Surname	StemUp Model Solution	Centre Number	Candidate Number
Other Names			2

GCE A LEVEL

1520U30-1

S19-1520U30-1

MONDAY, 20 MAY 2019 – MORNING

ECONOMICS – A2 unit 3
Exploring Economic Behaviour

2 hours

	For Examiner's use only		
	Question	**Maximum Mark**	**Mark Awarded**
Section A	**1**	**4**	
	2	**6**	
	3	**6**	
	4	**11**	
	5	**7**	
	6	**6**	
Section B	**7**	**6**	
	8	**10**	
	9	**10**	
	10	**14**	
	Total	**80**	

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01

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.

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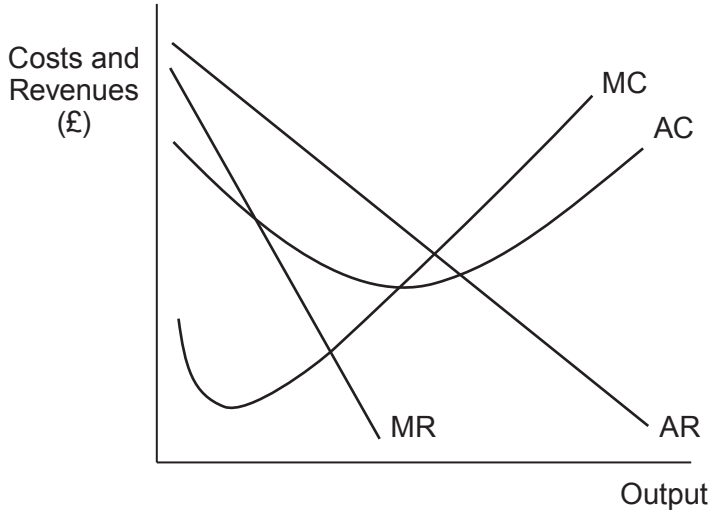
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SECTION A

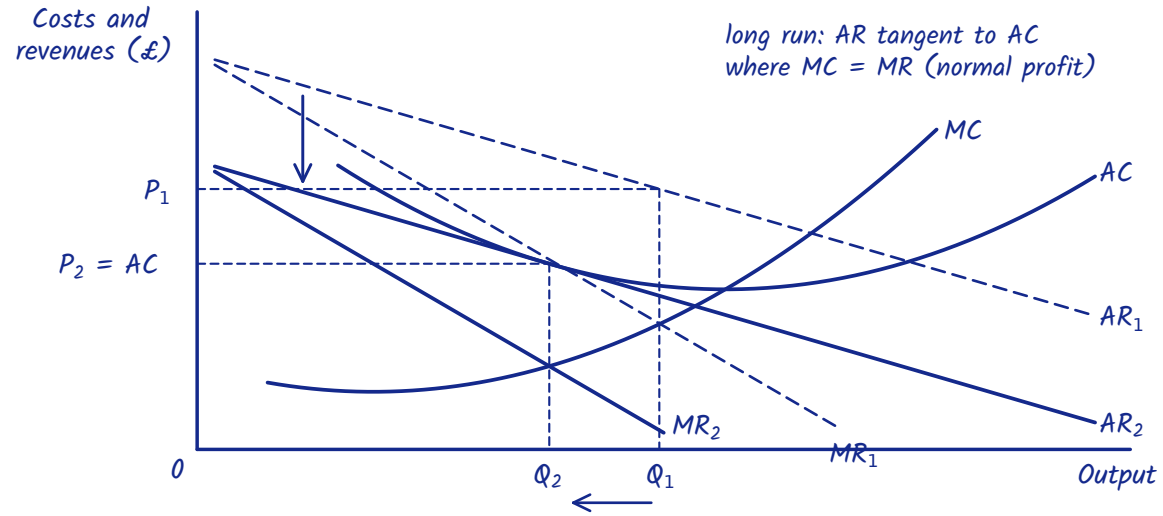
Answer **all** *questions in the spaces provided.*

1. The diagram below shows a profit-maximising firm operating in monopolistic competition in the short-run.



Explain, with the aid of a diagram, what will happen to the level of output produced by this firm in the long-run. [4]

Draw your diagram in the space below.



In the short run AR > AC at Q_1, so the firm makes supernormal profit. Low barriers to entry let new firms enter, taking customers, so each firm's demand falls and AR and MR shift left (AR_1 to AR_2) until AR is tangent to AC at the output where MC = MR. Output falls from Q_1 to Q_2, where only normal profit is made (AR = AC).

