

A-level ECONOMICS

Paper 1 Markets and Market Failure

Wednesday 15 May 2024

Morning

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

The market for university accommodation

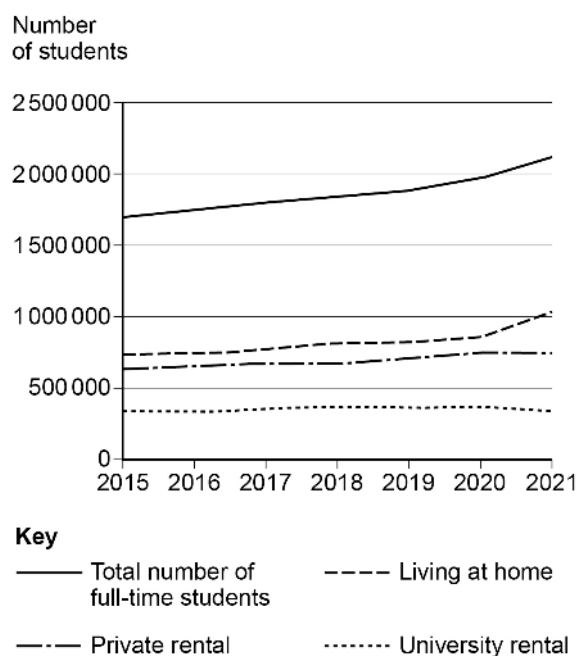
Study **Extracts A, B and C** and then answer **all** parts of Context 1 which follow.

Extract A

Table 1: Average weekly university rent, selected UK cities, 2015 and 2021

Selected UK cities	Average weekly university rent, 2015	Average weekly university rent, 2021
Birmingham	£113.88	£157.94
Brighton	£143.00	£235.93
Bristol	£141.58	£184.38
Liverpool	£112.97	£136.61
Manchester	£120.87	£180.60
UK average	£121.16	£169.35

Figure 1: Number of full-time students at UK universities, and type of accommodation, 2015 to 2021



Source: Cushman Wakefield Student Accommodation Report, 2022

Extract B: A serious shortage of student accommodation

The number of 18-year-olds in the UK applying to university is rising. In addition, there was a record number of 277 000 foreign students in 2022.

Universities have expanded the number of places on offer to students, but the supply of student accommodation is highly inelastic. Providers of rental accommodation have been deterred by stricter rules on shared houses, higher taxes and greater rights for renters. Rising construction costs, interest rates and inflation have resulted in an insufficient number of new developments in many university cities. Supply shortages have been particularly acute in some cities, and certain universities have asked students to live at home.

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Shortages of accommodation could mean that some students are discouraged from applying to university. The average private sector rent outside London consumes almost three-quarters of the maximum student loan, and most students are ineligible for this maximum. Some of the top universities may become out of reach to poorer students who do not live locally.

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Source: News reports, 2023

Extract C: Policies to solve the shortage of student accommodation

The causes of the shortage of student accommodation are varied and some, but not all, result from market failure. Rising rents ought to incentivise more supply, but that has not worked recently. Planning restrictions have limited the number of new building projects. Relaxing such rules might help, but local residents complain that high numbers of students can alter the nature of their communities. Subsidies to the builders of student accommodation could increase supply, but with a likely delay of many years.

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Some students have been offered financial incentives to defer their entry by a year or to live at home. To reduce further the demand for student accommodation, some people have urged the government to restrict foreign student numbers. However, the 22% of students who are foreign pay 44% of all tuition fees and so subsidise costs for UK students.

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Policies to tackle high rents could include rent subsidies from the government or an increase in the grants and loans available to students. In Scotland, university students have benefited from controls which limit rent increases to a fixed percentage each year. The National Union of Students is calling for nationwide rent controls. A maximum rent can help keep the cost of student accommodation lower than it would otherwise be, but risks some landlords withdrawing from the market. Some argue that high-quality student accommodation is a merit good and ought to be provided by the government at a fair rent.

15

Source: News reports, 2023

0 1 Inflation resulted in a basket of goods and services that cost £100 in 2015 costing £112 in 2021. Using this information and the data in **Extract A (Table 1)**, calculate the percentage increase in average university rent, in real terms, between 2015 and 2021.

Give your answer to **one** decimal place.

[2 marks]

0 2 Explain how the data in **Extract A (Figure 1 and Table 1)** show that the supply of university and private rental accommodation has failed to match the increase in student numbers between 2015 and 2021.

[4 marks]

0 3 **Extract B** (lines 3–4) states that ‘Universities have expanded the number of places on offer to students, but the supply of student accommodation is highly inelastic’.

With the help of a diagram, explain the impact of the increase in the number of students attending university on the market for student accommodation.

[9 marks]

0 4 **Extract C** (lines 14–16) states that ‘A maximum rent can help keep the cost of student accommodation lower than it would otherwise be, but risks some landlords withdrawing from the market’.

Using the data in the extracts and your knowledge of economics, discuss the advantages and disadvantages of policies the government might introduce to improve the market for student accommodation.

[25 marks]**Turn over ►**

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

OR

Context 2

Total for this context: 40 marks

Trade union membership and industrial disputes

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

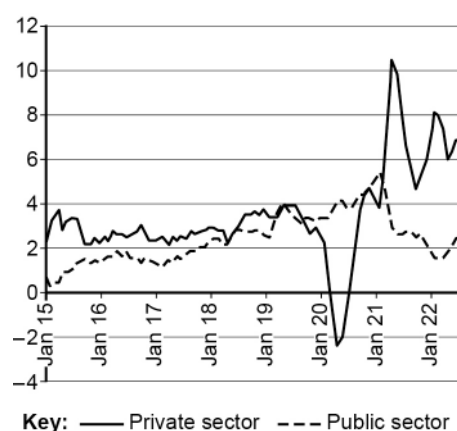
Extract D

Table 2: Trade union membership, % of workforce, 2001 to 2021

Year	All employees	Private sector	Public sector
2001	29.3	18.4	59.7
2006	28.3	16.6	58.7
2011	26.0	14.2	56.6
2016	23.5	13.4	52.8
2021	23.1	12.8	50.1

Source: Department for Business, Energy and Industrial Strategy, 2022

Figure 2: Growth in average annual nominal earnings, %, January 2015 to September 2022



Source: Office for National Statistics, 2023

Extract E: UK public sector workers hit hardest by cost of living crisis

In November 2022, members of nursing trade unions voted to strike. Many more public sector unions have joined the nurses on strike, in attempts to gain pay rises that keep up with inflation. It is notable that many of the employers facing strike action, such as the NHS, are monopsonistic employers, who have considerable labour market power.

UK public sector workers have been particularly hard hit by the cost of living crisis, according to official figures that show the gap between public and private sector pay growth is at its widest on record. Annual growth in pay was 6.6% in the private sector in September 2022, compared with just 2.2% for the public sector. Overall, pay growth accelerated to 5.7% as employers struggled to hire workers due to low unemployment. In November 2022, 13.3% of businesses reported experiencing a shortage of workers leading to upward pressure on wages. The construction and hospitality sectors were worst affected.

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However, wage growth has not kept pace with inflation, which reached 10.1% in September 2022, leading to growing industrial unrest. Until recently, strikes largely affected local authorities, transport services and some private sector employers. But the latest figures show the pay squeeze has been far worse for teachers, NHS staff and other public sector workers who have started to take industrial action, including strikes. Louise Murphy, economist at the Resolution Foundation, said there was now a “huge wedge” between private and public sector pay, creating severe difficulties for public sector recruitment and retention. Staff shortages in the public sector are likely to worsen unless public sector pay and working conditions improve.

