



Rewarding Learning

ADVANCED

General Certificate of Education

2018

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# Economics

Assessment Unit A2 1  
*assessing*  
Business Economics



AEC11

[AEC11]  
**TUESDAY 5 JUNE, AFTERNOON**

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## TIME

2 hours.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number on the Answer Booklet provided.  
Answer **all** questions in Section **A** and **B** and **one** question in Section **C**.  
You are permitted to use a calculator in this paper.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 90.

- Section A: 20 marks
- Section B: 40 marks
- Section C: 30 marks

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

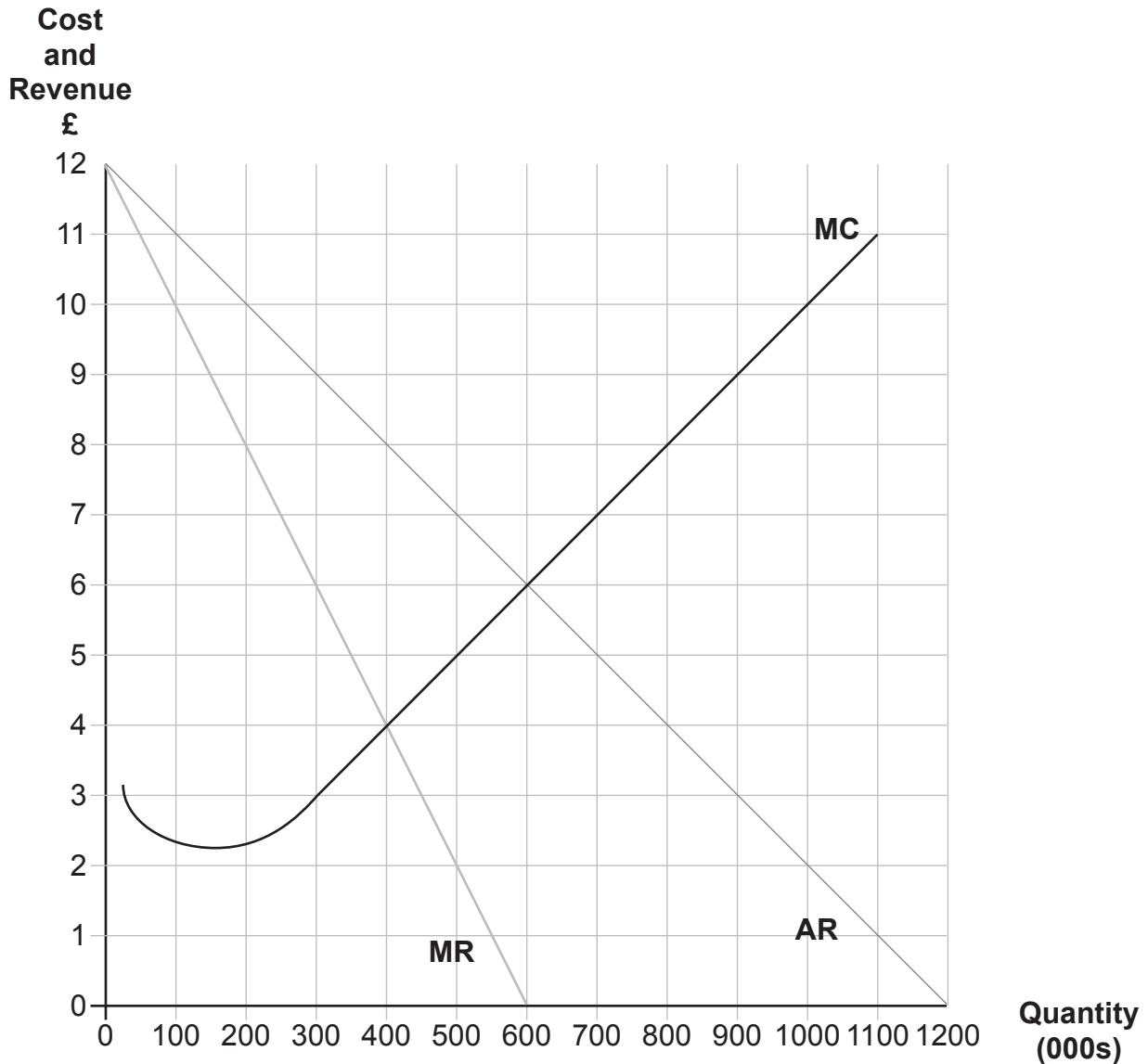
## ADVICE TO CANDIDATES

You are advised to take account of the marks for each part question in allocating the available examination time. In questions involving calculations, you are advised to show your workings. Quality of written communication will be assessed in Questions **4**, **5 (b)**, **(c)** and **(d)**, **6** and **7**. Quantitative skills will be assessed where appropriate.