4

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2. The table below provides cost and revenue information for "Bowled Over", a firm producing hand-made wooden bowls.

Output of bowls	Market price per bowl (£)	Total cost (£)
0	-	50
1	45	75
2	40	84
3	35	92
4	30	97
5	25	100
6	20	103
7	15	105

(a) At what level of output does the firm earn normal profit? Justify your answer. [2]

Output 7. Normal profit is earned where AR = AC (TR = TC). At 7 bowls, AC = £105 ÷ 7 = £15 = price (AR), and TR = 7 × £15 = £105 = TC, so profit is zero (normal profit).

(b) At what level of output does the firm maximise its revenue? Justify your answer. [2]

Output 5. TR = P × Q: 45, 80, 105, 120, 125, 120, 105. TR is highest at £125 when 5 bowls are sold, where MR = 0 (MR is +£5 from 4 to 5 bowls and −£5 from 5 to 6).

(c) State and explain **one** possible social or community objective that "Bowled Over" may choose to pursue. [2]

Sourcing wood only from sustainable, local forests. This protects the environment and may let Bowled Over charge a higher price to ethical consumers, even if profit is not maximised.

1520U301 03

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3. In May 2016, the German Cartel Office imposed a fine of €91.5m on several retailers, including Lidl and Netto, for colluding to fix the prices of beer, sweets and coffee.

The price-fixing in the beer market was co-ordinated by the beer brewing company, AB InBev. The president of the Cartel Office, said: "In the sale of beer brands, the brewery agreed with retailers to raise prices and co-ordinated the details between them, in particular… the level of the respective price increase. The retailers expected that the brewery would ensure that the price increase was simultaneously implemented by competing retailers. The ones suffering from such practices are the end consumers." AB InBev avoided fines because of the company's extensive cooperation with the Cartel Office.

(a) Define the term 'interdependence'. [1]

Interdependence is when firms in an oligopoly must take into account the likely reactions of their rivals when making pricing or output decisions.

(b) Using the data and your own knowledge, explain **two** conditions under which price collusion is more likely to occur. [5]

1. A small number of firms in a concentrated market (oligopoly). With few sellers, such as Lidl, Netto and a few rival supermarkets, it is easy to agree and coordinate prices, and to monitor whether any firm breaks the agreement. Here AB InBev co-ordinated "the level of the respective price increase" and made sure it was "simultaneously implemented by competing retailers", so no retailer could undercut the others and win market share. The firms then act like a joint monopoly.

2. Homogeneous products with price inelastic demand. Beer, sweets and coffee brands are identical in every store and habitual purchases, so PED is inelastic. If all retailers raise prices together, consumers cannot switch to a cheaper retailer and quantity falls by proportionately less than price, so total revenue and profit rise. This gives a strong incentive to collude, and identical products make a single agreed price easy to set, at the expense of "end consumers".

