

Surname <i>StemUp Model Solution</i>	Centre Number	Candidate Number
First name(s)		2



GCE AS

B520U10-1



MONDAY, 5 OCTOBER 2020 – MORNING

ECONOMICS – AS component 1
Introduction to Economic Principles

1 hour

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	4	
2.	4	
3.	14	
4.	10	
5.	10	
6.	4	
7.	7	
8.	7	
Total	60	

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ADDITIONAL MATERIALS

A calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space use the continuation page(s) at the back of the booklet, taking care to number the question(s) correctly.

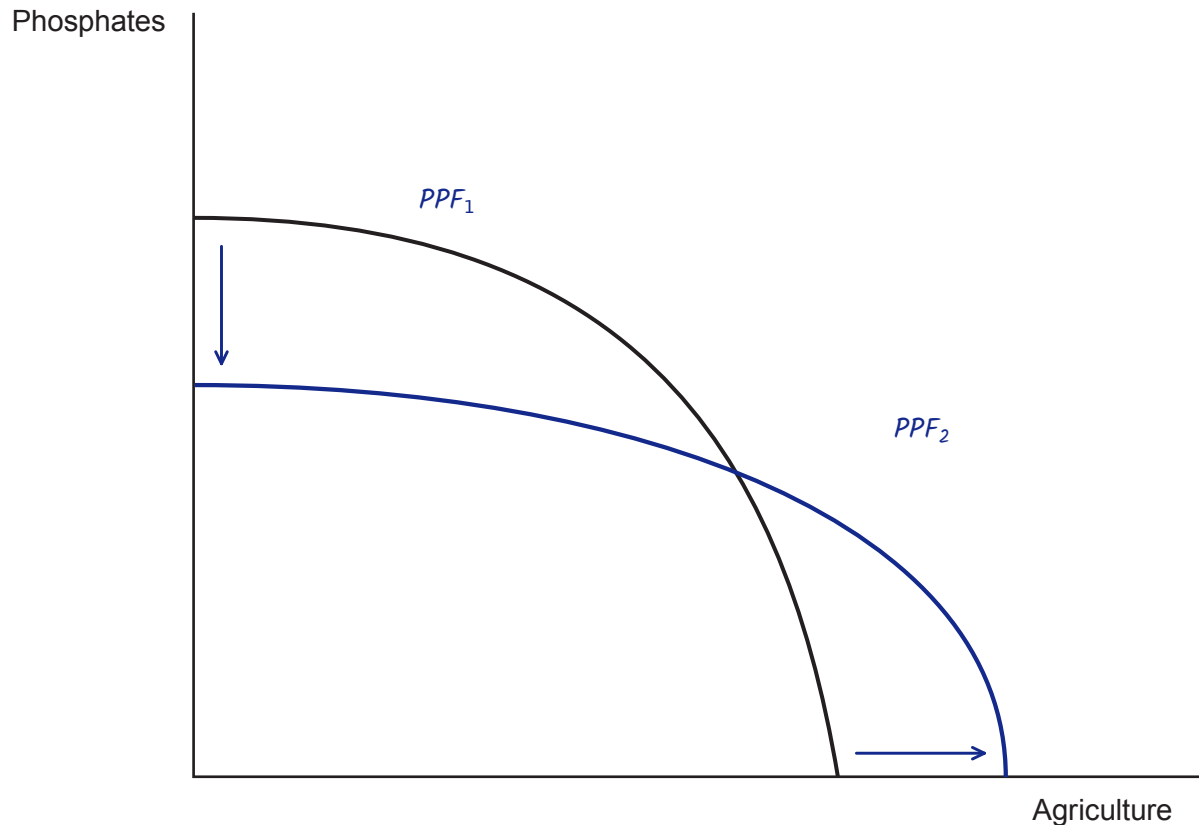
INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

Answer **all** the questions in the spaces provided.

1. The production possibility frontier (PPF) diagram below represents Nauru's economy in the 1970s. Nauru is an island nation in the South Pacific, whose major areas of economic activity were phosphate mining and agriculture.