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Source: News reports, 2023

Extract F: The role of trade unions

Over the past century, British unions have successfully campaigned for a minimum wage, holiday and sickness pay, equal opportunity rights, maternity and paternity rights and a two-day weekend for workers. Unions support individual workers in workplace disagreements, and engage in collective bargaining on behalf of their members by negotiating with employers on pay and working conditions. But unions can do much more for employees and even for employers. Research shows that their benefits can include reducing staff turnover, providing or promoting training and encouraging innovation.

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UK trade union membership peaked at 13.2 million members in 1979 but fell consistently during the 1980s and 1990s. There has been a recent reversal of this trend with membership increasing in each of the last four years, primarily amongst public sector workers. Unions suggest that new members have been joining due to wages falling in real terms, and the hope that a trade union might protect their interests. Collective pay bargaining, reinforced by the threat of strikes, has achieved some notable successes for workers, such as the 18% pay rise for London bus drivers in February 2023. However, 205 000 working days were lost to strike action in September 2022, almost as many as in the whole of 2019. Critics argue that strikes by transport workers, teachers, nurses and others create enormous disruption for everybody else and make labour markets less efficient.

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Source: News reports, 2023

0 5

Using the data in **Extract D (Table 2)**, calculate the difference between the mean percentage trade union membership in the private sector and the mean percentage trade union membership in the public sector over the period 2001–2021.

Give your answer to **one** decimal place.

[2 marks]

0 6

Explain how the data in **Extract D (Figure 2)**, show that, since 2015, living standards of people working in the private sector are likely to have increased compared to those working in the public sector.

[4 marks]

0 7

Extract E (lines 9–10) states that ‘In November 2022, 13.3% of businesses reported experiencing a shortage of workers leading to upward pressure on wages’.

With the help of a diagram, explain how **and** to what extent a shortage of labour is likely to affect the wage in a competitive labour market.

[9 marks]

0 8

Extract F (lines 12–13) states that ‘Collective pay bargaining, reinforced by the threat of strikes, has achieved some notable successes for workers’.

Using the data in the extracts and your knowledge of economics, evaluate the view that trade unions improve the operation of labour markets by protecting the interests of workers.

[25 marks]

Turn over ►

Section B

Answer **one** essay from this section.

Each essay carries 40 marks.

EITHER**Essay 1**

In the UK, 64% of the population are considered to be overweight. Many policies have focused on promoting active lifestyles, whilst taxes have been introduced on sugary drinks and alcohol. There has also been regulation of advertising aimed at young children. Attention has recently turned to the use of behavioural economics techniques to change diets.

0	9
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Explain why imperfect and asymmetric information may lead to market failure in the market for food.

[15 marks]

1	0
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Evaluate the view that the consumption of unhealthy foods can best be reduced through the use of nudges and other techniques from behavioural economics.

[25 marks]

OR**Essay 2**

In 2018, the Competition and Markets Authority issued a report which criticised a 'situation where businesses charge higher prices to existing customers who stay with them, than they do to new customers'. However, according to Citizens Advice, some broadband and mobile phone companies continue to charge existing customers more than they charge new customers.

1	1
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Explain the likely impact on consumer surplus and producer surplus as an industry moves away from a competitive market structure to one that is dominated by a few large firms.

[15 marks]

1	2
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Evaluate the view that price discrimination is damaging for consumers.

[25 marks]

OR

Essay 3

Britain's energy market was plunged into chaos in 2021 as surges in wholesale electricity and gas prices exposed the weaknesses of many companies. Since deregulation in 2016, 49 energy supply companies have collapsed, with customers taken on by larger firms. This market chaos has led to renewed calls for the government to nationalise the energy industry.

1	3
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Explain, using examples, how the existence of economies and diseconomies of scale affect firms' average costs of production.

[15 marks]

1	4
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Assess the view that privatised industries, such as electricity and gas, should be taken back into public ownership.

[25 marks]

END OF QUESTIONS

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Question
number

0 1

Nominal increase = $(169.35 - 121.16) \div 121.16 \times 100 = 39.8\%$

Real terms: $169.35 \div 121.16 \times (100 \div 112) = 1.24798$

$(1.24798 - 1) \times 100 = 24.8\%$ real increase in average university rent

0 2

Figure 1 shows that the total number of full-time students rose from about 1.7 million in 2015 to about 2.1 million in 2021, an increase of roughly 400 000

(about 24%). Over the same period the number in university rental

accommodation hardly changed, staying at around 330 000 to 350 000, while private rental rose only slightly, from about 650 000 to about 750 000.

So rented accommodation grew by only about 100 000 places, leaving a shortfall of around 300 000. This is matched by the rise in students living at home, from about 750 000 to just over 1 million, many of whom may have had no choice.

Table 1 confirms that supply has not kept up with demand: the UK average weekly university rent rose from £121.16 to £169.35, a nominal rise of 39.8% (24.8% in real terms). Rising rents are the price signal of excess demand, so supply has failed to match the increase in student numbers.

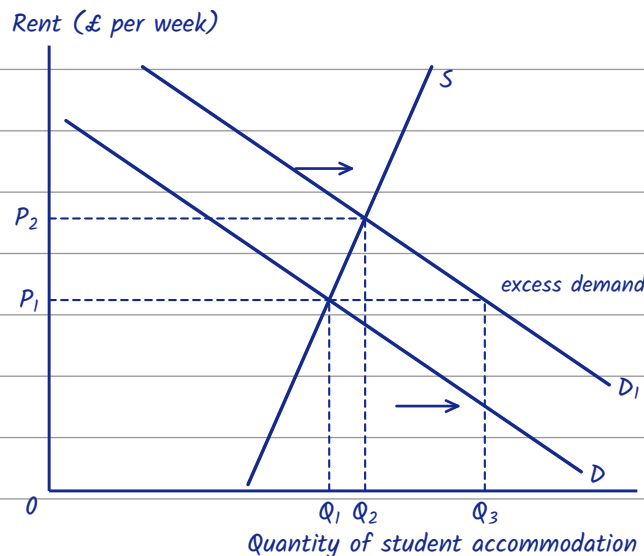
0 3

Demand is the quantity of a good that consumers are willing and able to buy at each price; supply is the quantity producers are willing and able to sell at each price. Price elasticity of supply (PES) measures the responsiveness of quantity supplied to a change in price. Supply is highly inelastic when PES is well below 1, so a rise in rent leads to a proportionately much smaller rise in the quantity of accommodation supplied.

Student numbers are rising because demographic change means more UK 18-year-olds are applying and because there was a record 277 000 foreign students in 2022 (Extract B). A university place and student accommodation are in joint demand (complements), so as universities expand places, demand for accommodation rises at every rent. As shown in the diagram, demand shifts right from D to D_1 .

At the original rent P_1 there is now excess demand of Q_1Q_3 : more students want rooms than are available. Students compete for scarce rooms and landlords can

Do not write outside the box



charge more, so rent is bid up. The higher price performs the rationing function, pricing out some students who then live at home, and the signalling and incentive functions, encouraging providers to supply more rooms.