## Section A

Answer all questions (20 marks)

- 1 The diagram below depicts the average revenue, marginal revenue and marginal cost curves for a firm operating in a monopolistically competitive market.



Using the diagram, calculate the following.

- (a) The total revenue the firm would earn if it operated at the profit maximising point. [3]
- (b) The **increase** in total revenue the firm would gain if it switched from a policy of maximising profits to a policy of maximising revenue. [3]

- 2** Castle Engineering Ltd is a company which manufactures unique precision components for the medical industry. They have recently developed an innovative laser cutting device. Manufacture of this device involves total fixed costs of £90,000 and variable costs of £250 per unit. The firm intends to use a cost plus pricing strategy with a 30% mark-up on the average total cost of each unit.

**(a)** Calculate the average total cost to the firm of producing 300 units. [3]

**(b)** Calculate the price the firm will charge for each device at this production level. [2]

- 3** A report published recently has suggested that public sector workers in Northern Ireland earn almost 40% more than those employed in the private sector.

With the aid of appropriate examples, explain the distinction between the private sector and public sector. [3]

- 4** Shagpile Mats is a small independent retailer which sells mats for household and industrial use. The firm has traditionally operated by selling its mats from a high street unit at the market equilibrium price. However, it has recently set up an online auction site and intends to close down the shop and only sell online using perfect price discrimination.

With the aid of an appropriate diagram, analyse the likely impact on total revenue if Shagpile Mats switches from selling at the market equilibrium price to using perfect price discrimination. [6]

## Section B

### Answer all questions (40 marks)

The following passages were compiled in August 2016.  
Read them carefully and answer the questions which follow.

#### Case study: To merge or not to merge?

##### Source 1: The UK mobile phone market

The UK mobile phone market is one of the most developed in the world and, in many respects, it is also one of the most competitive and successful: 93% of adults in the UK have a mobile phone contract, with almost 30% having more than one. Approximately three-quarters of the adult population own a smartphone and the UK is one of the most advanced countries in terms of roll-out of fourth generation (4G) technologies and take-up of 4G services.

There are about thirty mobile phone providers in the UK who compete intensely for customers. This competition helps to ensure that UK customers have access to a wide variety of bundles and services at prices which are lower than most other rich countries.

