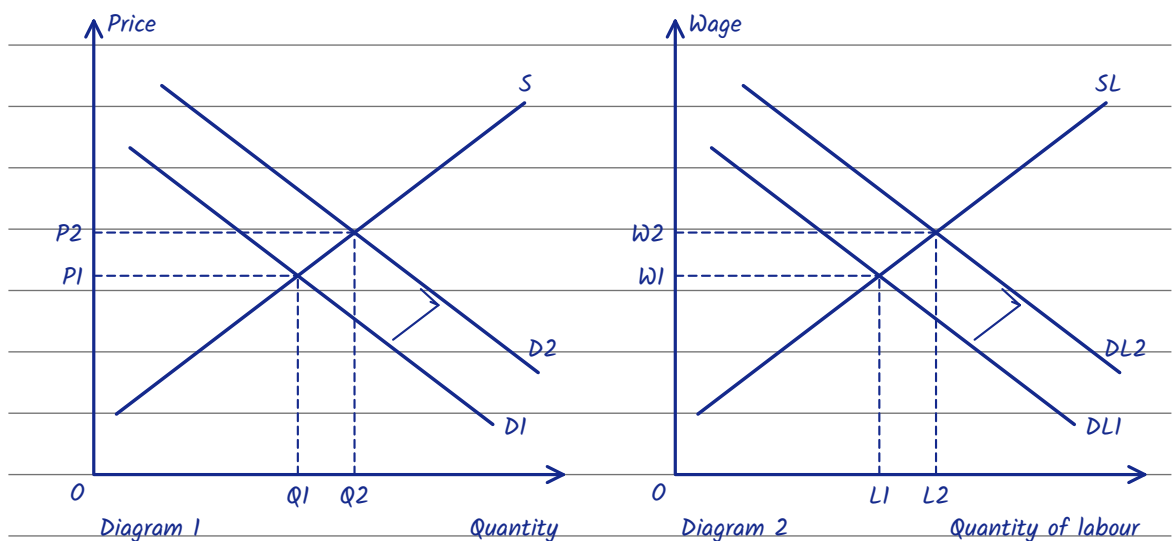
Regulation is also imperfect. The CMA intervenes only after problems arise, investigations take years, and it has limited information about local markets, so some anti-competitive behaviour, like Tesco's property restrictions which lasted 'for many years', goes unpunished for a long time. Blocking the merger may even have prevented genuine cost savings, a possible government failure.

In conclusion, the sector serves most customers well at national level. The entry of Aldi and Lidl, falling concentration, a narrowing price gap and lower margins show genuine competition, and the CMA has acted to stop mergers and practices

that would harm customers. However, the judgement depends on where customers live and what they value: customers in towns with a local monopoly, or those who rely on one convenient store, are less well served. The key condition for continued good outcomes is that the market stays contestable, which requires the discounters to keep growing and the CMA to keep acting against mergers, collusion and barriers such as restrictive land deals. Overall, customers' interests are served well, but only because of competition from the discounters and active regulation, not because of the market structure itself.

A market economy is one in which the allocation of scarce resources is decided mainly by the interaction of buyers and sellers in markets, with little government intervention. The price mechanism is the way in which changes in prices, determined by demand and supply, answer the basic economic questions of what to produce, how to produce it and for whom. Resource allocation means how scarce factors of production (land, labour, capital and enterprise) are divided between competing uses.

In each market, demand shows how much consumers are willing and able to buy at each price, and supply shows how much firms are willing and able to sell. The equilibrium price is where the quantity demanded equals the quantity supplied, P_1 and Q_1 in Diagram 1. If the price is above equilibrium there is excess supply, so firms cut prices; if it is below there is excess demand, so prices are bid up. Prices therefore move until the market clears without any central planner.



Prices allocate resources through three functions. The first is the signalling function: a change in price signals information to producers and consumers. For example, when people switched to working and studying at home, demand for high-speed Internet and laptops increased from D_1 to D_2 in Diagram 1. At the old price P_1 there is excess demand, so the price rises to P_2 , signalling to firms that consumers want more of the good.