However, because supply is highly inelastic, the quantity supplied rises only slightly, from Q_1 to Q_2 , while rent rises steeply from P_1 to P_2 . Supply is inelastic because new halls take years to plan and build, land in city centres is scarce, planning restrictions limit new projects, and rising construction costs, interest rates and inflation have deterred developers (Extract B). Stricter rules on shared houses, higher taxes and greater renters' rights have also discouraged private landlords. This fits Extract A: UK average weekly rent rose by 39.8% between 2015 and 2021 while university rental places barely changed.

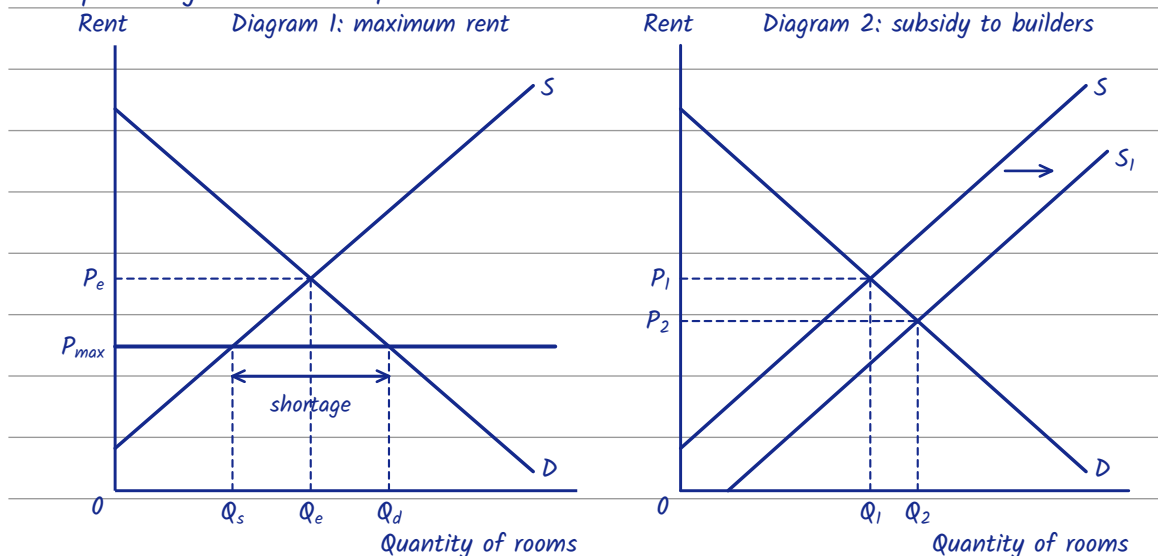
The impact therefore falls mainly on price rather than quantity: much higher rents, persistent shortages in some cities and more students forced to live at home. In the long run supply becomes more elastic as new developments are completed, so the rise in rent may partly reverse, but only if planning rules and building costs allow. Meanwhile, rents taking almost three-quarters of the maximum student loan may put top universities out of reach for poorer students.

0 4

The market for student accommodation brings together students who demand rooms and the universities and private landlords who supply them. In a well-functioning market a shortage would be self-correcting: higher rents signal scarcity, ration the existing rooms and give providers an incentive to build more.

Extract C notes that 'rising rents ought to incentivise more supply, but that has not worked recently', because supply is highly inelastic. With rents up 39.8% between 2015 and 2021 and around 300 000 extra students living at home (Extract A), the market is not delivering an efficient or equitable outcome. Some of the problem is market failure. A university education is a merit good with positive externalities, such as a more productive workforce and higher tax revenue, and decent student housing is arguably a merit good too. If high rents deter poorer students, both are under-consumed and social mobility falls, an inequitable outcome. Land is also geographically immobile, so supply cannot move to where demand is. Other causes are not market failure at all: planning restrictions and local objections are partly government failure. The government's objectives are therefore to increase supply, reduce rents and protect access for poorer students, and each policy should be judged against these aims.

The first policy is a maximum rent (rent control), as used in Scotland and demanded by the National Union of Students. In diagram 1 a maximum rent P_{max} is set below the equilibrium P_e . Students who get a room pay less, so their real income rises and university becomes more affordable, helping equity. Because supply is very inelastic in the short run, the fall in quantity supplied is small, so a cap mainly transfers surplus from landlords to students.



However, as Extract C warns, a maximum rent 'risks some landlords withdrawing from the market'. Quantity supplied contracts from Q_e to Q_s while quantity demanded extends to Q_d , so the shortage widens to $Q_s Q_d$. Rooms must be

rationed by non-price means such as queues or luck, landlords may cut maintenance so quality falls, and illegal side payments may appear. In the long run supply is more elastic, so the reduction in supply and investment in new halls could be large, making the original problem worse. A cap on annual increases, as in Scotland, is less damaging than a cap on the level of rents, but still weakens the incentive to build.

A second policy is a subsidy to the builders of student accommodation. In diagram 2 this lowers costs and shifts supply right from S to S_1 , so quantity rises from Q_1 to Q_2 and rent falls from P_1 to P_2 . Unlike rent control, this tackles the root cause, the lack of rooms. Its disadvantages are the opportunity cost to the taxpayer and, as Extract C says, 'a likely delay of many years'. If planning restrictions are the binding constraint, a subsidy may simply raise developers' profits without much extra building, a form of government failure.

A third option is to relax planning restrictions. This makes supply more elastic at little cost to the government. However, local residents complain that large numbers of students 'alter the nature of their communities', so there are negative externalities such as noise and pressure on local services. A sensible compromise is to allow purpose-built blocks near campuses rather than more shared houses in residential streets.

Fourth, the government could boost demand-side support through rent subsidies or larger grants and loans. This directly helps poorer students, given that the average private rent outside London takes almost three-quarters of the maximum loan (Extract B). Yet with highly inelastic supply, extra purchasing power shifts demand further right, so much of the subsidy is likely to be captured by landlords as higher rents, with little extra accommodation. It is also costly. Means-tested support targeted at the poorest students would be more efficient than a universal subsidy.

Fifth, policies could reduce demand, for example by paying students to defer entry or live at home, or by restricting foreign student numbers. This would ease the shortage quickly. However, foreign students are 22% of students but pay 44% of tuition fees, effectively subsidising UK students, so restricting them would damage

university finances and UK export earnings. Living at home restricts students' choice of university and may reduce the quality of education they receive.

Finally, the government could treat high-quality accommodation as a merit good and provide it directly at a fair rent. This guarantees quality and affordability, but it is expensive, slow to build and risks government failure through inefficiency and the lack of a profit incentive.

Overall, the best approach depends on the time period and the price elasticity of supply. In the short run, supply is fixed, so policies that only raise demand mainly raise rents, while rent controls protect current tenants but worsen the shortage.

In the long run, the problem can only be solved by increasing supply, so the main policies should be relaxing planning rules for purpose-built accommodation, supported by targeted subsidies to builders. Temporary limits on rent increases and means-tested grants can protect poorer students while new supply arrives.

The success of this package depends on construction costs and interest rates falling and on the government's budget, but it addresses the cause rather than the symptoms of the shortage.

Question
number

0 5

Private mean = $(18.4 + 16.6 + 14.2 + 13.4 + 12.8) \div 5 = 75.4 \div 5 = 15.08\%$

Public mean = $(59.7 + 58.7 + 56.6 + 52.8 + 50.1) \div 5 = 277.9 \div 5 = 55.58\%$

Difference = $55.58 - 15.08 = 40.5$ percentage points (40.5%)

0 6

Living standards depend largely on real income. Since private and public sector workers face the same inflation rate, faster growth in nominal earnings means faster growth in real earnings and purchasing power.