Since then Nauru's phosphate mines have become steadily less productive as the phosphates ran out, but at the same time the government invested in improving agricultural productivity.



Adapt the PPF diagram to show how the factors in the data affected Nauru's economy and outline your reasons for the changes you make. [4]

Phosphates running out lowers the maximum phosphate output Nauru can produce, so the PPF shifts inward on the phosphate axis.

Investment in agricultural productivity means more agricultural output from the same resources, so the PPF shifts outward on the agriculture axis ($PPF_1 \rightarrow PPF_2$).

2. EU's wood-burning targets are bad for the planet, say scientists

According to a recent study, government policies to promote the burning of wood as an environmentally friendly 'renewable fuel' will increase greenhouse gas emissions and risk damaging global forests.

Using the data, outline what is meant by government failure.

[4]

Government failure occurs when government intervention to correct a market failure leads to a less efficient allocation of resources and a net welfare loss, i.e. the intervention makes things worse.

Here the EU intended to correct the negative externality of fossil fuels (greenhouse gas emissions) by promoting wood-burning as a 'renewable fuel'. But the study says this will actually increase greenhouse gas emissions and risk damaging global forests (deforestation, loss of carbon sinks). So the policy worsens the very externality it targets and creates new environmental costs, a net welfare loss: government failure, probably caused by imperfect information about the true environmental effects of wood-burning.

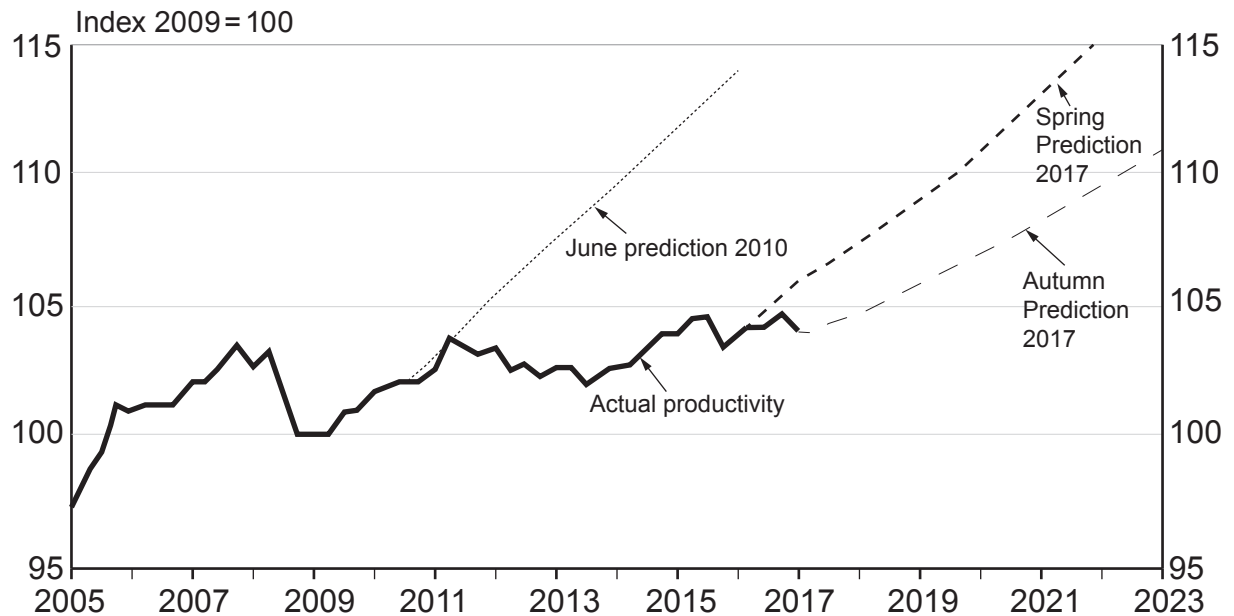
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3. Study the chart below and answer the questions that follow.