6

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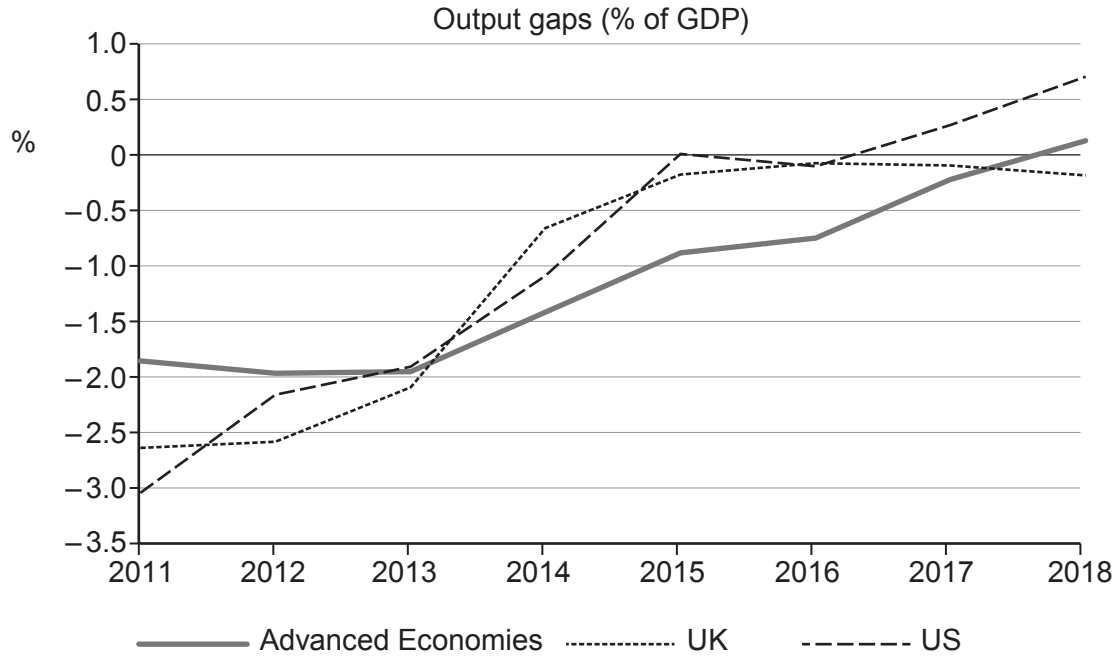
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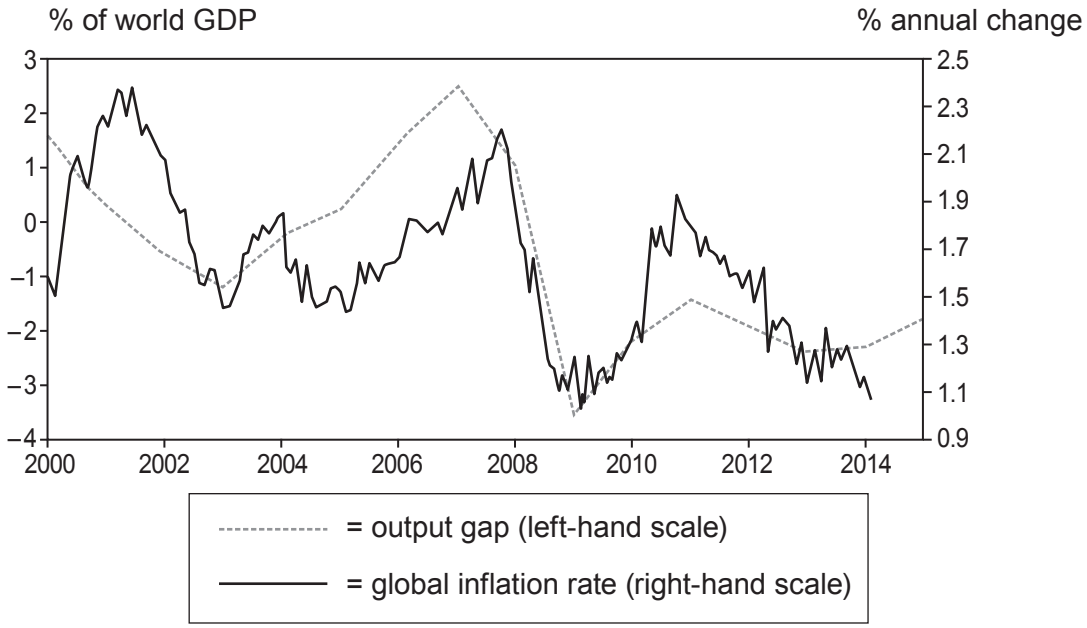
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4. Chart 1 – output gaps in the UK, US and advanced economies as a whole, 2011-2018



Central bankers often link an economy's rate of inflation to the size of the output gap in that country. Some economists have recently taken this argument a step further, and believe that the global economy's output gap is now more important than an individual economy's output gap in determining the rate of inflation in a country – this is because of globalisation. In other words, the relatively low inflation experienced by many countries since the mid-1990s is due to global spare capacity. The increasing inter-connectedness between different economies can put some downwards pressure on domestic prices if, for example, imported raw materials and commodities become cheaper. However, there are other factors that can also affect domestic inflation rates.

Chart 2 – global output gaps and global inflation rates, 2000-2014



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(a) Using Chart 1, compare and contrast the data on output gaps for the UK and the US. [4]

Similarity: in 2011 both had a negative output gap, the UK about −2.6% of GDP and the US larger at about −3.1%. Both gaps then narrowed steadily, reaching close to zero in 2015 (UK about −0.15%, US about 0%).

Difference: since 2016 the US has had a growing positive output gap, about +0.7% of GDP in 2018, whereas the UK has had a negative output gap throughout, still about −0.2% in 2018, so the UK has never operated above trend output.