The second is the incentive function. The higher price P_2 increases the expected profitability of supplying the good, so existing firms have an incentive to expand output and new firms to enter, and supply extends from Q_1 to Q_2 . Profit acts as

the reward that encourages entrepreneurs to move resources into the goods that consumers value most, while falling prices and losses in markets where demand has fallen, such as high-street retail, encourage firms to cut output and release resources.

The third is the rationing function. When a good is scarce, the higher price rations it among buyers: some consumers who are unwilling or unable to pay P_2 drop out, so demand contracts along D_2 and the limited supply goes to those who value it most, as measured by their willingness and ability to pay. This answers the 'for whom' question.

The price mechanism also works through factor markets and links markets together. The demand for labour is a derived demand. When the price of broadband rises, the marginal revenue product (MRP) of telecom engineers rises, so the demand for them increases from DL_1 to DL_2 in Diagram 2 and the wage rises from W_1 to W_2 . The higher wage signals a shortage and gives workers an incentive to train and move into this occupation, so labour is reallocated from declining industries to growing ones. Similarly, if a factor such as energy becomes more expensive, firms have an incentive to switch to cheaper methods of production, which answers the 'how to produce' question.

Markets are interconnected: a rise in the price of one good increases demand for its substitutes and reduces demand for its complements, so a change in one market spreads through others. Through millions of such price changes, resources are coordinated across the whole economy as if by Adam Smith's 'invisible hand', with consumer sovereignty guiding what is produced.

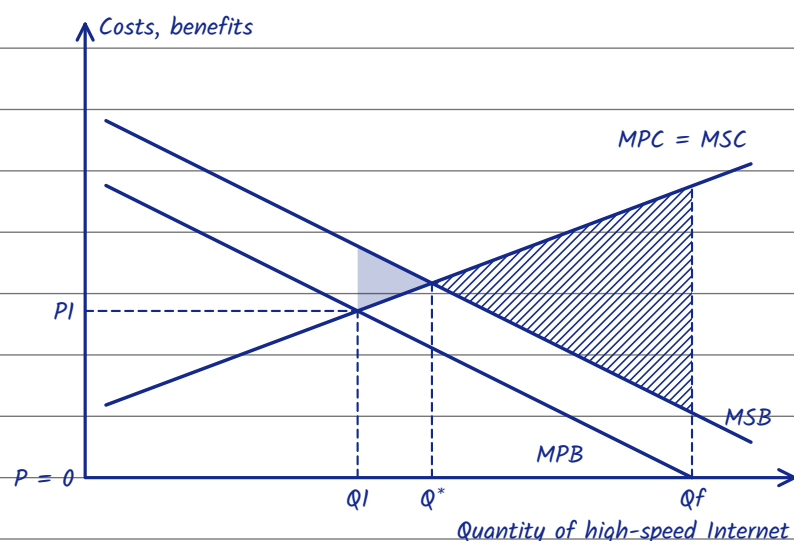
However, prices only allocate resources efficiently if markets work well. Where there are externalities, public goods, information gaps or monopoly power, prices send the wrong signals, and allocation by willingness to pay can leave low-income households unable to afford important goods, such as high-speed Internet, so the outcome may be efficient but not equitable.

Question
number

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High-speed Internet is now essential for home working, remote schooling, job applications, banking, online retail and access to public services such as Universal Credit, which must be claimed online. In the UK it is currently supplied by private firms such as BT Openreach, Virgin Media and smaller providers, with households paying a monthly price. The question is whether the market fails to the extent that the government should provide it free to everyone.

There are strong arguments that high-speed Internet is a merit good with positive externalities. A merit good is one that is under-consumed in a free market because consumers underestimate its private benefits, and which society thinks people should have regardless of ability to pay. Fast Internet allows children to complete schoolwork and adults to work from home and apply for jobs, raising human capital and productivity; these benefits spill over to third parties through higher tax revenues, lower welfare spending and a more productive economy. In the diagram, the market produces where $MPB = MPC$ at Q_I , but the socially optimal output is Q^* , where $MSB = MSC$, so there is under-consumption and a welfare loss shown by the shaded triangle.