Productivity growth revised down

Output per hour



Source: Office for National Statistics, Office for Budget Responsibility

- (a) Calculate the percentage rise in actual productivity between 2005 and 2017. [2]

Index in 2005 $\approx$ 97, index in 2017 $\approx$ 104.

$$\% \text{ rise} = (104 - 97) \div 97 \times 100 = 7.2\% (7.22\%)$$

- (b) Identify **two** possible causes of the low productivity growth in the UK from 2011 to 2017. [2]

1. Low levels of investment by firms in new capital, due to uncertainty after the financial crisis and then Brexit.

2. Skills shortages in the workforce (and the UK being a service-based economy, where productivity is harder to raise).

Over the period shown in the chart, UK Governments have used a variety of supply-side policies in an attempt to improve UK productivity.

- (c) To what extent can supply-side policies bring about productivity growth in the UK economy? Refer to the data in your answer. [10]

Supply-side policies are government policies that aim to increase the quantity, quality and efficiency of the factors of production, raising productivity (output per worker or per hour) and shifting LRAS to the right. Examples include spending on education and training, infrastructure, tax incentives for investment, and labour market deregulation.

In theory they work. More education and training spending gives firms better-skilled workers, so less training is needed and each worker produces more per hour. Lower corporation tax and investment allowances raise post-tax returns, so firms buy more and newer capital, and each worker has more and better machinery, raising output per hour.

However, the data suggests UK supply-side policies have had limited success. Actual productivity (index 2009 = 100) rose quickly from about 97 in 2005 to 103.5 in 2007 and from 100 in 2009 to 104 in 2011, but then flat-lined at about 102 to 105 from 2011 to 2017, despite a variety of policies. Governments have consistently missed their forecasts: the June 2010 prediction expected the index to reach about 114 by 2016, about 10 points above the actual 104, and even the Spring 2017 forecast of about 115 by 2022 had to be revised down in the Autumn 2017 budget to about 108.

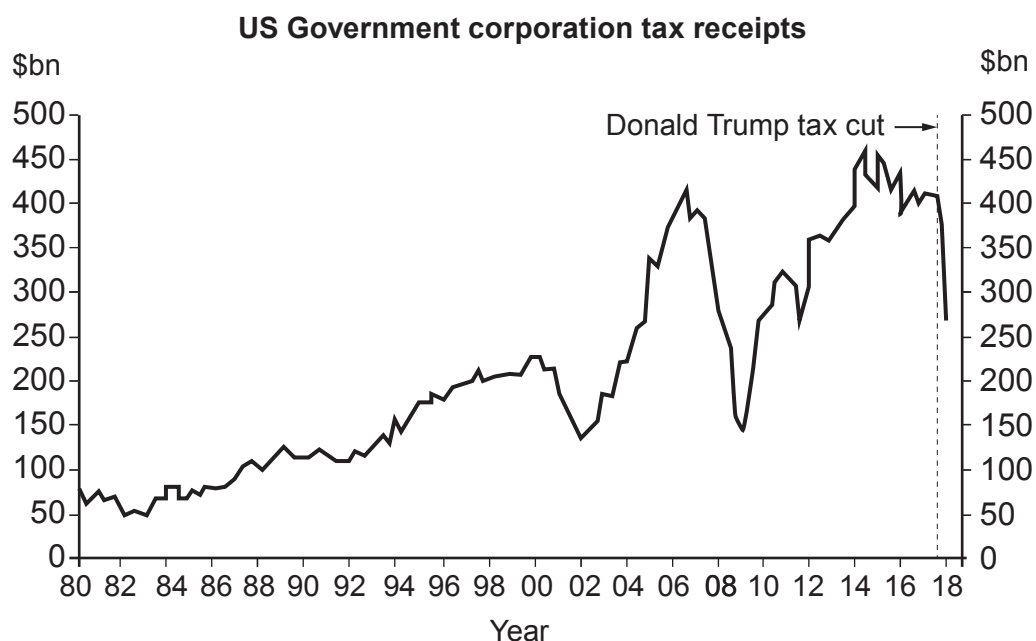
Supply-side policies have long time lags: education and infrastructure take years to raise productivity. They are less effective in times of low growth, recession and uncertainty (the financial crisis, then Brexit), when firms will not invest whatever the incentives. There is a risk of government failure if policies are badly designed: tax cuts may simply increase profits or dividends rather than investment, and deregulation may create low-paid, low-productivity jobs. Finally, real sustained productivity growth

4. Art Laffer says Donald Trump's tax cuts don't go far enough

Art Laffer (an American Economist) says the \$1.5 trillion in tax cuts – temporarily reducing US income tax rates and permanently cutting US corporation tax rates – should be even larger.