Figure 2 shows that private sector pay growth was above public sector pay growth for most of the period since 2015, for example around 2% to 4% compared with about 1% to 3% between 2015 and 2019. The only significant period when the public sector was ahead was 2020, when private pay growth fell to about -2.2%. It then rebounded very quickly to a peak of about 10.5% in 2021, compared with a public sector peak of only about 5.5%, a gap of up to about 7.6 percentage points. By September 2022 private pay growth was still about 6.8% against only about 2.9% in the public sector.

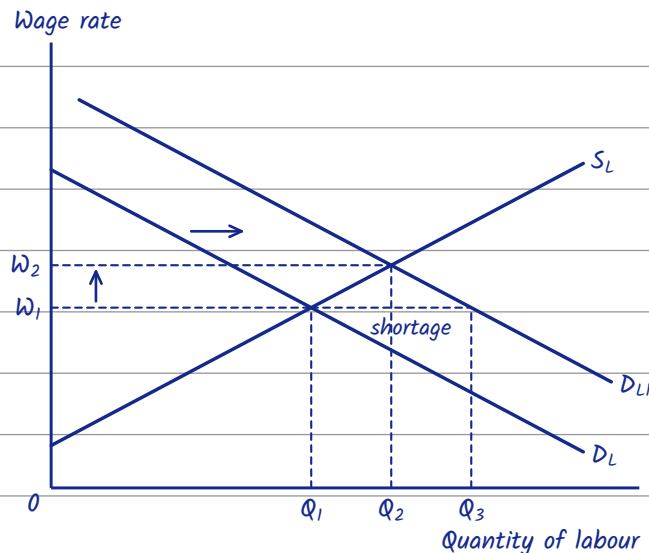
Because private sector pay has grown faster over most of the period, its cumulative increase is larger, so private sector workers' living standards are likely to have risen relative to those of public sector workers.

0 7

A competitive labour market has many employers and many workers, so no individual can influence the wage; workers are homogeneous, have perfect information and are mobile. The wage is set where the demand for labour, derived from its marginal revenue product (MRP), equals the supply of labour. A shortage of labour is excess demand: at the current wage, employers want to hire more workers than are willing to work.

A shortage can arise from an increase in demand for labour, for example because low unemployment and recovering demand for products in construction and hospitality raise MRP, shifting demand right from D_L to D_{L1} in the diagram. It can also arise from a fall in supply, for example fewer migrant workers or more people leaving the labour force, shifting supply left.

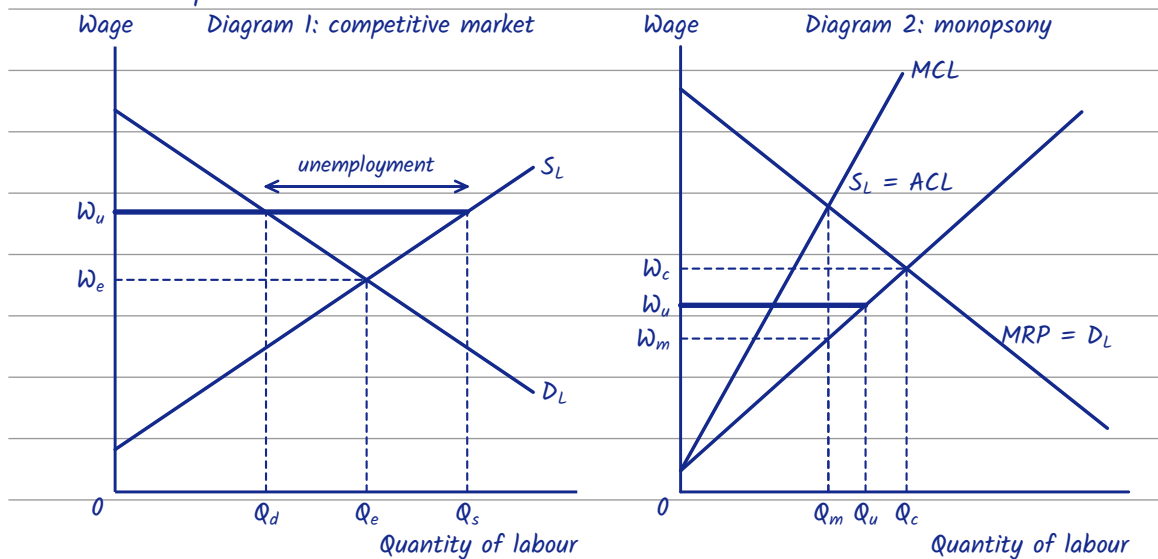
In the diagram, at the original wage W_1 firms demand Q_3 workers but only Q_1 are



supplied, a shortage of Q_1Q_3 . Firms cannot fill vacancies, as 13.3% of businesses reported in November 2022 (Extract E), so they compete for workers by offering higher wages. The rising wage signals where labour is scarce, gives workers an incentive to join the industry or work longer hours (an extension along S_L), and rations labour towards firms with the highest MRP (a contraction along D_{L1}). The wage keeps rising until the shortage is eliminated at the new equilibrium w_2, Q_2 . The extent of the rise depends first on the size of the shortage: a larger shift in demand means a larger rise in the wage. Second, it depends on the wage elasticity of labour supply. Where supply is inelastic, for example skilled construction trades that need years of training, or where workers are occupationally or geographically immobile, the wage must rise a lot to attract workers. Where supply is elastic, as with low-skilled hospitality jobs, more of the adjustment comes through employment and the wage rises less. Third, if the wage elasticity of demand is high, because labour is a large share of costs or can be replaced by machines, firms will cut back hiring rather than pay much more, limiting the wage rise.

Time also matters: in the long run labour supply becomes more elastic as people retrain or migrate, so wage rises may be temporary. In practice the effect may also be limited by firms automating or offering non-wage benefits instead. Extract E shows overall pay growth of 5.7%, below inflation of 10.1%, so although shortages raised nominal wages, real wages still fell.

A trade union is an organisation of workers that bargains collectively with employers to improve pay, working conditions and job security. Labour markets operate well when they allocate labour efficiently, with wages reflecting workers' marginal revenue product and employment at the level a competitive market would reach, and when outcomes are reasonably fair. Whether unions improve this operation depends crucially on the type of labour market they operate in. In a perfectly competitive labour market, wages and employment are set by the demand for and supply of labour, and the outcome is already efficient. As shown in diagram 1, if a union negotiates a wage W_u above the equilibrium W_e , the labour supply curve becomes horizontal at W_u up to the original supply curve. Employers contract employment from Q_e to Q_d while more people want to work (Q_s), so unemployment of Q_dQ_s is created. Those who keep their jobs gain, but other workers are excluded and resources are misallocated, so in this case unions worsen the operation of the market.



However, all real labour markets are imperfect to some extent, and many employers have monopsony power. Extract E notes that employers such as the NHS 'are monopsonistic employers, who have considerable labour market power'. A monopsonist faces an upward-sloping supply curve (ACL), so to hire an extra worker it must raise the wage for all workers, and its marginal cost of labour (MCL) lies above ACL. It profit-maximises where $MCL = MRP$, employing Q_m and paying only W_m , which is below the MRP of the last worker. As diagram 2 shows, both the wage and employment are below the competitive levels W_c and

Q_c .