Inequality strengthens the case. The stem notes that low-income households face difficult choices between high-speed Internet and food, heating and clothing. Without access, their children fall behind in education and adults are excluded from jobs and services, creating a digital divide that reduces social mobility. Free provision would remove this barrier completely.

There is also a supply-side argument. Building a fibre network involves huge fixed

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costs and low marginal costs, so the industry has natural monopoly characteristics: one network can supply the whole market at a lower average cost than several competing ones. Private firms have little incentive to build in rural areas where few customers live, because they would not cover their costs. A single state-owned network, as the government has promised superfast broadband for everyone by 2025, could exploit economies of scale and ensure universal coverage. However, there are strong arguments against free provision for all. Most households already buy broadband without difficulty, so making it free for everyone would mainly transfer money to people who would pay anyway: a poorly targeted and very expensive policy. The cost would have to be met from higher taxes or borrowing, which has an opportunity cost in terms of spending on the NHS or education, and higher taxes may reduce incentives to work. A zero price also removes the rationing and signalling functions of the price mechanism. In the diagram, at a price of zero consumers increase their use until MPB is zero, at Q_f , well beyond the social optimum Q^* ; between Q^* and Q_f the marginal cost to society exceeds the marginal social benefit, creating a new welfare loss (hatched area). High-speed connections are also rival at peak times, so heavy free use for streaming and gaming would cause congestion. Some Internet use, such as excessive gaming or social media, may even create negative externalities and reduce productivity, so not all consumption is merit-good consumption.

Government provision risks government failure. Without the profit motive and competition, a state provider may become X-inefficient and slow to innovate, so speeds and service quality could fall behind those of private firms. The government also lacks full information about the value households place on different speeds, so it may over- or under-invest, and large projects often run over budget and behind schedule.

Whether high-speed Internet is a 'necessity' also depends on the definition. A basic connection is a necessity for modern life, with income elasticity of demand between 0 and 1, but very high speeds for gaming or 4K streaming are closer to a luxury. This suggests government should guarantee access to an adequate

connection rather than fund the fastest speeds for all.

Alternative policies may correct the market failure more efficiently. Means-tested social tariffs or vouchers for low-income households would target help where it is needed at a fraction of the cost. Subsidies for building networks in rural areas, as under Project Gigabit, deal with the coverage problem while keeping private sector efficiency, and Ofcom can regulate prices and access to Openreach's network to prevent monopoly abuse. Free Wi-Fi in libraries, schools and other public places would also help those most excluded.

In conclusion, high-speed Internet is close to a necessity for modern life and the market does under-provide it, especially for low-income and rural households, so some government intervention is justified. However, providing it free of charge to all households would be expensive, poorly targeted, likely to cause over-consumption and congestion, and vulnerable to government failure. The best approach depends on how large the external benefits are and on how many households cannot afford access; on current evidence, targeted support (social tariffs, rollout subsidies and regulation) is more efficient than universal free provision.

Market failure occurs when the price mechanism fails to allocate scarce resources efficiently, so that economic welfare is not maximised and the outcome is not socially optimal. Market failure can be complete or partial.