**Fig. 1** below shows the monthly price of a standard mobile contract in the UK and five other major economies.

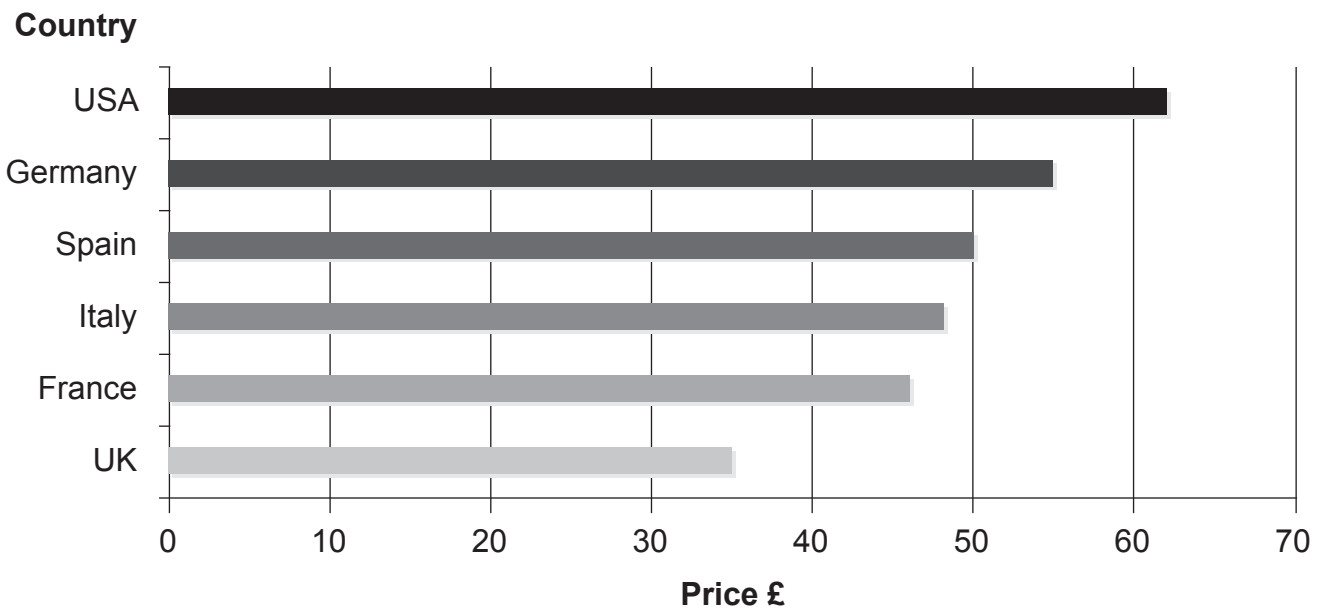


**Fig. 1:** Estimated monthly price of standard mobile phone contract in selected countries, July 2016

While there may be thirty mobile phone providers, the market is dominated by four large companies (EE, O2, Three and Vodafone) who actually own, run and maintain a physical network infrastructure. **Fig. 2** below shows two separate estimates of market share for the UK mobile phone market in 2016.

| Company  | Market share % (revenues) | Market share %<br>(no. of subscribers) |
|----------|---------------------------|----------------------------------------|
| EE       | 33                        | 29                                     |
| O2       | 21                        | 29                                     |
| Vodafone | 18                        | 23                                     |
| Three    | 10                        | 12                                     |
| Other    | 18                        | 7                                      |

**Fig. 2**

The other twenty-six companies are known as virtual network operators and include companies such as Virgin Media, Talk Talk and Dixons Carphone's iD. These virtual network operators do not own the networks they use to provide mobile services to UK consumers. Instead, they enter into agreements with one of the four network operators to access their network at wholesale prices.

## **Source 2: O2 and Three announce merger plans**

Hutchison, the Hong Kong-based company that owns the Three network, has confirmed that it is in advanced talks to buy rival network O2 from Spain's Telefonica for a cool £10.25bn. While the deal has been agreed by both companies, it still needs to be approved by the relevant regulatory authorities. Once completed, the Three/O2 partnership will make it the biggest mobile network in the UK, potentially offering the widest coverage and the fastest speeds.

The potential merger mirrors similar mergers in the UK and abroad, which have reduced the number of alternative network providers available to consumers. Both Three and O2 claim that it is only through consolidation that they can gain the scale required to justify the huge investment needed to roll out high-speed 3G and 4G networks.

Joseph Daly, a telecoms analyst, stated, "The huge fixed costs associated with the development of a network capable of delivering 4G services to the whole of the UK means that the industry can only accommodate two or three big players. Fast-moving, high-tech industries such as telecoms naturally tend towards oligopoly. While regulators may worry about the lack of competition, the reality is that we cannot have an efficient and innovative telecoms industry in the UK with lots of small network providers competing for market share."

### Source 3: O2 still for sale as Brussels blocks merger with Three

EU Competition Commissioner Margrethe Vestager has sent shockwaves through the European telecoms market by announcing that the Commission would not allow Hutchison to merge O2 with its own mobile operator Three. In a statement explaining the decision, Commissioner Vestager stated, “Allowing Hutchison to take over O2 at the terms they proposed would have been bad for UK consumers and bad for the UK mobile sector. We had strong concerns that consumers would have had less choice finding a mobile package that suited their needs and would have paid more than without the deal. It would also have hampered innovation and the development of network infrastructure in the UK, which is a serious concern especially in fast-moving markets.”

Not everyone, however, agrees with this assessment of the proposed merger. Market analyst Tom Ridgeway said, “A combined O2/Three would provide a counterbalance to the strength of BT/EE, by offering an alternative source of capacity to the virtual network providers who would provide competition in their own right. The EU’s decision is a short-sighted one that fails to take into account the need for a viable competitor of comparable scale and the potential to use other forms of state intervention to protect consumers. Competition authorities have a range of alternative tools at their disposal. If used properly, these would allow the combined company to benefit from the scale advantages while still protecting consumer choice and maintaining the relatively low mobile phone prices that exist in the UK.”

- 5 (a) Using the information in **Fig. 1**, compare the price of a standard mobile phone contract in the UK with that of the USA and France. [4]
- (b) Using the information in **Fig. 2**, explain why it might be difficult to accurately estimate market share for the UK mobile phone market. [9]
- (c) Examine the extent to which the UK mobile phone market could be described as a natural oligopoly. [12]
- (d) The European competition authorities decided to prohibit the proposed merger of O2 and Three. Critically examine some of the alternative measures that regulators could take to ensure the UK mobile market functions well for consumers. [15]

## Section C: Essay section

### Answer one question (30 marks)

- 6 The theory of contestable markets was often cited by regulators and academic economists as justification for the deregulation of the US airline industry in the mid 1980s. However, experience since then would suggest that the deregulation did not lead to lower prices and greater efficiency. Instead, it led to a round of mergers and consolidation and accusations of price fixing, all of which would have been predicted by the traditional theory of the firm.