(b) With reference to all the information provided, assess the view that a negative output gap in an economy will always result in a fall in the rate of inflation. [7]

A negative output gap means actual GDP is below potential GDP, so there is spare capacity. Workers lose bargaining power and resources are less scarce, so wages and factor prices fall, cutting firms' costs, and weak demand stops firms raising prices, so inflation should fall.

Chart 2 supports this weakly: global inflation fell to its lowest, about 1.1%, in 2009 when the global output gap hit about −3.8%, and both peaked in 2007 to 2008.

Many countries have had low inflation since the mid-1990s.

However, it will not always happen. Global spare capacity may matter more than domestic: the UK had a negative gap for the whole period, yet UK inflation reached about 4.5% in 2011 as import and commodity prices rose and VAT increased. In 2010 to 2011 global inflation rose to about 2% while the global gap was still negative. A fall in SRAS (e.g. oil price shock, 1970s stagflation) can cause a negative gap and higher inflation together, and sticky wages or QE and low interest rates can keep prices rising. Output gaps are also hard to measure.

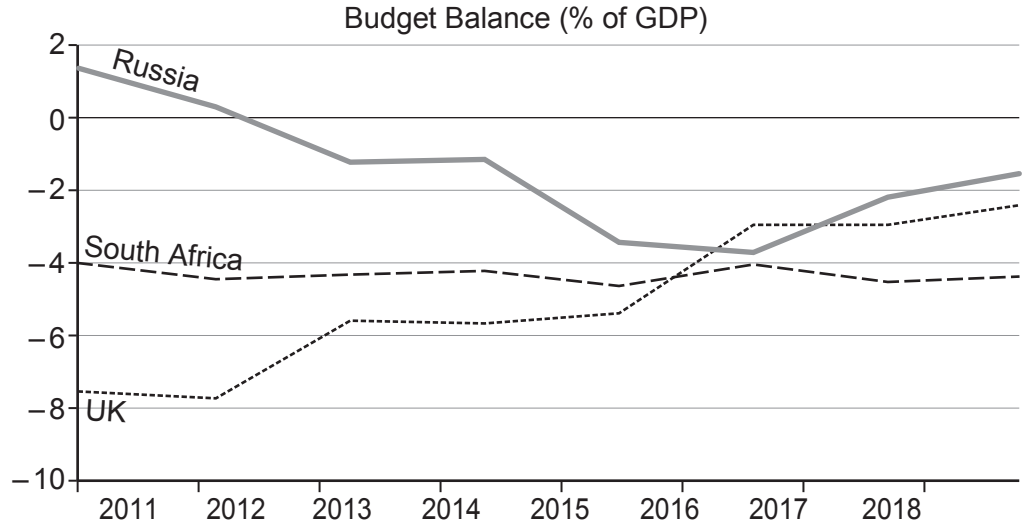
Overall, a negative output gap usually reduces inflationary pressure, but not always: it depends on the cause of the gap, global conditions and policy.

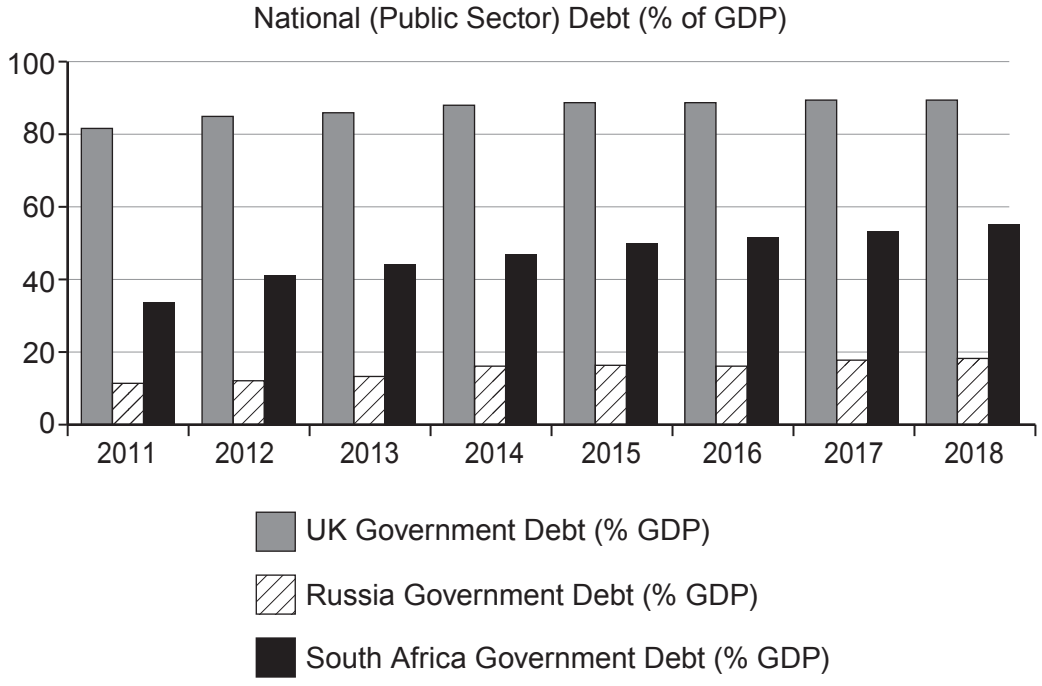
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5. The charts below provide data from the International Monetary Fund (IMF) on government finances for the UK, Russia and South Africa from 2011 to 2018.