If a union negotiates a wage $\bar{w}_u$ between $\bar{w}_m$ and $\bar{w}_c$, the employer's MCL becomes horizontal at $\bar{w}_u$ up to the supply curve, so hiring an extra worker no longer raises the wage of the others. The employer now hires up to Q_u , so both the wage and employment rise. Here the union acts as countervailing power, moving the market closer to the competitive outcome and reducing exploitation, so it genuinely improves the operation of the market. This is a strong argument in the public sector, where the state is often the dominant employer of nurses and teachers.

Unions also bring wider benefits. Extract F says unions have campaigned for the minimum wage, holiday and sickness pay, equal opportunity and parental rights. By reducing discrimination and correcting information failures, since an individual worker rarely knows what colleagues earn or their legal rights, unions improve fairness. Through the 'voice' role, they give workers a way to raise problems instead of quitting, which reduces staff turnover and recruitment costs, and research shows they promote training and innovation (Extract F). A single negotiator also cuts the transaction costs of bargaining with many individual workers.

On the other hand, there are significant costs. Strikes cause disruption: 205 000 working days were lost in September 2022, almost as many as in the whole of 2019 (Extract F), and strikes by transport workers, teachers and nurses disrupt the working lives of everybody else, a negative externality. Higher wages may raise firms' costs, reduce competitiveness or be passed on as higher prices, and restrictive practices can slow the adoption of new technology. Unions protect insiders, often older, better-paid workers, at the expense of outsiders such as the unemployed.

The data also suggest union power to protect workers is limited. Membership has fallen from 29.3% of all employees in 2001 to 23.1% in 2021, and only 12.8% in the private sector (Extract D). Yet the heavily unionised public sector, with 50.1% membership, saw pay growth of only 2.2% in September 2022 compared with 6.6% in the private sector (Extract E), and both were below inflation of 10.1%.

So unions did not prevent a fall in public sector real wages, partly because the government faces budget constraints. In contrast, collective bargaining backed by the threat of strikes did win London bus drivers an 18% rise (Extract F), showing that effectiveness depends on bargaining power, which is greater where labour demand is inelastic and the service is essential.

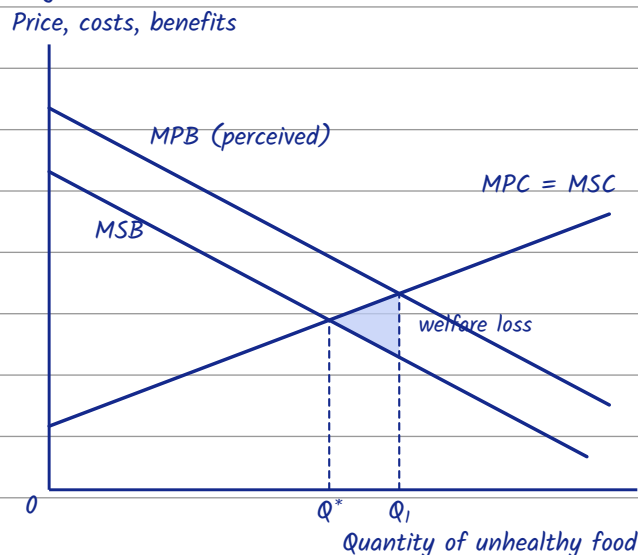
The effect on efficiency also depends on the extent of monopsony power. If the union pushes the wage above W_c , even in a monopsony employment falls below Q_c and the benefits are lost. Public sector monopsony may also mean that weak pay causes shortages: Extract E says the 'huge wedge' in pay is creating severe recruitment and retention problems, so unions pushing for higher pay may actually improve the allocation of labour into the NHS and schools.

In conclusion, the view is largely correct for labour markets where employers have monopsony power, which includes large parts of the UK public sector: here unions can raise both wages and employment, reduce turnover and improve fairness. It is much weaker in competitive labour markets, where union wage rises cause unemployment, and strikes impose wider costs. Overall, unions improve the operation of labour markets when they act as a counterweight to employer power and bargain realistically, but not when they push wages well above the competitive level or use frequent, disruptive strikes. Given falling membership and real pay in the public sector, their actual influence today is more limited than their supporters claim.

Market failure occurs when the price mechanism fails to allocate scarce resources efficiently, so that social welfare is not maximised. Rational decisions need full information about the costs and benefits of a choice. Imperfect information means economic agents lack some of the information they need; asymmetric information is a particular case where one party to a transaction, such as a food manufacturer, knows more than the other, the consumer.

Food producers and retailers know far more about ingredients, sugar, salt and fat content and production methods than consumers. A processed ready meal or breakfast cereal marketed as 'healthy' or 'natural' may contain high levels of sugar, and consumers cannot easily verify this. Firms have an incentive to exploit this asymmetry, since unhealthy ingredients are often cheaper and make food more appealing. As a result, consumers overestimate the benefits and underestimate the long-term private costs of unhealthy food, such as obesity, diabetes and heart disease.

Unhealthy food is therefore a demerit good: it is over-consumed when individuals act in their own interest because they do not fully appreciate its harm. In the diagram, consumers base decisions on their perceived marginal private benefit (MPB), which is higher than the true benefit, MSB, that they would perceive with full information. Equating MPB with $MPC = MSC$, they consume Q_1 , whereas the socially optimal output is Q^* where $MSB = MSC$. Between Q^* and Q_1 , the cost of each unit exceeds its true benefit, so there is a welfare loss shown by the shaded triangle and resources are misallocated.



The opposite occurs with healthy foods such as fruit and vegetables, which are merit goods. Consumers underestimate their long-term benefits, so they are under-consumed. These problems are worsened because many consumers have a poor understanding of nutrition in general: even with full product information, people may not know how many calories they need or what 'traffic light' labels mean, so they still make poor decisions. There is also bounded rationality: shoppers have limited time and cannot process complex labels in a supermarket. Information failure is especially serious for children, who regularly spend on snacks and sweets but are the least informed consumers and are heavily targeted by advertising. Advertising itself can be persuasive rather than informative, creating demand for products whose true costs are hidden. Unhealthy diets also create negative consumption externalities: obesity-related illness costs the NHS billions, paid for by taxpayers, and reduces labour productivity. Because consumers ignore these external costs, MSB lies further below MPB and the over-consumption is greater.

Regulation of food labelling can reduce asymmetric information, but labels may not form an important part of the buying decision: habit, price and convenience often dominate. Overall, imperfect and asymmetric information lead to over-consumption of unhealthy food and under-consumption of healthy food, so the market for food fails to allocate resources to maximise welfare.

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Behavioural economics recognises that consumers are not always rational utility maximisers: they have bounded rationality, bounded self-control and biases, for example placing too much weight on present satisfaction and too little on future health. A nudge is a change to choice architecture, the way choices are presented, that alters behaviour in a predictable way without banning options or significantly changing financial incentives. Other techniques include default choices, restricted choice, mandated choice and framing.

Reducing unhealthy food consumption matters because such foods are demerit goods. Consumers under-estimate the private costs, and there are negative externalities, such as NHS treatment costs for obesity-related illness paid for by

taxpayers and lost productivity. With 64% of the UK population overweight, the welfare loss is large.