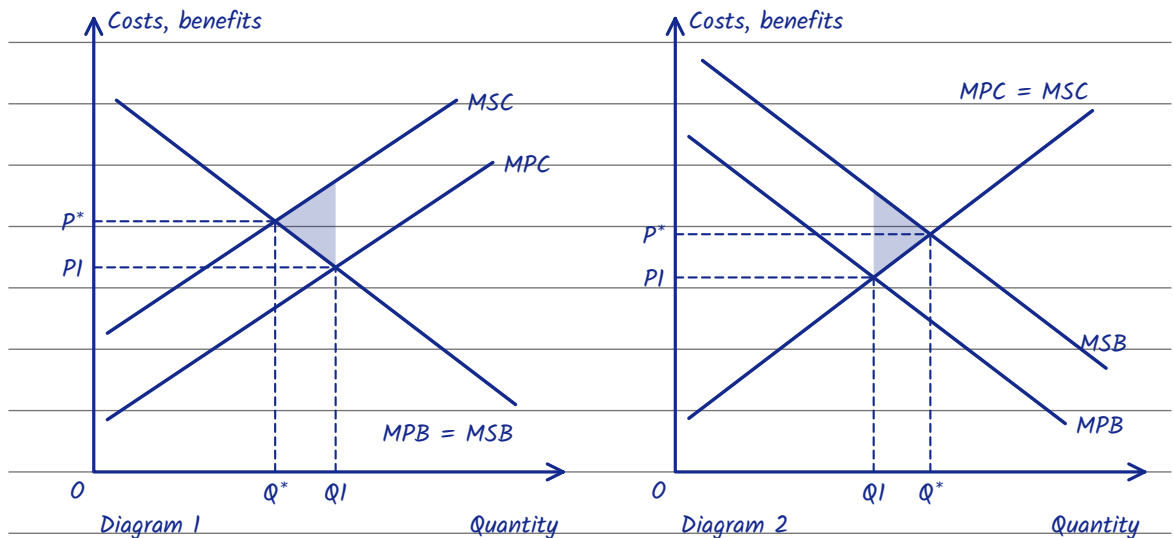
Complete market failure occurs when the market fails to supply a good or service at all, even though society wants it, so there is a 'missing market'. The main example is a public good, such as national defence, street lighting or flood defences. Public goods are non-excludable, meaning that once provided it is impossible to stop people who have not paid from benefiting, and non-rival, meaning that one person's consumption does not reduce the amount available for others. Because people cannot be excluded, each consumer has an incentive to be a free rider and enjoy the good without paying, hoping others will pay. Firms therefore cannot charge for the good and make a profit, so no private firm will supply it, even though the total benefit to society exceeds the cost. Non-rivalry also means that the marginal cost of an extra user is zero, so charging a price would not be allocatively efficient anyway.

Because the market is missing, the government normally has to provide public goods directly, financed through taxation, if they are to be provided at all.

Partial market failure occurs when a market exists and the good is supplied, but the price mechanism produces the wrong quantity or price, so too much or too little is produced and consumed. One cause is negative externalities, third-party costs not reflected in the price. In Diagram 1, a polluting firm produces where $MPC = MPB$ at Q_1 , but the marginal social cost is higher, so the socially optimal output is Q^* . The market over-produces by $Q_1 - Q^*$, causing a welfare loss (shaded).

Positive externalities cause under-provision. In Diagram 2, education creates external benefits such as a more productive workforce, so MSB is above MPB . The market produces at Q_1 where $MPB = MPC$ rather than Q^* , so there is under-consumption and a welfare loss. Merit goods, such as vaccinations, and demerit goods, such as cigarettes, also lead to partial failure because consumers have imperfect information about their true benefits or costs, so merit goods are under-consumed and demerit goods over-consumed.

Question
number



Other causes of partial market failure include monopoly power, where a firm restricts output and raises price above marginal cost so output is below the allocatively efficient level; information asymmetry, as in the used-car market where sellers know more than buyers; factor immobility, which causes unemployment of resources; and an inequitable distribution of income, which may be seen as a failure on equity grounds.

The key difference is therefore in the scale of the failure and the remedy. In complete market failure there is no market at all, so the government must provide the good itself. In partial market failure the market works but misallocates resources, so the government can correct it using taxes, subsidies, regulation or information provision while still using the market, for example a tax on pollution equal to the external cost moves output from Q1 to Q*.

The distinction is not always clear-cut. Quasi-public goods, such as roads, are partly excludable (through tolls) and partly rival (when congested), so they may be provided by the market but in too small a quantity. Technology can also turn complete failure into partial failure, as encryption made television broadcasting excludable.