Other economists disagree because US government tax receipts were 7% less in June 2018 than in June 2017, including a 33% drop in corporation tax revenue, leaving a \$607bn budget/fiscal deficit for the first 9 months of 2018.

Laffer argued that the reduced government tax receipts were to be expected initially, but that increased economic growth would offset those losses in the long run. However, others argued that with the US economy close to full employment, the scope for significant increases in GDP is limited.



With reference to the data, discuss the extent to which “even larger” tax cuts would be likely to significantly reduce the US government’s budget/fiscal deficit. [10]

A budget (fiscal) deficit is the amount by which government spending exceeds tax revenue in a given time period, usually a year. The US deficit was \$607bn in just the first 9 months of 2018.

Laffer's argument is based on the Laffer curve: above the revenue-maximising tax rate, cutting tax rates raises tax revenue. Lower income tax increases the incentive to work longer hours and enter the labour force, and lower corporation tax increases the post-tax return on investment and the incentive for corporations to relocate to the US and declare profits there. These raise output and GDP, so the tax base grows by more than the rate falls and receipts rise. Higher growth also cuts spending on welfare, further reducing the

deficit. The chart shows that growth clearly matters: corporation tax receipts fell from about \$410bn in 2007 to about \$140bn in 2009 in the financial crisis, then recovered strongly to about \$450bn by 2015 as the economy grew, with no change in rates.

However, the data suggests this is unlikely. After the cut, corporation tax receipts fell from about \$400bn to around \$275bn, a 33% drop, and total tax receipts fell 7% (June 2018 v June 2017), a lot of ground to recover. A 'larger' cut would initially lose even more revenue and widen the deficit further. Growth is also limited because the US economy is close to full employment: with little spare capacity, higher AD mainly causes inflation rather than significant increases in real GDP, so the tax base cannot expand enough to offset the lower rates. The income tax cuts are only temporary, so they are unlikely to change long-term work decisions, and location decisions depend on many factors besides corporation tax (skills, markets, infrastructure), so the cut may simply let corporations pay less tax or raise dividends and buy back shares.

Much depends on where the US is on the Laffer curve. If rates were above the revenue-maximising rate, cuts could raise revenue, but the huge existing deficit and the

5. The table below gives information on the estimated price elasticities of demand (PED) for conventional cigarettes (tobacco) and e-cigarettes (vaping). It also shows the cross price elasticity of demand between e-cigarettes and conventional cigarettes. The data is for 11–17 year olds in the US.

PED for conventional cigarettes (tobacco)	−0.4
PED for e-cigarettes (vaping)	−1.9
Cross price elasticity between e-cigarettes and tobacco	+2.2

The health problems associated with smoking tobacco are well known, but scientists are uncertain as to the health risks of e-cigarettes. Most research suggests that they are less harmful than conventional cigarettes, but the long-term health risks are not yet known.

Suppose that a US State Government is considering whether to introduce a tax which would raise the price of cigarettes by 10% **or alternatively** a subsidy which would reduce the price of e-cigarettes by 10%.

Using calculations to support your answer, discuss which of the two policies suggested would be most likely to correct the market failures associated with the smoking of conventional cigarettes. [10]

Smoking conventional cigarettes causes market failure: negative externalities (passive smoking, NHS-style healthcare costs, lost output) mean $MSC > MPC$, and information failure, as smokers (especially 11 to 17 year olds) underestimate the health risks of an addictive demerit good. So cigarettes are over-consumed relative to the socially optimal level, causing a welfare loss.

Tax: a 10% rise in the price of cigarettes (if fully passed on) changes Q_d of cigarettes by $-0.4 \times 10 = -4\%$, and with a cross elasticity of +2.2 (substitutes) raises Q_d of e-cigarettes by $2.2 \times 10 = +22\%$.

