

EGT2
ENGINEERING TRIPOS PART IIA

Thursday 5 May 2022 2 to 3.40

Module 3E1

BUSINESS ECONOMICS

*Answer not more than **two** questions.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

*Write your candidate number **not** your name on the cover sheet.*

STATIONERY REQUIREMENTS

Single-sided script paper

SPECIAL REQUIREMENTS TO BE SUPPLIED FOR THIS EXAM

CUED approved calculator allowed

10 minutes reading time is allowed for this paper at the start of the exam.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed to do so.

You may not remove any stationery from the Examination Room.

1 The following is based on excerpts from “*Is Ticketmaster a monopoly?*”, The Economist, Nov 9, 2022]. November 18th should have been a momentous day for Taylor Swift’s fans. Tickets for the American leg of the pop star’s tour next year—her first since 2018—were due to be released to the public on Ticketmaster, an online ticket vendor. But on November 17th the company abruptly cancelled the sale, saying it had too few tickets left and problems with its ticketing system after a botched early release on November 15th. Ticketmaster had invited fans to register for the pre-release and verified those who could take part. This was an attempt to crack down on bots and ticket touts and to manage high demand. But the sale was plagued with glitches and delays. The firm said over 2m tickets were sold—but many soon appeared on resale sites for eye-watering sums.

The bad blood extends beyond the ranks of infuriated Swifties (as Ms Swift’s vociferous fans are known). The pop star herself expressed frustration with Ticketmaster on social media. Jonathan Skrmetti, the Republican attorney-general of Tennessee, a state with a huge music industry, said he would look into the pre-release fiasco. Amy Klobuchar, the Democratic chair of the Senate antitrust subcommittee, said Congress would hold a hearing on Ticketmaster before the end of the year. The New York Times reported that in recent months America’s Department of Justice (DOJ) has been investigating whether Live Nation Entertainment, Ticketmaster’s parent company, is a monopoly.

(a) What factors should the antitrust authority consider in deciding whether Live Nation Entertainment is a monopoly? What could the government do to mitigate the consequences to society if Live Nation Entertainment is found to be a monopoly? [40%]

Discuss the characteristics of a monopoly. Relevant market definition. Measures of concentration (HHI, CRn, LI) relate to demand elasticity, barriers to entry. Discuss the inefficiency associated with Monopoly and possible solutions may include regulation such as price ceiling, reducing barriers to entry and increasing competition. Caveats in the solutions.

(b) Suppose that there are two groups of fans. The demand for the first group of fans is given by $P = 200 - Q$ and the demand for the second group is given by $P = 200 - 2Q$. Marginal cost is equal to £40. Find the profit maximizing price, quantities sold to each group when the firm is not allowed to price discriminate and when it is allowed to do so. Explain how price discrimination affects total surplus? [60%]

Under no price discrimination monopolist charges a uniform price.

Aggregate demand is:

$$Q_1 = 200 - P$$

$$Q_2 = 100 - P/2$$

$$Q = 300 - 3P/2, P \leq 200$$

Inverse demand

$$P = 200 - 2Q/3, Q \geq 0$$

Setting marginal revenue equal to marginal cost:

$$200 - 4Q/3 = 40$$

$$\text{We find } Q = 120 \text{ and } P = 120$$

$$\text{Profit: } (120 - 40) * 120 = 9600.$$

$$DWL = (120 - 40) * (240 - 120) / 2 = 4800$$

Under third degree price discrimination, monopolist sets MR=MC for each group

$$\text{Group 1: } P = 200 - Q$$

$$MR = 200 - 2Q = MC = 40$$

$$Q = 80$$

$$P = 120$$

$$\text{Group 2: } P = 200 - 2Q$$

$$MR = 200 - 4Q = MC = 40$$

$$Q = 40$$

$$P = 120$$

Total quantity offered will be the same.