Critically examine the view that the theory of contestable markets is no better at predicting the behaviour of real world firms than the much criticised theory of perfect competition. [30]

- 7 German supermarket Lidl is planning to strategically reposition the company in the UK away from a high-volume discounter towards a mainstream one-stop supermarket. The German giant is actively aiming to boost quality perceptions through store expansions, more careful merchandising, heavy investment in advertising and the introduction of loyalty cards. Critics of the move have suggested that it will ultimately lead to higher prices for UK consumers.

Critically examine the view that consumers benefit more from non-price competition than from price competition. [30]

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**THIS IS THE END OF THE QUESTION PAPER**

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## Sources

- Source 1: Reference from: EU Commission blocks Three-O2 telecoms merger by Daniel Thomas, Telecoms Correspondent MAY 11, 2016. <https://www.ft.com/content/32018c52-1695-11e6-9d98-00386a18e39d>
- Source 2: Reference from: UK regulator wants European commission to block Three-O2 deal by Sean Farrell. Published by The Guardian, 11 April 2016 <https://www.theguardian.com/business/2016/apr/11/uk-regulator-wants-european-commission-to-block-three-o2-deal>
- Source 3: Reference from: O2-Three merger threatens long-term damage, says CMA. BBC News, 11 April 2016 <https://www.bbc.co.uk/news/business-36013082>

|                |                                                                                |
|----------------|--------------------------------------------------------------------------------|
| Surname        | <i>StemUp Model Solution</i>                                                   |
| Answer booklet | Write the question number in the left-hand margin at the start of each answer. |

Question  
number

1(a)

*Profit is maximised where  $MC = MR$ , which occurs at an output of 400,000 units. Reading up to the AR curve, the price charged is £8.*

$$TR = P \times Q = £8 \times 400,000 = £3,200,000$$

1(b)

*Revenue is maximised where  $MR = 0$ , at an output of 600,000 units, where AR gives a price of £6.*

$$TR = £6 \times 600,000 = £3,600,000$$

$$\text{Increase in TR} = £3,600,000 - £3,200,000 = £400,000$$

2(a)

$$\text{Total variable cost} = 300 \times £250 = £75,000$$

$$\text{Total cost} = £90,000 + £75,000 = £165,000$$

$$ATC = £165,000 \div 300 = £550 \text{ per unit (AFC } £300 + \text{ AVC } £250)$$

2(b)

*Price =  $ATC \times 1.3 = £550 \times 1.3 = £715$  per device (a mark-up of £165 on each unit).*

3

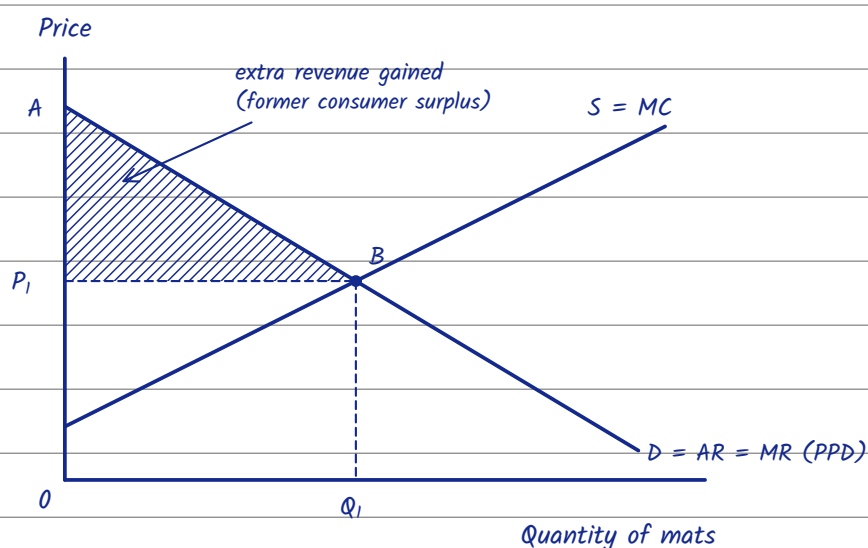
*The private sector consists of organisations that are owned and controlled by private individuals or shareholders, not by the government, and which usually aim to make a profit, for example Tesco, Apple or a local engineering firm such as Castle Engineering Ltd.*

*The public sector consists of organisations that are owned, funded and operated by the government (central or local) to provide goods and services, often financed through taxation, for example the NHS, the civil service and state schools.*

4

Perfect (first degree) price discrimination occurs when a firm charges each consumer the maximum price he or she is willing to pay for each unit, so no two units are sold at the same price. It requires the firm to have some price-setting power, to know each buyer's willingness to pay and to prevent resale (market seepage). An online auction is ideal for this: each mat goes to the bidder who values it most, at a price close to their reservation price, and buyers reveal their willingness to pay through their bids.