Subsidy: a 10% fall in the price of e-cigarettes raises their Q_d by $-1.9 \times -10 = +19\%$, and cuts Q_d of cigarettes by $2.2 \times 10 = 22\%$.

A tax internalises the externality: it shifts supply left, raising price towards MSC so consumption falls nearer the social optimum. The subsidy instead makes the substitute cheaper, encouraging smokers to switch to the less harmful product.

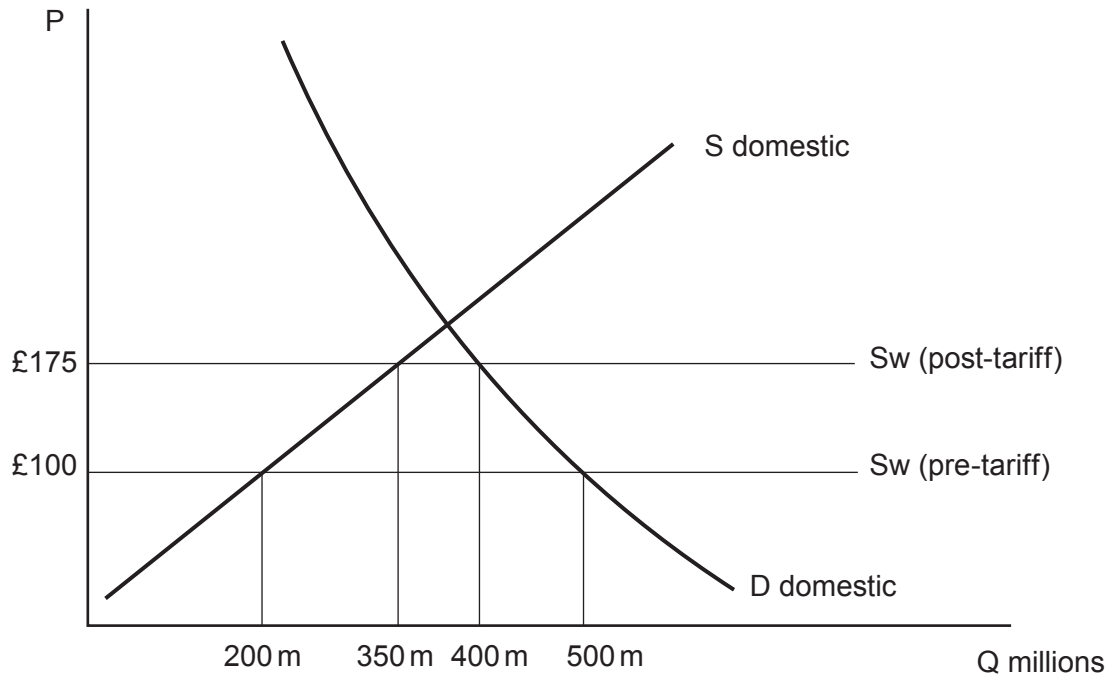
On these figures the subsidy is far more effective: it cuts cigarette use by 22%, over five times the 4% from the tax, because cigarette demand is very price inelastic (−0.4, addictive) while e-cigarettes are price elastic (−1.9) and close substitutes. It also raises

vaping by less (19% v 22%).

However, the figures are only for 11 to 17 year olds in the US, so the effect on adults is unknown; it is unclear how much of the tax or subsidy is passed on to consumers; and elasticity estimates are often unreliable and may vary with the size of price change.

The long-term health risks of e-cigarettes are unknown, so encouraging 11 to 17 year olds to vape could create new future harm and addiction (government failure). The tax raises revenue that could fund anti-smoking campaigns, while the subsidy has an opportunity cost. As it is a state government, consumers may buy cigarettes across the

6. The diagram below shows the impact on a domestic market of the introduction of tariffs on the import of a product.



Calculate

- (i) The tax revenue generated for the government.

[2]

$$\text{Imports after tariff} = 400\text{m} - 350\text{m} = 50\text{m units}$$

$$\text{Tariff} = £175 - £100 = £75 \text{ per unit}$$

$$\text{Tax revenue} = 50\text{m} \times £75 = £3750\text{m} = £3.75\text{bn}$$

- (ii) The increase in domestic producer surplus.