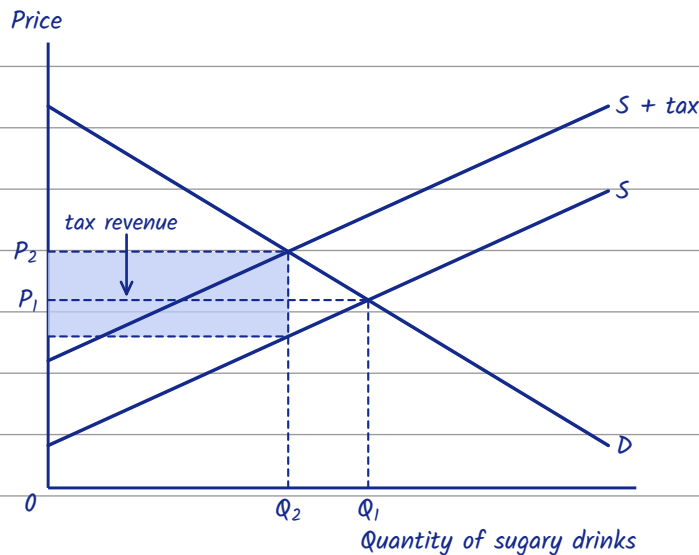
Nudges have several advantages. Supermarkets can place fruit at the checkout instead of sweets, and canteens can put healthy options at eye level and serve smaller default portion sizes. Framing, such as traffic light labels showing high sugar in red, makes the costs of a choice salient and counters information failure. Default choice is powerful because of status quo bias: if a school meal or meal deal comes with water or fruit unless the customer actively opts out, most people stick with the default. These measures preserve freedom of choice, are cheap to implement and do not raise prices, so they avoid the regressive burden of a tax on poorer households, who spend a larger share of income on food. Because they work with consumers' biases rather than against them, they can be effective where education alone fails.

However, nudges have limitations. Their effects are often small and may fade as people become used to them. Firms have a strong profit motive to nudge consumers the other way through advertising, special offers and packaging, so government nudges compete against powerful marketing. Habits, social and cultural norms and the relative cheapness of unhealthy food may outweigh a change in presentation. Nudges also raise concerns about paternalism and manipulation, and it is difficult for the government to know which nudge works, a source of government failure.

The main alternative is to use traditional policies. An indirect tax, such as the Soft Drinks Industry Levy, internalises the external cost. In the diagram the tax shifts supply from S to $S+tax$, raising price from P_1 to P_2 and reducing quantity from Q_1 to Q_2 , while raising tax revenue (shaded) that could fund healthy school meals. The levy was effective partly because manufacturers reformulated their drinks to avoid it, cutting sugar content. However, demand for many unhealthy foods is price inelastic, so a tax may raise revenue more than it reduces consumption, it is regressive, and it is hard to set at the right level because the size of the externality is difficult to value.

Subsidies for healthy food and free healthy school meals increase consumption of

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merit goods and help poorer families, but they have an opportunity cost.

Regulation, such as limits on salt or sugar in products, bans on advertising unhealthy food to children and restrictions on 'buy one get one free' offers, can be very effective because it changes what is supplied, but it may involve high enforcement costs and lobbying by firms. Education and information campaigns address the root cause, imperfect information, but take a long time and many people already know that unhealthy food is bad for them yet still eat it, which is exactly the problem of bounded self-control that nudges target.

In reality the different approaches are complements rather than substitutes.

Restricting advertising aimed at children is itself a form of restricted choice, and labelling is both regulation and framing. The best policy also depends on the cause: where the problem is lack of self-control and poor default options, nudges work well; where it is price, since unhealthy calories are cheap, taxes and subsidies are needed; where firms' products are the problem, regulation and reformulation are most effective.

In conclusion, nudges are a cheap and non-coercive way to reduce consumption of unhealthy food and are likely to be effective at the margin, especially in schools and workplaces. However, the evidence suggests their impact alone is too small to deal with an obesity rate of 64%. Unhealthy food can best be reduced by combining nudges with taxes that encourage reformulation, regulation of advertising to children and subsidies for healthy options. Behavioural techniques are an important part of the policy mix, but not the best single solution.

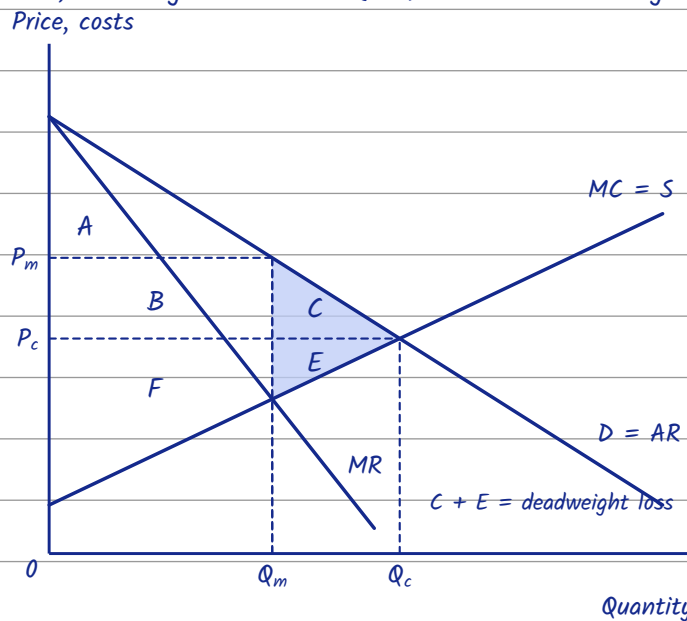
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Consumer surplus is the difference between the price consumers are willing to pay and the price they actually pay, shown by the area below the demand curve and above the price. Producer surplus is the difference between the price producers receive and the minimum they would accept, the area above the supply (marginal cost) curve and below the price.

In a competitive market there are many firms selling similar products, with free entry and exit and good information, so each firm is a price taker. Industry output is where demand equals supply, and since supply reflects marginal cost, price equals marginal cost ($P = MC$), which is allocatively efficient. An industry dominated by a few large firms, an oligopoly or in the extreme a monopoly, has high barriers to entry and the firms are price makers facing a downward-sloping demand curve, so marginal revenue (MR) lies below average revenue.



The diagram compares the two structures, assuming costs are unchanged so that the industry MC curve is the same. Under competition, output is Q_c and price P_c . Consumer surplus is $A + B + C$ and producer surplus is $E + F$. If the industry becomes dominated by a few firms that act together like a monopolist, they profit-maximise where $MR = MC$, restricting output to Q_m and raising price to P_m . Consumer surplus falls for two reasons. First, consumers who still buy pay a higher price, so area B is transferred from consumers to producers. Second, output falls from Q_c to Q_m , so consumers who are no longer willing to buy lose area C. Consumer surplus shrinks from $A + B + C$ to just A.

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Producer surplus is likely to rise, from $E + F$ to $B + F$. The firms gain the transfer B but lose area E on the units no longer produced. Because $MR = MC$ is profit-maximising, B must be larger than E ; otherwise the firms would have no incentive to restrict output. Areas C and E are lost by both groups and gained by no one, so the move creates a deadweight welfare loss of $C + E$ and total surplus falls. The market is now allocatively inefficient because $P > MC$.