Total revenue is price  $\times$  quantity. At the market equilibrium price  $P_1$ , Shagpile sells  $Q_1$  mats, so TR is the rectangle  $OP_1BQ_1$  in the diagram below. Every buyer pays  $P_1$ , even those willing to pay much more, so the triangle  $AP_1B$  is consumer surplus.



As the diagram shows, under perfect price discrimination each unit is sold at the price on the demand curve, so the demand (AR) curve also becomes the MR curve. The firm still sells  $Q_1$ , where MC (supply) meets demand, but TR rises to the whole area under the demand curve,  $OABQ_1$ . Total revenue therefore increases by the hatched area  $AP_1B$ : all of the former consumer surplus is converted into revenue for the firm.

The size of the gain depends on how inelastic demand is (a steeper demand curve gives a larger triangle) and on how accurately the auction extracts each

buyer's reservation price. In practice bidders may shade their bids, so revenue would rise by somewhat less than ABP, and closing the shop could lose some customers. However, online selling also cuts the rent and staff costs of the high street unit, so profit should rise by even more than revenue.

5(a)

Fig. 1 shows that the UK has the cheapest standard contract of the six countries, at about £35 a month, compared with about £62 in the USA (the most expensive) and about £46 in France (the second cheapest).

UK v USA:  $£62 - £35 = £27$  cheaper per month, i.e.  $27 \div 62 \times 100 = 43.5\%$ , roughly 45% cheaper (the US price is about 77% higher).

UK v France:  $£46 - £35 = £11$  cheaper per month, i.e.  $11 \div 46 \times 100 = 23.9\%$ , almost 25% cheaper. So even the next cheapest country is nearly a quarter dearer than the UK.

5(b)

Market share is the proportion of total sales in a market accounted for by one firm, brand or product. It is usually calculated as a firm's sales revenue  $\div$  total market revenue  $\times 100$ , which is the method in column 2 of Fig. 2. Alternatively it can be measured by volume, i.e. a firm's number of subscribers  $\div$  total subscribers  $\times 100$ , as in column 3. Adding the shares of the largest firms gives a concentration ratio, e.g. the four-firm ratio.

The first difficulty is that the figure depends on the measure used. O2 has a 21% share by revenue but 29% by subscribers, which suggests O2 earns less revenue per customer than EE, whose share falls from 33% by revenue to 29% by subscribers. On revenue EE looks clearly dominant, yet on subscribers EE and O2 are joint leaders. The four-firm concentration ratio is 82% by revenue (33 + 21 + 18 + 10) but 93% by subscribers (29 + 29 + 23 + 12), so the 'other' operators hold 18% or just 7% depending on the measure. Neither figure is wrong; they simply measure different things.

Second, the market must be defined in terms of product. Shares will differ if we include pay as you go and SIM-only deals as well as monthly contracts, or

count mobile broadband and business contracts. The source notes that almost 30% of adults hold more than one contract, so counting subscriptions rather than customers will overstate some firms' shares.

Third, the geographical boundary matters. EE's national share is about 33% but its share in some regions or cities where its coverage is strongest may be far larger, so a national figure can understate local market power.

Fourth, there is the treatment of the virtual network operators such as Virgin Media and iD. Their customers use the networks of the big four at wholesale prices, so it is unclear whether they should be counted as separate competitors or as part of the host network's share. Finally, accurate data is hard to collect because the market is huge and fast-changing, with customers switching contracts constantly, so any estimate (and the 2016 figures here are 'estimates') is soon out of date. Market share could also be measured by employment or output capacity, giving yet another answer.

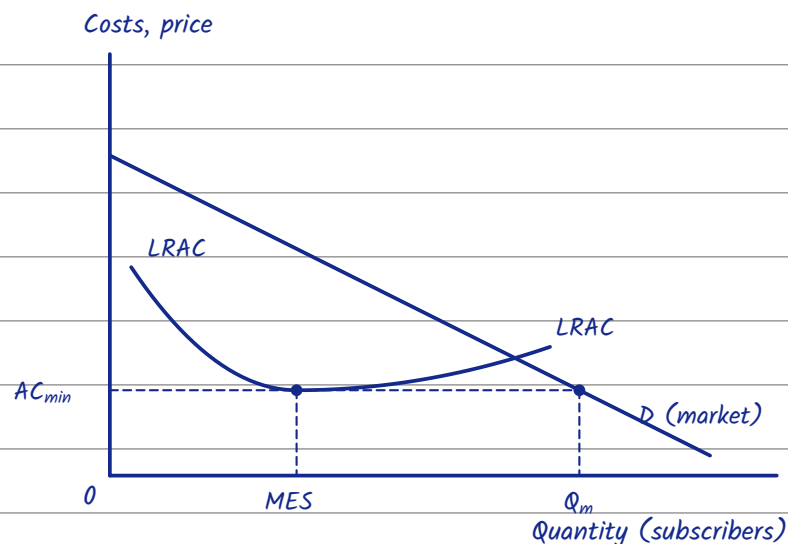
5(c)