[2]

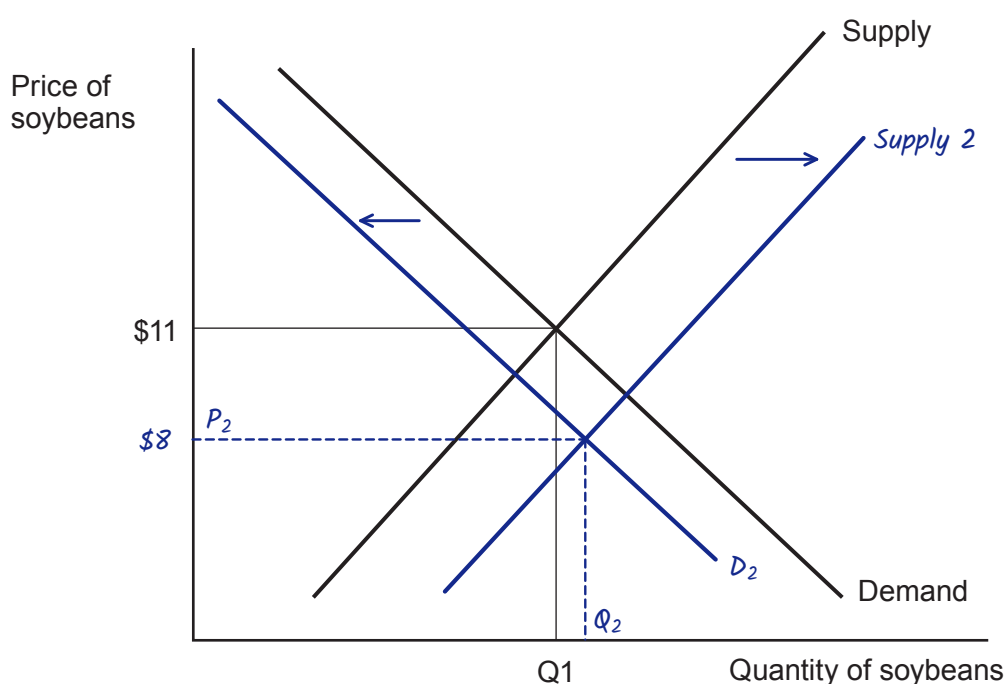
Domestic output rises from 200m to 350m units.

$$\begin{aligned} \text{Increase in producer surplus} &= \text{trapezium} = £75 \times (200\text{m} + 350\text{m}) \div 2 = £75 \times \\ &275\text{m} = £20\,625\text{m} = £20.625\text{bn} \end{aligned}$$

7. As part of the US-China trade war, China has retaliated against US protectionism by imposing a tariff on imported US soybeans. Since China announced the tariff, soybean prices inside the US have dropped from around \$11 per unit to around \$8 per unit. More than half of US soybeans go to China, the world's largest consumer of the beans.

In addition, soybean production was also forecast to reach a record high, 6% above the previous year.

Adapting the supply and demand diagram below and with reference to the data, explain why soybean prices have gone down inside the US. [7]



Demand: more than half of US soybeans go to China, the world's largest consumer.