With reference to the data, evaluate the likely relationship between a government's budget balance and its national debt. [7]

A budget deficit means government spending exceeds tax revenue in a year, so the shortfall must be borrowed. National debt is the accumulated stock of past borrowing, so a deficit adds to the debt and a surplus allows debt to be repaid.

The data largely supports this. All three countries ran deficits for most of the period

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and all saw debt rise. Russia moved from a surplus of about 1.3% of GDP in 2011 into deficit from 2012 (peak about 3.8%), and its debt rose from about 10% to 18% of GDP, which is what we would expect. South Africa ran a constant deficit of about 4% to 4.5% and debt rose the most, from about 32% to 56% of GDP. However, the relationship is not simple. The UK cut its deficit from about 7.8% to 2.2% of GDP, yet debt still rose from about 81% to 88%, because any deficit, even a smaller one, still adds to the debt. Both are measured as % of GDP, so a change in GDP alters the ratios: slow growth raises debt/GDP without more borrowing. Debt can also rise for other reasons, such as higher interest rates and compounding interest on the existing debt, one-off costs like buying bank shares, or PFI deals that create future liabilities while keeping deficits low now.

Overall, persistent deficits do raise national debt, but whether the debt ratio rises depends on the deficit relative to GDP growth and interest costs, so a falling deficit does not mean falling debt.

1520U301 09

7

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6. The table below shows China's annual money supply growth rate and annual inflation rates for selected dates.

	2012	2013	2014	2015	2016	2017
Money supply growth rate	14.8%	14.2%	12.9%	13.1%	11.5%	9.2%
Inflation rate	1.9%	3.1%	1.6%	1.6%	1.9%	1.6%

To what extent does the data provide evidence to support the quantity theory of money? [6]

The quantity theory of money says that changes in the money supply cause changes in the price level. Fisher's equation MV = PT, with V (velocity) and T (transactions) assumed constant, means a rise in M leads to a proportional rise in P. Extra money raises AD; with output fixed this raises prices.

There is some supporting evidence. Money supply growth peaked at 14.8% in 2012 and inflation peaked a year later at 3.1% in 2013, suggesting a time lag. Money supply growth rose slightly from 12.9% to 13.1% in 2014 to 2015, and inflation then rose from 1.6% to 1.9% in 2016. Overall both trend downwards: money growth slowed to 9.2% and inflation fell from 1.9% to 1.6%.

However, the evidence is weak. Money supply grew by 9.2% to 14.8% a year but inflation was only 1.6% to 3.1%, far from proportional. Money growth fell sharply from 14.8% to 9.2% while inflation in 2017 (1.6%) was the same as in 2014 and 2015, so other factors (oil and food prices, the exchange rate) matter more. China's real GDP was growing at around 7%, so T is not constant and much of the money was absorbed by rising output, and V may change. Only six years of data are given, and China's money supply and CPI are hard to measure accurately.

Overall, the data gives only limited support: there is some correlation with a lag, but inflation is not proportional to money growth.

6

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SECTION B

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

In the UK in 2016, growth in the "digital economy" outperformed average economic growth. However, it still only accounted for around 5% of the 32.1m jobs in the economy, 9% of firms and 7% of actual growth. These figures are similar to those in the US, although lagging behind countries such as South Korea.