An oligopoly is a market dominated by a few large firms, characterised by interdependence, high barriers to entry, differentiated products and a tendency towards non-price competition or collusion. A natural oligopoly occurs when maximum efficiency (lowest average cost) is achieved with only a small number of suppliers rather than many competing ones. This happens where fixed costs are so high, and economies of scale so large, that the minimum efficient scale (MES), the lowest output at which LRAC is minimised, is a large proportion of total market demand.

There is strong evidence that the UK mobile market fits this description.

Building and maintaining a network capable of delivering 4G to the whole UK involves huge fixed and largely sunk costs (masts, spectrum licences, backhaul).

Once the network exists, the marginal cost of an extra subscriber is very low, so average cost falls continuously as fixed costs are spread over more customers. The diagram below illustrates this.



As the diagram shows, MES is reached at a very high output. If the market price fell to the minimum of LRAC, total market demand  $Q_m$  would be only about two and a half times MES, so only two or three firms could produce at lowest average cost. This is exactly the argument of Joseph Daly in Source 2, that 'the industry can only accommodate two or three big players' and that high-tech industries 'naturally tend towards oligopoly'. Fig. 2 supports this: only four firms (EE, O2, Three and Vodafone) own physical networks and between them hold 82% of revenue and 93% of subscribers. The other twenty-six firms are virtual operators which cannot afford their own infrastructure and must rent capacity at wholesale prices. Three and O2 also claimed that only consolidation would give the scale needed to fund 3G and 4G roll-out.

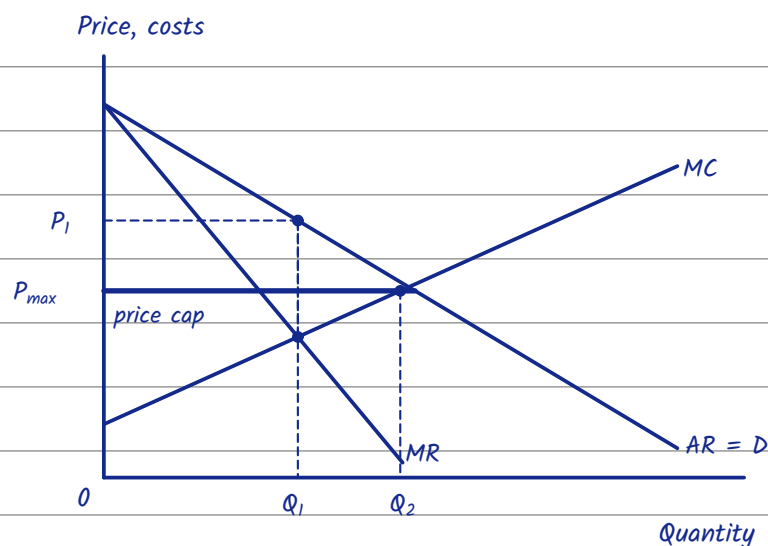
However, there are reasons to question this. First, the market is not purely 'natural': spectrum is allocated by government licence, so part of the barrier to entry is regulatory rather than a result of cost conditions. Second, the EU competition authorities clearly judged that the UK market is large enough for four network operators to survive and achieve efficiency, so the evidence suggests a natural limit of about four firms rather than two or three. Third, the market performs better than a typical oligopoly: Source 1 describes intense competition between thirty providers and Fig. 1 shows UK prices are the lowest of the six countries, around £35 a month against £62 in the USA. This

suggests the virtual operators make the retail market fairly contestable even though network ownership is concentrated. Finally, firms may simply be claiming economies of scale to justify mergers that really aim to increase market power. In conclusion, the network (wholesale) level of the UK mobile market can reasonably be described as a natural oligopoly because huge fixed costs and a high MES limit efficient operation to a few firms. The extent depends on how many firms MES actually allows; the evidence points to around four rather than the two or three claimed, and at the retail level competition from virtual operators means the market behaves less like an oligopoly than its structure suggests.