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Government failure occurs when government intervention in a market leads to a net welfare loss, making resource allocation worse rather than better, or when intervention costs more than the benefit it creates. Economic welfare is the overall well-being of society, which increases when resources are allocated more

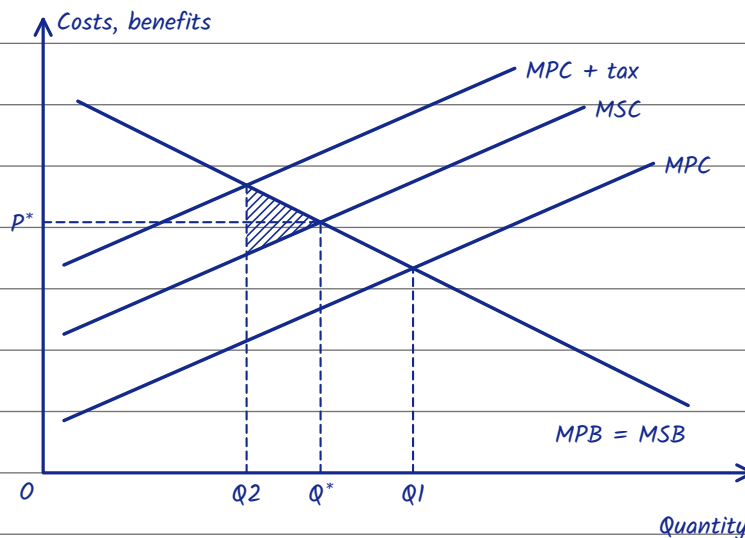
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efficiently (moving output towards the social optimum) and more equitably.

Governments intervene to correct market failures using taxes, subsidies, regulation, state provision and information.

There are many causes of government failure. The first is imperfect information.

To correct a negative externality, the government should set a tax equal to the marginal external cost, but external costs such as pollution damage are very hard to measure. In the diagram, the correct tax would shift supply to MSC and reduce output from Q_1 to Q^* . If the government overestimates the external cost and sets the tax too high, supply shifts to MPC + tax and output falls to Q_2 , below Q^* , so there is a new welfare loss (hatched) that could be larger than the original one.



Second, intervention often has unintended consequences. Landfill taxes encouraged fly-tipping, high taxes on cigarettes encourage smuggling, and rent controls reduce the supply of rented housing, causing shortages. Third, regulatory capture can occur when regulators come to act in the interests of the firms they regulate rather than consumers. Fourth, public choice theory suggests that politicians pursue votes and their own interests, choosing short-term policies before elections rather than ones that maximise long-run welfare. Bureaucracy, administrative costs and conflicting objectives add to the problem, and large projects such as HS2 have gone far over budget and behind schedule. The EU Common Agricultural Policy, which created food surpluses such as 'butter mountains', shows how intervention can cause persistent inefficiency. This supports Friedman's view that

government 'should be a referee, not an active player', because intervention brings 'inefficiency, lack of motivation, and loss of freedom'.

In addition, some apparent market failures stem from earlier government interventions, and some are resolved without government. Technology has made many goods excludable and markets more transparent, for example online review sites reduce information asymmetry, so intervention may be unnecessary.

However, the view that intervention will 'rarely' improve welfare is too strong. For complete market failure, such as public goods like defence, street lighting and flood defences, the free market supplies nothing at all, so government provision almost always increases welfare even if it is inefficient. There are also many clear successes in partial market failure: taxes on cigarettes, advertising bans and the smoking ban have greatly reduced smoking, the 5p plastic bag charge cut single-use bag use in large supermarkets by over 90%, the sugar tax led manufacturers to reformulate drinks, and the Clean Air Acts ended the London smogs. The NHS and free education improve welfare by addressing merit goods and inequality.

The extent of government failure depends on the type of intervention and how well it is designed. Market-based policies such as tradable pollution permits use the price mechanism and need less information than direct controls, so they are less likely to fail. Independent bodies such as the Competition and Markets Authority and the Bank of England reduce the risk of political short-termism. Policies can be reviewed and adjusted as information improves, as tax rates can be changed if the outcome is not as expected, so an initial government failure need not be permanent.