Wales has the fastest growing digital economy outside London, with the number of digital firms (selling anything from software and app development to ICT consultancy) in Wales jumping by 9.2% from 2015 to 2016. The number of digital firms in London rose by 11.6% to 41 940 during the same period. The Welsh Government estimates there are currently more than 600 firms in the IT sector alone, employing an estimated 30 000 people – around 3.5% of the Welsh workforce.

A Welsh Government report suggests that ICT investment can boost an economy's productivity by up to 30%. Improved ICT can reduce the costs of communication between firms, lower the barriers to entry into many markets, and enable new products and services to be produced. Small firms can share departments, such as accounting and marketing, with other small firms by using ICT more effectively; this reduces costs and makes existing factors of production more efficient. The valuable Welsh tourism industry in particular should benefit as ICT can improve bookings and payments systems as well as marketing.

> The owner of a small business, LoveCraft (selling knitting and craft items) reported that in 2015, selling just in the UK, his revenue was £6.5m. After signing up to an international payment services provider for just £75 per month, his 2016 revenue was £10.9m, with growth coming entirely from overseas customers.

Wales has emerged as one of the fastest growing UK regions in recent years, with the digital economy a key driver of growth. The surge in new business creation in the technology sector in Cardiff is fuelling a jobs boom, which is "rippling out" to the wider South Wales region. For example, 30 000 more jobs are expected in the region as a result of the government's proposed "internet coast" plans around Swansea Bay.

However, one concern is whether Wales is able to hold on to new digital firms once they reach a certain scale, or whether these businesses will try to expand into other regions such as London. It is vital that good literacy, numeracy and science education is provided to help Welsh people find employment in this fast-growing sector. The Welsh Government acknowledged these requirements in its Digital Wales programme. The programme's aims include:

- **Skills:** technology will be used to improve teaching and learning in schools; adults will all be given opportunities to learn new digital skills for everyday life; workers will be equipped with specialist skills for digital industries
- **Economy:** Welsh companies will be encouraged to work with digital research departments in universities, and Welsh companies will be supported in accessing new digital markets
- **Infrastructure:** fair and equal access to broadband and mobile phone network coverage.

In addition to supporting small UK businesses, the digital economy is supporting economic development in many LEDCs. In India, for example, farmers struggle with drought, crop diseases, lack of modernisation and low market prices. A new app called Plantix, developed by scientists in Germany, may be about to change their lives. The Plantix app allows users to take photos of their crops and then it identifies the likely problem and suggests a solution. The falling global price of smartphones has meant that many people in India, even poor farmers, can now afford smartphones

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giving them access to the internet for the first time. In one Indian village, Karlapalem, 500 farmers now share 20 smartphones. Similar apps are used by African farmers; ImageIT helps farmers to use expensive fertilisers more efficiently so that only the crops needing the fertiliser receive it. These apps are nearly always free for farmers to use because each time they use them, they provide information to global databases monitoring global food security. Improved data is leading to increased efficiency in other areas too. In Kenya, mobile data is being used to identify malaria infection patterns and identify problem areas – this helps improve healthcare provision. Vehicle sensor data from delivery trucks in many countries has enabled companies to save millions of gallons of fuel and reduce emissions by the equivalent of taking thousands of cars off the road for a year.

The increasingly digital global economy is not without its disadvantages. The apps, for example, are most likely to benefit those who are literate; in many LEDCs, the very poorest, especially women, cannot read and this can worsen inequality. Many rural areas may still struggle for affordable internet access. App developers, often large monopolies in developed countries, have gained huge amounts of personal data on their users which they then sell to other companies or use to improve their own products. It is often said that the global digital economy benefits those living in MEDCs more than LEDCs.

7. Using the data in paragraphs 1 and 2, calculate:

(a) The number of people employed in digital industries in the UK in 2016. [2]

5% × 32.1m = 0.05 × 32 100 000 = 1 605 000 people (1.605m)

(b) The number of digital firms in London in 2015. [2]

2015 = 41 940 × 100 ÷ 111.6 = 37 580.6

= 37 581 digital firms

(c) The total size of the Welsh workforce. [2]