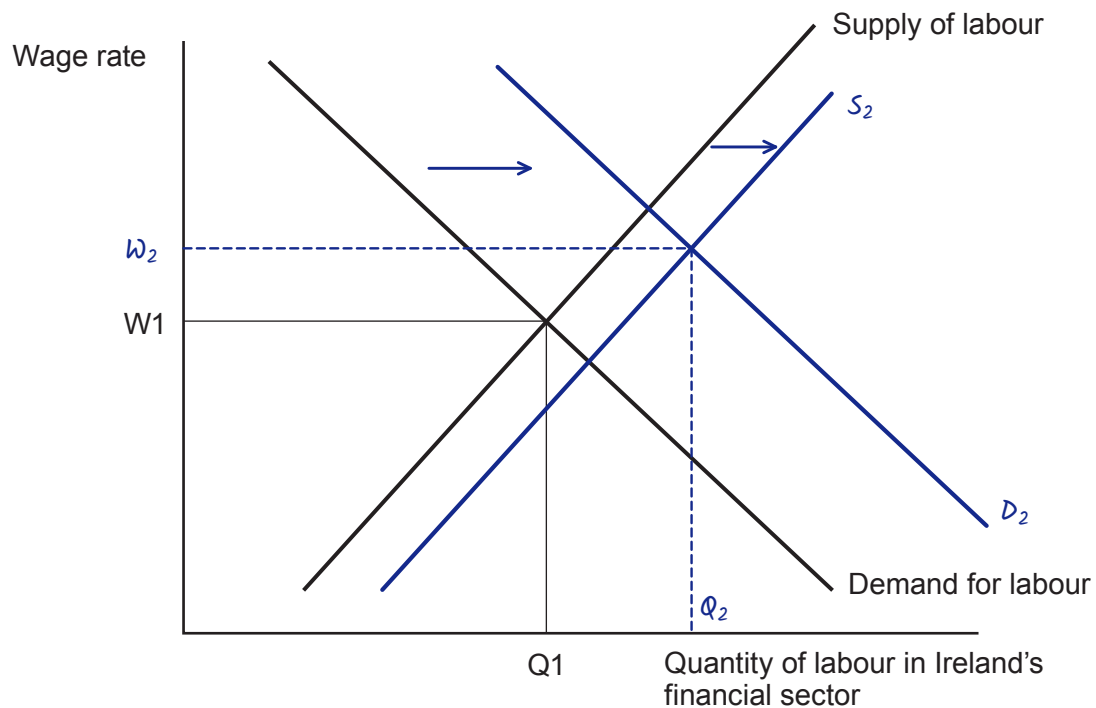
China's tariff raises the price of US soybeans there, so Chinese buyers switch to other suppliers and demand for US soybeans shifts left (Demand $\rightarrow$ D_2).

Supply: record production, 6% above the previous year, shifts supply right (Supply $\rightarrow$ Supply 2).

At the original price of \$11 there is now excess supply, so farmers cut prices until demand equals supply again at a new lower equilibrium of about \$8 (P_2). As the supply increase is larger, quantity rises from Q_1 to Q_2 .

8. Ireland has been a popular destination for financial firms leaving London, causing wages for some staff in this sector to rise by 15%. This has occurred even though there has been an inflow of workers from as far away as Australia and the United States, many of whom were returning having left Ireland after the 2008 financial crisis.

Adapting the diagram below, explain the impact of these changes on wages in the financial sector in Ireland. [7]



Demand for labour is derived demand: financial firms leaving London and relocating to Ireland need staff, so demand for labour shifts right ($D \rightarrow D_2$).

Supply also rises: an inflow of workers from Australia and the US, many returning after leaving in 2008, shifts supply right ($S \rightarrow S_2$).

Because demand has risen by more than supply, at W_1 there is excess demand for labour, so firms compete for scarce staff, bidding wages up to W_2 (a 15% rise for some staff), with employment rising from Q_1 to Q_2 .

END OF PAPER

For continuation only.*3. (c) continued*

may come more from technological change, such as robots and AI, than from government policy.

Overall, supply-side policies can raise productivity, but only to a limited extent and in the long run. The flat-lining actual line and repeated downward revisions show the effect depends on the specific policy (education more than tax cuts), business confidence and time scale.

4. continued

fall in receipts after the cut suggest US rates are already below it, so further cuts would reduce revenue. It also depends on the time scale, as investment and relocation are long-term decisions whose effect on GDP may take years, and on government spending, as the deficit also depends on spending decisions.

Overall, 'even larger' tax cuts are very unlikely to significantly reduce the deficit. With the economy near full employment, rates probably below the Laffer peak and receipts already 33% lower, they would most likely widen it, at least in the short to medium run, and the deficit is so large that no single policy could eliminate it.

5. continued

state border, weakening the tax.

Overall, the subsidy is most likely to correct the market failure from cigarettes, cutting their use by 22% v 4%, provided e-cigarettes really are less harmful; otherwise the tax is the safer, if weaker, option.

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