It also depends on the relative size of market failure and government failure. Intervention improves welfare whenever the welfare gain from correcting the market failure is greater than the welfare loss from government failure. Where the market failure is large, such as climate change or a pandemic, even imperfect intervention is likely to leave society better off than doing nothing. Where the market failure is small, or information is very poor, the costs of intervention may outweigh the benefits and leaving the market alone may be best.

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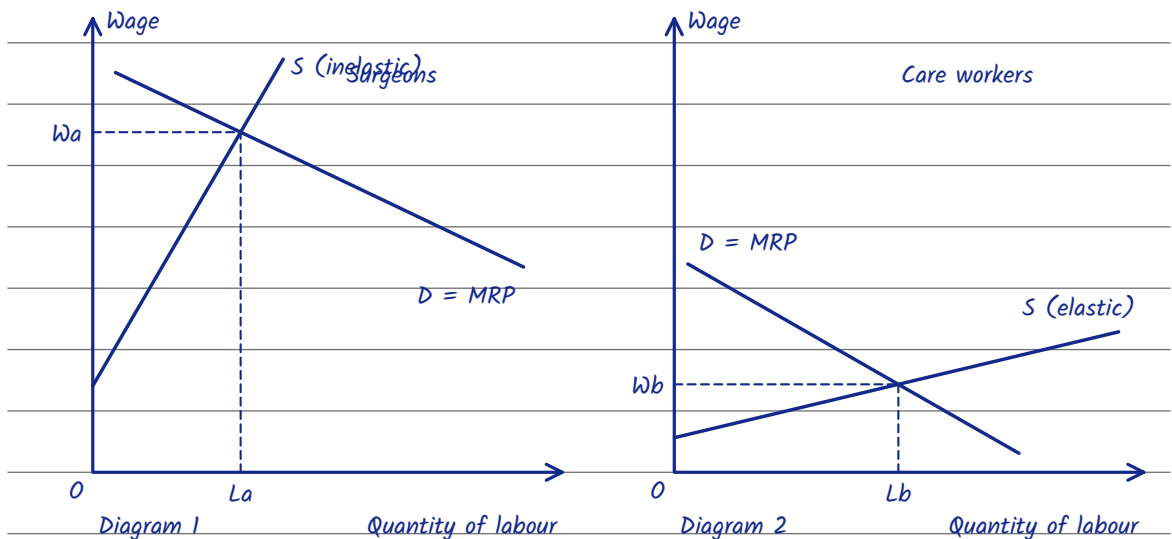
Answer pages

In conclusion, government failure is a real risk and means that intervention does not always improve economic welfare, so governments should intervene carefully, using well-designed, flexible and preferably market-based policies. However, it is wrong to say intervention will 'rarely' improve welfare: for public goods, large externalities and merit goods there are many cases where intervention has clearly increased welfare. Whether intervention improves welfare depends on the size of the market failure, the quality of information and the design of the policy, so the case should be judged market by market.

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Income inequality refers to unequal distribution of income between individuals or households in an economy. Pre-tax (gross) income is income before direct taxes are deducted and before welfare benefits are added. It includes earned income from wages and salaries and unearned income from owning wealth: rent, interest and dividends from profits. Inequality in pre-tax income is shown by a Lorenz curve and measured by the Gini coefficient; differences in each source of income cause inequality.

The most important cause is differences in wages in labour markets. In a competitive labour market the wage is determined by the demand for labour, which depends on the marginal revenue product (MRP) of labour, and the supply of labour. Workers with scarce skills, such as surgeons, have a high MRP and their supply is inelastic because training takes many years, so wages are high (W_a in Diagram 1). Low-skilled workers, such as care workers, have a lower MRP and an elastic supply because many people can do the job, so wages are low (W_b in Diagram 2).