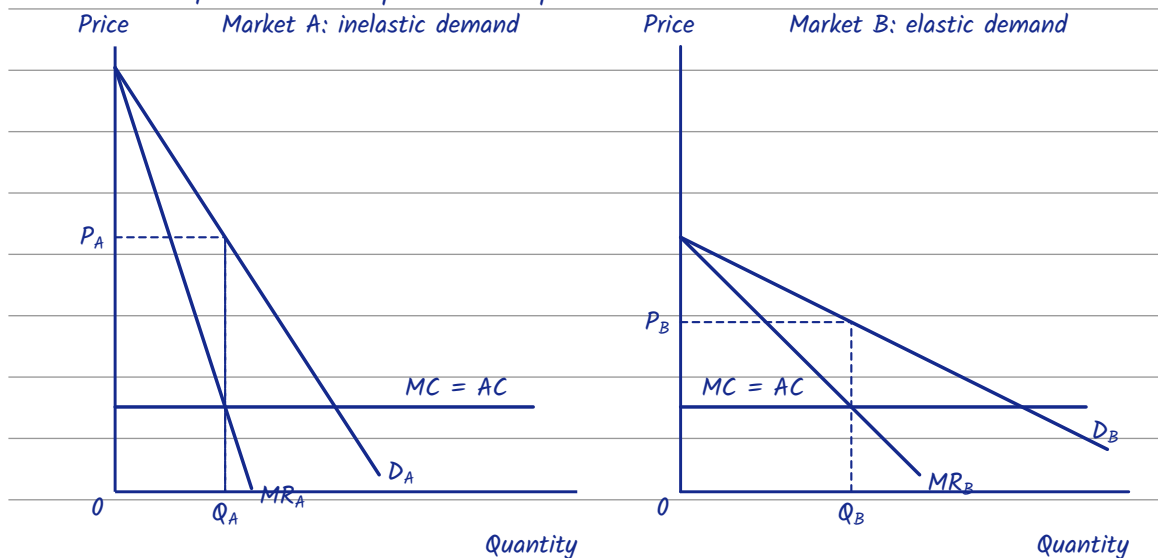
Examples include broadband and mobile phone markets, where Citizens Advice found that existing customers are charged more than new customers, transferring surplus from loyal consumers to firms, and energy supply, where the collapse of many small suppliers left larger firms with more market power.

The size of the effect depends on several factors. If the large firms compete hard on price, as in a Bertrand-style price war, price may stay close to MC and little consumer surplus is lost. The more price inelastic demand is, the more firms can raise price and the larger the transfer from consumers. Large firms may also gain economies of scale, lowering MC so that price could even fall, and supernormal profits may fund innovation that increases consumer surplus in the long run. However, if firms collude, or become X-inefficient through lack of competition, costs rise and consumer surplus falls further. Overall, the likely impact is lower consumer surplus, higher producer surplus and a deadweight loss.

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Price discrimination occurs when a firm charges different prices to different consumers for the same good or service, for reasons not associated with differences in costs. Three conditions are needed: the firm must have some price-setting (monopoly) power; it must be able to separate the market into groups with different price elasticities of demand; and it must be able to prevent resale (arbitrage) between the groups. First-degree price discrimination charges each consumer the maximum they are willing to pay; second-degree charges different prices by quantity bought, such as bulk discounts; third-degree charges different prices to different groups, such as peak and off-peak rail fares or new and existing customers of broadband providers.

Price discrimination can damage consumers. In third-degree discrimination, the firm sets $MR = MC$ in each sub-market. As the diagram shows, in market A, where demand is price inelastic, the firm charges a high price P_A ; in market B, where demand is elastic, it charges a lower price P_B . Consumers in market A, such as commuters who must travel at peak times or loyal customers who do not switch, pay much more than they would at a single price, and consumer surplus is converted into producer surplus. Under first-degree discrimination the whole of consumer surplus becomes producer surplus.



Price discrimination can also be seen as unfair, because the price paid depends on circumstances such as lack of time or information rather than cost. Pricing structures can be opaque and unpredictable, as in airline pricing, making it hard to compare offers. The CMA criticised the 'loyalty penalty' where existing customers pay more, which particularly hurts elderly and vulnerable consumers who are less likely to switch. Firms also incur administration costs in segmenting the market that may be passed on, and the internet makes discrimination easier, since firms collect data on browsing and purchases and can use algorithms to estimate individual willingness to pay, moving closer to first-degree discrimination. However, price discrimination can benefit consumers. Some consumers pay a lower price than under a single monopoly price: students, pensioners and those who compare suppliers, such as new broadband customers, get cheaper deals. Output is often higher than under single-price monopoly, so more consumers gain access to the product; some consumers in the elastic market would not have bought at all.

Under perfect price discrimination output rises to where $P = MC$, the allocatively efficient level, even though the surplus goes to the firm.

Peak pricing can improve the quality of services by smoothing demand, reducing congestion on trains at rush hour and making better use of capacity. Higher profits may be invested in better products, new technology and infrastructure, a dynamic efficiency gain. Firms may also use profits from one market to cross-subsidise another: for example, high peak fares can keep loss-making rural or off-peak services running, which benefits consumers who rely on them.

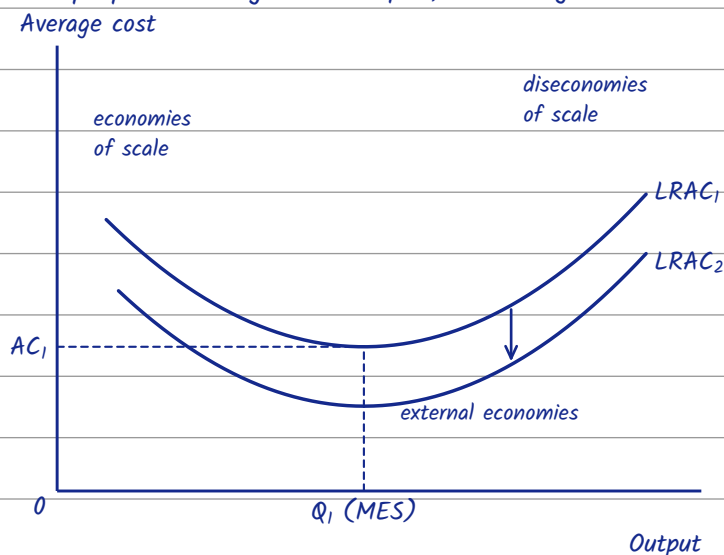
The overall effect depends on the price elasticity of demand in each segment, on whether the relevant alternative is a single-price monopoly or a competitive market, and on how profits are used. Compared with a competitive market, price discrimination is clearly worse for consumers as a whole. Compared with a single-price monopolist, it may increase output and help low-income groups. It also depends on who is affected: poorer, less informed or less mobile consumers are most likely to pay the high price, which raises equity concerns, while wealthier, well-informed consumers may benefit.

Regulation is possible: Ofcom and Ofgem have required firms to notify customers when contracts end and limited loyalty penalties. However, banning all price discrimination could remove discounts for students and pensioners and raise prices for elastic groups, so regulators must target harmful forms rather than the practice itself.

In conclusion, price discrimination is damaging for many consumers, particularly those with inelastic demand, little information or loyalty to their supplier, because it transfers surplus to firms. However, it is not damaging for all consumers: it can extend output, give lower prices to price-sensitive groups and fund services that would otherwise not exist. Whether it is damaging overall depends on market power and the alternative pricing structure, so it should be judged case by case, with regulation focused on exploitative practices such as the loyalty penalty.

Total cost is the full cost of producing a given output, average cost (AC) is total cost divided by output, and marginal cost is the change in total cost from producing one more unit. Economies of scale are the reductions in long-run average cost (LRAC) that occur as a firm increases the scale of production, using more of all factors of production. Diseconomies of scale are increases in long-run average cost as the scale of production rises beyond a certain point.