5(d)

A market functions well for consumers when it delivers low prices, good quality and coverage, innovation, good customer service, wide choice and contracts that make switching easy. Having blocked the O2/Three merger, regulators such as Ofcom and the CMA have several alternative tools, as Tom Ridgeway notes in Source 3.

First, price regulation. The regulator could cap prices using an  $RPI - X$  formula, where prices may rise each year by inflation minus an efficiency factor  $X$ . This protects consumers from monopoly pricing while still allowing firms to keep any cost savings beyond  $X$ , giving an incentive to be efficient. The diagram shows a price cap imposed on a network operator.



Unregulated, the firm maximises profit where  $MC = MR$ , at  $P_1$  and  $Q_1$ . A cap at  $P_{max}$  makes the AR curve horizontal at  $P_{max}$  up to the demand curve, so  $P_{max}$  is also MR; the firm now produces  $Q_2$  where  $MC = P_{max}$ . Price falls and output rises, reducing allocative inefficiency. However, setting  $X$  is very difficult because of asymmetric information: firms know their costs better than the regulator. If  $X$  is too high, profits may be too low to fund 4G and 5G investment; if too low, firms earn supernormal profit. There is also a risk of regulatory capture, where the regulator comes to serve the industry's interests.

Second, the regulator could allow the merger subject to behavioural or structural remedies, as Ridgeway suggests. Conditions could require the combined firm to sell network capacity to virtual operators at regulated wholesale prices, or to divest spectrum or customers to a new entrant. This gains the scale economies while preserving competition in the retail market. The weakness is that such remedies are costly to monitor, and the firm has an incentive to give rivals worse service.

Third, the authorities could reduce barriers to entry and increase contestability, for example by auctioning spectrum with portions reserved for smaller operators, requiring mast sharing, or making switching easier (text-to-switch, limits on contract length and exit fees). This tackles the cause of market power and increases competitive pressure, but entrants still face very high sunk costs, so

its effect may be slow and limited.

Fourth, other options include quality regulation (minimum coverage obligations attached to licences), windfall taxes on supernormal profits, subsidising rivals or rural coverage, nationalising the network or breaking up the largest firm.

Windfall taxes and break-ups deter investment and are likely to face legal challenge, while subsidies carry an opportunity cost for taxpayers. Nationalisation removes the profit motive and may reduce efficiency and innovation, so these are unlikely to be appropriate in a market where prices are already low.

All of these measures involve administration costs, and the risk of government failure. Which is best depends on the problem: price caps suit a market with entrenched market power, while access regulation and lower barriers to entry suit a market which already has competitive retail prices. As Fig. 1 shows UK prices are already the lowest of the six countries, the most suitable approach is probably light-touch regulation that keeps the market contestable, combining wholesale access rules, easier switching and coverage obligations, rather than heavy price controls which could damage the investment the industry needs.

7

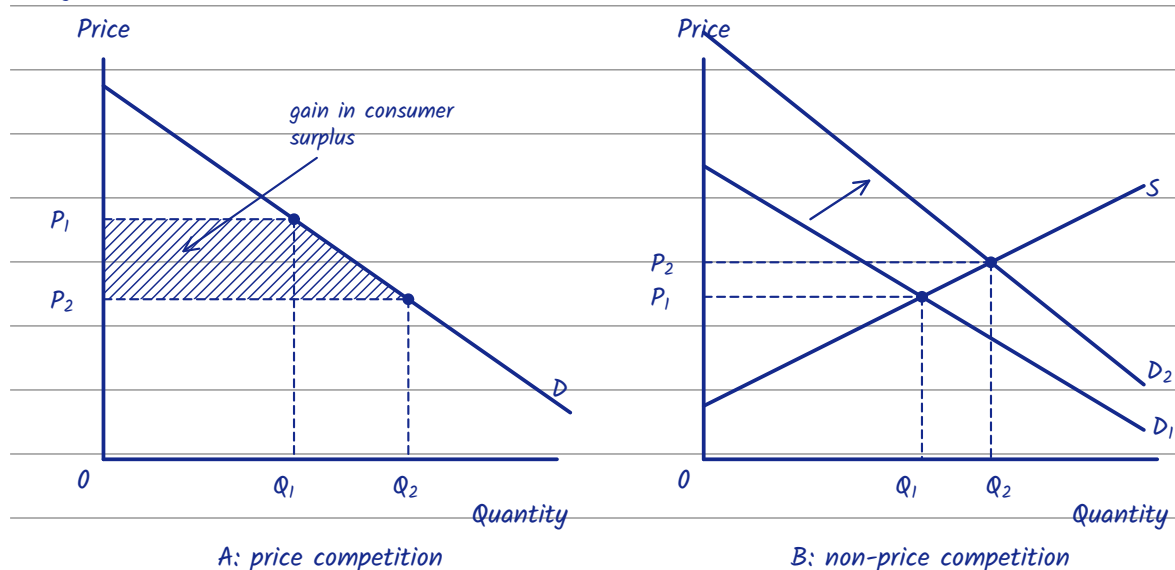
Price competition occurs when firms try to win customers by lowering prices relative to rivals, through price cuts, discounts, price matching or price wars.