Differences in MRP partly reflect differences in human capital. People with more education and training are more productive, so they earn more, and inequality of opportunity from an early age, through differences in schools, health, nutrition and family background, means that some people never acquire the skills that are in high demand. Technological change has also been skill-biased, raising demand for graduates while reducing demand for routine jobs, and globalisation has increased competition for low-skilled workers in the UK.

Imperfections in labour markets cause further inequality. Workers in strong trade unions or protected professions can raise their pay above the competitive level, while monopsony employers can pay below the MRP. Discrimination by gender, ethnicity, age or disability means some groups are paid less or are excluded from higher-paid jobs, for example the gender pay gap. Geographical immobility, due to high housing costs in London and the South East, and occupational immobility prevent workers moving to better-paid jobs, so regional differences persist.

Information asymmetry also means some workers do not know about better opportunities.

Differences in the number of hours worked matter too: part-time, zero-hours and gig workers earn far less than full-time employees, while some households have no one in work. Earnings also vary over the life cycle, being low for young people and higher in middle age.

Another major cause is the unequal distribution of wealth. Wealth is a stock of assets such as property, shares and land, and it generates a flow of income as rent, interest and dividends. Because wealth is much more unequally distributed than income and is often inherited, those who own wealth receive large unearned incomes, while those with no wealth rely entirely on earnings. In addition, the very highest earners, such as chief executives and top footballers, benefit from 'winner takes all' markets in which small differences in talent lead to huge differences in pay. Monopoly power in product markets also allows large firms to earn supernormal profits, much of which is paid out as dividends to wealthy shareholders.

Overall, pre-tax income inequality is caused mainly by differences in the demand for and supply of different types of labour, by labour market imperfections and discrimination, and by the unequal ownership of wealth.

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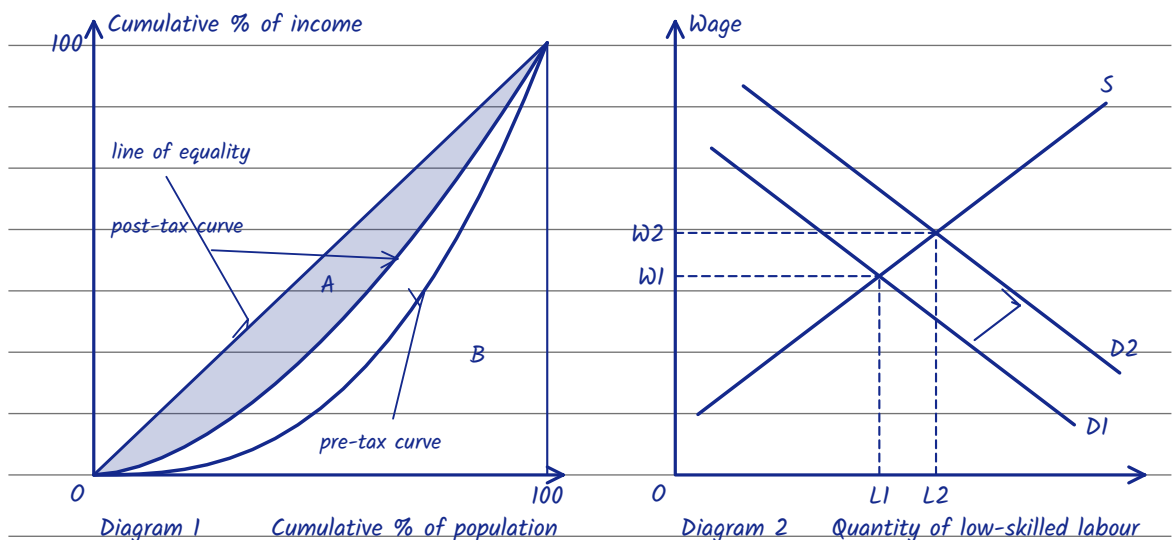
Disposable income is the income a household has to spend or save after direct taxes such as income tax and national insurance have been deducted and cash welfare benefits added. Pre-tax income is income before taxes and benefits. Inequality in disposable income can therefore be reduced either by reducing

differences in pre-tax incomes ('pre-distribution') or by redistributing income through taxes and benefits. The OECD data in the stem suggest that countries with very different pre-tax inequality often reach similar post-tax inequality, which shows how powerful the tax and benefit system can be.