Internal economies of scale arise from the growth of the firm itself. Technical economies come from using large, specialised capital: a container ship carrying 20 000 containers costs far less per container than a small ship, because doubling dimensions more than doubles capacity (the law of increased dimensions). Large firms can use specialised labour and machinery and production lines, as in car manufacturing. Purchasing economies occur when firms buy inputs in bulk at a discount, as supermarkets such as Tesco do. Financial economies allow large firms to borrow more cheaply because they are seen as less risky. Marketing economies spread the fixed cost of an advertising campaign over more units, and risk-bearing economies come from diversifying products and markets. In each case total costs rise less than proportionately with output, so average cost falls.



External economies of scale arise from the growth of the industry in an area, rather than of the firm. Firms benefit from a pool of skilled labour, specialist suppliers, shared infrastructure and knowledge spillovers, as with technology firms in Silicon Valley or financial firms in the City of London. These lower average costs at every level of output, so as shown in the diagram the whole LRAC curve

shifts down from $LRAC_1$ to $LRAC_2$.

If a firm grows too large, diseconomies of scale set in. Communication becomes slower and less effective across many layers of management, coordination and control become difficult, and workers may feel alienated, reducing motivation and productivity. Decisions take longer, and the firm may face higher costs from bureaucracy. External diseconomies may also arise, such as congestion and rising rents and wages when too many firms locate in one area. These cause average cost to rise.

These effects explain the shape of the LRAC curve shown in the diagram. As output rises from zero, economies of scale make LRAC fall. The minimum efficient scale (MES) is the lowest output at which LRAC is minimised, Q_1 in the diagram.

Over a range of output there may be constant returns to scale where LRAC is flat. Beyond that, diseconomies dominate and LRAC rises, giving the U shape.

The importance of economies of scale varies by industry. Where fixed costs are very high and the MES is large relative to market demand, as in water or rail infrastructure, only one or a few firms can produce efficiently, leading to natural monopoly. Where the MES is small, as in hairdressing, many small firms can survive. In practice, firms may not experience diseconomies at the output levels they choose, and good management, such as decentralised decision-making, can delay their onset, so LRAC may be L-shaped rather than U-shaped.

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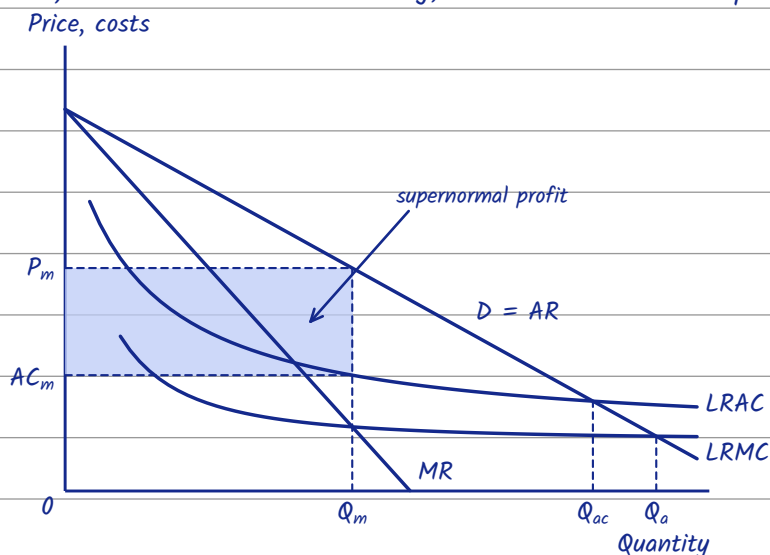
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A privatised industry is one that has been transferred from public (state) ownership to private ownership, as with British Gas in 1986 and the electricity industry from 1990. Public ownership, or nationalisation, means the state owns the industry's assets and runs it, in principle in the public interest rather than for profit. The 2021 energy crisis, when 49 supply companies collapsed after the surge in wholesale prices, has renewed calls for renationalisation.

The case for privatisation is that private firms have a profit motive, giving an incentive to cut costs and avoid X-inefficiency; nationalised industries were often criticised for overmanning and slow decision-making. Privatisation can also open

markets to competition, as with the deregulated energy supply market, giving consumers choice and putting downward pressure on prices. It raised large revenues for the government, reduced the burden on taxpayers of covering losses and subsidies, widened share ownership, and reduced political interference, for example ministers holding prices down before elections at the cost of investment. Since privatisation, regulators such as Ofgem have used price caps to pass efficiency gains on to consumers, and the share of renewable energy has risen sharply, financed by private investment.

However, there are strong arguments for public ownership. Parts of energy, especially the national grid and local distribution networks, are natural monopolies: fixed costs are so large that LRAC falls over the whole range of market demand, so one firm can supply at the lowest cost. As shown in the diagram, a private profit-maximising monopolist produces where $MR = MC$ at Q_m and charges P_m , earning supernormal profit (shaded), with output well below the allocatively efficient level Q_a where $P = MC$. A publicly owned firm could set price nearer to MC or AC (Q_{ac}), increasing output and consumer surplus. At Q_a price is below average cost, so it would need a subsidy, which the state can provide.



Energy is also strategically important: it is an essential service used by everyone, and the 2021 crisis showed that, when private suppliers failed, the state and other customers bore the cost through the supplier of last resort scheme. Private firms may under-invest in long-term infrastructure such as nuclear power or storage, because their planning horizon is shorter than the state's. Public

ownership may make it easier to consider external costs, such as carbon emissions, and to coordinate a fragmented industry. Regulation of private monopolies is costly and imperfect: regulators suffer from asymmetric information and risk regulatory capture. In addition, profits paid as dividends to shareholders could instead be retained by the state to keep prices down.

Yet public ownership has serious drawbacks. Buying back the industries would cost tens of billions of pounds, adding to government debt at a time of high interest rates, or else shareholders would have to be compensated below market value.

Without a profit motive or competition, nationalised firms may become X-inefficient and less innovative, and investment would compete with other public spending, such as the NHS, so it might actually fall. Government failure is likely: politicians may hold prices down for short-term electoral reasons, causing losses and under-investment, as happened in the 1970s. Ownership also does not change the main cause of the 2021 crisis, a global rise in wholesale gas prices: a nationalised supplier would face the same costs and the losses would fall on taxpayers instead.

The answer differs between parts of the industry. The grid and distribution networks are natural monopolies where competition is impossible, so public ownership, or tightly regulated not-for-profit ownership, is more justified. Energy generation and retail supply can be competitive, so private ownership with good regulation may be better: the collapse of 49 suppliers partly reflected weak regulation of firms' finances by Ofgem rather than private ownership itself.

Stronger capital requirements and price caps may achieve most of the benefits of nationalisation at much lower cost. It also depends on whether the state can run industries efficiently: experience with rail, where franchises have returned to public operation when they expired, shows renationalisation can be done cheaply when contracts end, but not for industries that are fully owned by shareholders.

In conclusion, there is a strong case for public ownership of natural monopoly networks and for greater state involvement in long-term strategic investment in energy, because of market failures such as monopoly power, under-provision of infrastructure and external costs. However, renationalising the whole electricity and

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gas industry is unlikely to be worth the very high cost and the risk of government failure. Better regulation of privatised firms, combined with public ownership only where competition cannot work, is likely to deliver the best outcome for consumers and taxpayers.

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