Non-price competition occurs when firms compete through anything other than price: advertising and branding, product quality, store design, customer service, loyalty cards and product differentiation. Lidl's planned move from a high-volume discounter to a mainstream supermarket, with store expansion, merchandising, advertising and loyalty cards, is a shift from price to non-price competition.

Traditional theory suggests consumers benefit most from price competition.

Lower prices increase consumer surplus and raise consumers' real incomes, as shown in diagram A below. Firms forced to compete on price must also cut costs, which improves productive efficiency and moves price closer to marginal cost, improving allocative efficiency. The growth of Aldi and Lidl as discounters forced Tesco, Asda and Sainsbury's into price matching and lower prices in the

UK grocery market, which particularly helps low income households who spend a large share of income on food.



In diagram A a fall in price from  $P_1$  to  $P_2$  raises quantity from  $Q_1$  to  $Q_2$  and increases consumer surplus by the hatched area. In diagram B advertising and branding shift demand from  $D_1$  to  $D_2$  and make it more price inelastic as brand loyalty grows, so the price rises from  $P_1$  to  $P_2$ . This is the critics' point: non-price competition raises costs, and if it also reduces the price elasticity of demand, firms can pass those costs on, so UK consumers may face higher prices at Lidl.

However, price competition is not always good for consumers in the long run. In oligopolistic markets such as supermarkets the kinked demand curve model suggests price cuts will be matched, so a price war simply reduces all firms' revenue. Intense price competition may force smaller or less efficient firms out of the industry, as with smaller grocery chains, reducing competition and choice; the survivors may then raise prices. Large firms may even use predatory pricing, setting price below average cost to drive out rivals before raising prices.

Constant price cutting may also reduce quality, for example through cheaper ingredients, lower wages or fewer staff, and squeezes suppliers such as farmers.

Retained profit to fund investment and innovation falls too.

Supporters of non-price competition argue that it brings real benefits. It

encourages firms to improve product quality and customer service, which raise consumer welfare even if prices do not fall. It leads to greater product variety, since firms differentiate their goods to stand out, giving consumers more choice. Informative advertising improves consumers' knowledge of products, prices and new stores, reducing search costs and making markets more competitive and efficient. Loyalty cards effectively return a discount to regular shoppers.

Non-price competition also tends to bring price stability, which allows households to plan their spending. For Lidl, larger stores and a wider range would allow consumers to do a one-stop shop, saving time and travel costs. On the other hand, non-price competition has costs. Advertising and branding are expensive, and in the long run these costs are included in prices. Much advertising is persuasive rather than informative, designed to manipulate consumer tastes and create artificial brand loyalty rather than provide useful information. Heavy advertising and loyalty schemes can act as barriers to entry, since new firms must match the spending of incumbents, which protects supernormal profit. Product differentiation may also create confusing choice and give firms some monopoly power. In monopolistic competition, firms operate with excess capacity in the long run, not at minimum average cost, so non-price competition can coexist with productive inefficiency. Loyalty cards also allow firms to collect data and price discriminate.

Which form of competition benefits consumers more depends on several factors. First, the type of non-price competition matters: genuine improvements in quality, service and information benefit consumers, whereas purely persuasive advertising mostly benefits firms. Second, the time period matters: price competition gives immediate gains, but if it drives out rivals the long-run effect may be negative, whereas non-price investment in quality pays off over time. Third, market structure matters: in a contestable market with low barriers, non-price competition cannot sustain high prices, because entrants such as Aldi would undercut them, while in a concentrated market it may lead to tacit collusion on price. Fourth, consumers differ: price-sensitive, low income

households gain most from price competition, while higher income consumers value quality and convenience and may happily pay more.

In conclusion, neither form of competition is always better. Price competition delivers the clearest and most direct gains through lower prices and higher real incomes, but if it becomes predatory or destroys competition consumers lose in the long run. Non-price competition can raise quality, choice and information, but persuasive advertising and barriers to entry may raise prices, as critics of Lidl fear. The best outcome for consumers is a market where both forms coexist: Lidl's repositioning is likely to benefit consumers on balance as long as the UK grocery market remains contestable, with Aldi and others continuing to compete on price, so that any rise in Lidl's prices is limited by competition and is matched by genuine improvements in quality and choice.