3.5% = 30 000, so workforce = 30 000 × 100 ÷ 3.5

= 857 143 workers

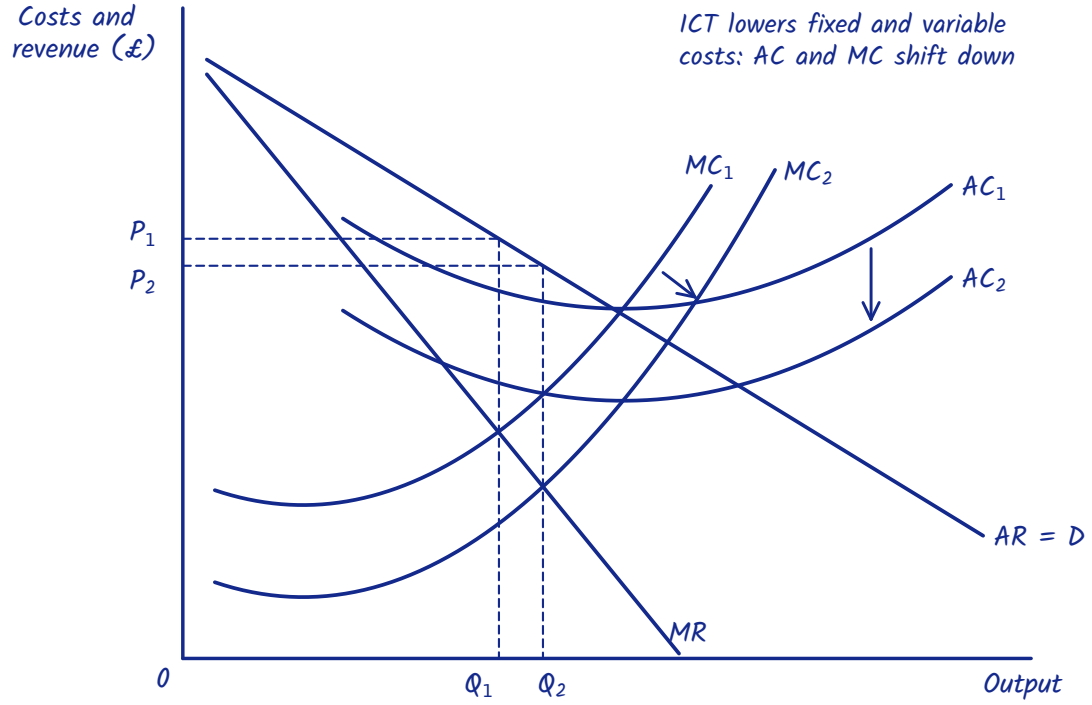
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8. Using a cost and revenue diagram, evaluate the likely impact of ICT investment on a small firm's costs. (lines 10-14) [10]

Draw your diagram in the space below.



Costs are the payments for factors of production: fixed costs (e.g. rent, accounting staff) do not change with output, while variable costs (e.g. materials, communication per order) do. ICT investment is an initial fixed cost, but it can lower both types of cost per unit.

Lines 10 to 14 say ICT can boost productivity by up to 30% and "reduce the costs of communication between firms". Small firms can "share departments, such as accounting and marketing" with other small firms, cutting fixed overheads, while cheaper communication and better real-time information on stock and orders cut variable costs and "make existing factors of production more efficient". As the diagram shows, AC and MC shift down from AC_1 and MC_1 to AC_2 and MC_2. The profit maximising firm (MR = MC) raises output from Q_1 to Q_2 and lowers price from P_1 to P_2, and profit rises because the gap between AR and AC widens. LoveCraft shows this: a payment service costing just £75 a month (£900 a year) let revenue rise from £6.5m to £10.9m, a 68% rise, so the cost per sale fell sharply.

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However, the impact depends on several factors. ICT has significant extra costs, such as website design, broadband, software licences, cyber security against hacking and staff training, which may be too large for very small firms to cover, so AC could rise in the short run. Gains also depend on staff ICT skills, which Digital Wales may not supply in time. Productivity may even fall if staff are distracted by emails and

10

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9. Evaluate the likely impact of ICT investment on the Welsh labour market. [10]

ICT investment adds to the capital stock and is a component of AD (I). Labour demand is a derived demand, so any rise in output raises demand for workers, and better capital raises the productivity of labour.