The case for using taxes and benefits is that they work directly and quickly. A progressive income tax, where the marginal rate rises from 20% to 40% to 45% as income rises, takes a larger proportion of income from the rich, and

means-tested benefits such as Universal Credit raise the incomes of the poorest.

In the UK, taxes and benefits reduce the Gini coefficient from roughly 0.5 for original income to about 0.35 for disposable income. In the Lorenz curve diagram, redistribution moves the curve from the pre-tax curve towards the line of equality (the post-tax curve), reducing the Gini coefficient, $A \div (A + B)$. The system can also be targeted at particular groups, such as children or pensioners, and can be changed in each Budget.



However, taxes and benefits can have significant disadvantages. High marginal tax rates may reduce the incentive to work, invest and take risks, and, as the Laffer curve suggests, very high rates may even reduce tax revenue as people avoid or evade tax or emigrate. Means-tested benefits withdrawn as income rises create a poverty trap: under Universal Credit the 55% taper means a low-paid worker keeps less than half of each extra pound earned. Redistribution also costs a great deal: welfare spending is one of the largest parts of government spending, so it has an opportunity cost in terms of spending on health or education. Most importantly,

redistribution treats the symptoms rather than the causes of inequality, so it has to be repeated every year.

Reducing differences in pre-tax incomes tackles the causes. Improving education and training for low-skilled workers raises their productivity and MRP, so the demand for their labour increases from $D1$ to $D2$ in Diagram 2 and their wage rises from $W1$ to $W2$. Better early-years education, apprenticeships and equal access to health care improve equality of opportunity and social mobility, and the gains are permanent and increase the productive capacity of the economy, raising tax revenue in the long run. Unlike taxes, this approach improves incentives rather than weakening them.

Labour market policies can also reduce pre-tax inequality. The National Living Wage has raised the pay of the lowest earners substantially, and in monopsony labour markets a minimum wage can raise both wages and employment.

Anti-discrimination laws, gender pay gap reporting, stronger trade unions and policies to reduce monopsony power all reduce unjustified pay differences, while competition policy against monopoly limits supernormal profits paid out as dividends to the wealthy.

However, pre-distribution policies also have limitations. Education and training take many years, even decades, to affect incomes, so they cannot help people who are poor now, and their success is uncertain because better-off families also invest more in their children. If a minimum wage is set above the equilibrium in a competitive labour market, it can cause unemployment among the low-skilled, which increases inequality. Pre-tax policies also cannot easily deal with households where no one can work, such as the disabled, carers and pensioners, who need benefits. Finally, much inequality comes from unearned income on inherited wealth, and maximum wage or pay ratio policies risk causing skilled workers to move abroad, so taxes on wealth and high incomes may still be necessary.

The best approach also depends on the cause of inequality and the time period. Where inequality is caused by differences in skills and opportunity, pre-distribution is likely to be more effective and sustainable in the long run. Where it is caused by inability to work, wealth or short-term shocks, such as the pandemic, the tax

and benefit system is essential. It also depends on how much inequality society is willing to accept, since some inequality provides incentives to work and take risks, and on the government's budget position.

In conclusion, reducing differences in pre-tax incomes is the better long-term way to reduce inequality, because it tackles the causes, raises productivity and avoids the disincentive effects and fiscal costs of high taxes and benefits. However, it is slow, uncertain and cannot help everyone, so it is not sufficient on its own. As the OECD evidence shows, taxes and benefits are a powerful and immediate way to reduce inequality in disposable income. The best strategy is therefore a combination: pre-distribution through education, training and fair labour markets to reduce inequality over time, supported by a progressive tax and benefit system that is designed to minimise disincentives.