First, the rise in I increases AD and, through the multiplier, real GDP and jobs. The number of digital firms in Wales rose by 9.2% from 2015 to 2016, the fastest outside London, and the IT sector already employs 30 000 people, 3.5% of the Welsh workforce. The Cardiff tech boom is "rippling out" to the wider South Wales region and 30 000 more jobs are expected from the "internet coast" around Swansea Bay, so employment could double. As labour demand shifts right, wages rise, especially for scarce digital skills. Second, ICT can raise productivity by up to 30%, so the marginal revenue product of labour rises, supporting higher real wages, and lower costs shift SRAS and LRAS right, raising output without inflation. Third, ICT makes the labour market more flexible: home working, gig work and selling online through platforms let people who cannot work regular hours enter the labour force, raising participation rates, including in rural areas.

However, the impact depends on several factors. Workers need the right skills: unless Digital Wales succeeds in improving literacy, numeracy and specialist skills, the new jobs will be filled by migrants from elsewhere or left vacant, causing structural unemployment for Welsh workers. ICT can replace labour with capital, e.g. online booking in tourism replaces receptionists, so low-skilled jobs may be lost. Wales may not keep growing firms, which could relocate to London, so the multiplier leaks out of Wales. The gains may be concentrated in Cardiff and Swansea rather than the Valleys, widening regional inequality, and gig jobs can mean underemployment and insecure pay. The decline of other industries such as manufacturing may offset the gains.

Overall, ICT investment is likely to raise employment and wages in the Welsh labour market, as shown by the 30 000 extra jobs expected. However, the long-run impact depends mainly on Welsh skill levels and on keeping firms in Wales; with successful

10

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10. There are several ways of measuring economic development in an economy. One method is the Human Development Index (HDI).

(a) With reference to the data, describe **two** possible indicators of development, other than the HDI, that could be used in response to the increasingly digital global economy. [4]

1. Smartphone ownership per 100 people (or smartphone price relative to income).

Phones give access to apps and markets, e.g. Plantix needs a smartphone with a camera, yet in Karlapalem 500 farmers share just 20 smartphones (1 per 25 farmers).

2. Adult literacy rate by gender. The apps mostly benefit those who are literate, and in many LEDCs the very poorest, especially women, cannot read (line 49), so female literacy shows who can actually gain from the digital economy.

(b) With reference to the data, evaluate the view that the increasingly digital global economy will raise living standards in LEDCs. [10]

Living standards depend on real income per head and on wider welfare such as health, education and the environment.

The digital economy can raise living standards in LEDCs. The falling global price of smartphones means even poor Indian farmers can now access the internet. Apps such as Plantix diagnose crop diseases and ImageIT targets expensive fertiliser only at crops that need it, cutting costs and raising yields. Higher, more stable farm incomes allow saving and investment, and since most of the poor in LEDCs work in agriculture, this cuts poverty. The apps are nearly always free, so the gains are cheap to obtain. Better data also improves welfare: in Kenya mobile data identifies malaria patterns, improving healthcare and life expectancy, and vehicle sensor data saves fuel and cuts emissions.

Firms in LEDCs can reach global markets cheaply, as LoveCraft did with a £75 a month payment service, and digital jobs create multiplier effects, as the 30 000 expected jobs in South Wales show.

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However, the benefits are uneven. Apps help mainly the literate, so the poorest, especially women, gain little and inequality can worsen (lines 48 to 50). Many rural areas still lack affordable internet access, and sharing 20 phones between 500 farmers gives power to those who own the technology. App developers are often large monopolies in MEDCs that sell users' personal data, so much of the value created flows to developed countries and there is a loss of privacy. Even in the UK the digital economy is only about 5% of jobs and 7% of growth, so its effect on overall living standards may be modest. Apps can also misdiagnose problems or reduce traditional farming skills.

Overall, the digital economy is likely to raise living standards in LEDCs, especially for farmers and through better healthcare. The extent depends on improving literacy, especially for women, and rural internet access, and on regulating monopoly app developers. Without this, average living standards may rise while inequality widens, and

14

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8 screens, raising AC rather than lowering it. ICT also lowers barriers to entry (line 11), so more competition may reduce each firm's demand, lowering output and raising AC. Benefits vary by sector: tourism gains from cheaper booking and payments, but a workshop's material costs may barely change.

On balance, ICT is likely to lower a small firm's costs in the long run through shared overheads and cheaper communication, as LoveCraft shows, but the size of the fall depends on the firm's scale, staff skills and sector, and in the short run set-up costs may outweigh the savings.

9 Digital Wales training the gains could be large and widespread, without it they may mostly go to workers from outside Wales.

10(b) the digital economy will continue to benefit MEDCs more than LEDCs.

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