DWl from group1

$$(160 - 80) * (120 - 40) / 2 = 3200$$

DWl from group2

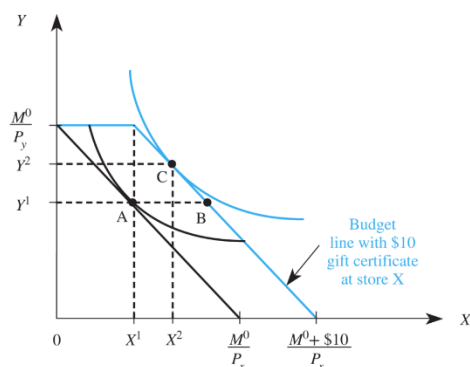
$$(80 - 40) * (120 - 40) / 2 = 1600$$

Third degree and uniform pricing produce the same result. At the optimal point both markets have the same elasticity of the demand and are charges the same price. The firm could also engage in other types of price discrimination, such as two-part tariff, peak loading.

- 2 (a) Gift cards are a popular but some would say impersonalized means of giving gifts to a person. Illustrate the effect of a gift card on consumer choice. In your answer, assume the store does not permit gift cards to be redeemed for cash, i.e., the gift card can only be used in the same store it was purchased. Discuss the benefits for stores in selling gift cards.

[30%]

In this question, a representation of the old and new budget constraint to show the effect of the gift card. The gift card shifts the budget line outwards as shown by the blue curve. With “smooth preferences” the effect of the gift card can be analysed and shown to depend on whether goods are normal or inferior. If X and Y are normal goods, then point C allows a higher indifference curve to be reached. The gift card would have the same impact as a cash gift. If Good X is inferior, the optimal point of consumption will be at the kink. Selling gift cards is beneficial to the store as it reduces the strain on the refund department. This is true for both normal and inferior goods. Second, if the store sells an inferior good, the gift card results in more being sold than if customers resort to giving cash gifts.



(b) An urban rapid-transit line runs full trains (200 passengers per car) at rush hours, but nearly empty trains (10 passengers per car) at off-peak hours. The cost of running a car for one trip on this line is a fixed cost of £50 regardless of the number of passengers. The company has been instructed to maximize profits but is required to run cars all day. A consultant concludes that the average cost per passenger is about £0.25 at rush hour but rises to £5 in off-peak hours and therefore recommends charging much higher prices during the off-peak period as the cost per passenger is so much higher at that time. State whether you agree or disagree with the consultant’s recommendation and explain your reasoning.

[30%]

Disagree. The consultant believes fixed costs are relevant for determining profit maximizing prices. This is not correct. Profit maximization requires $MR = MC$ in each period. Fixed cost plays no role in the $MR = MC$ formula. (The consultant wants to cover most of each period’s fixed costs from the prices paid by the passengers in that period. That will not maximize profit.) Peak load pricing suggests that the price charged in peak periods is higher than the price charged off-peak, contrary to the consultant’s suggestion. In the peak period the trains are running at capacity. The marginal cost curve is vertical at that output level and the firm should price such that demand is equal to capacity in the peak period. In the off-peak period $MC = 0$ so the firm should price such that $MR = 0$, resulting in a relatively low price.

(c) Discuss why the health insurance market may fail to achieve efficiency and ways to mitigate the problem. [40%]

Answers will define what is meant by market failure and discuss both moral hazard and adverse selection problems in health insurance. Better answers will carefully explain why these information asymmetry sources may lead to inefficiencies and propose ways to mitigate the consequences.

3 (a) An industry initially consists of four firms that operate on a market with demand given by $P = 25 - Q$. There are no fixed costs. Marginal cost is equal to £5 for every firm. Assume that initially the firms engage in Cournot competition. Suppose that if two firms merge, they become a Stackelberg leader, and the other two firms are followers. Show the effects of this merger on prices and profits. Do the two firms have a profit incentive to merge?

Before the merger, the four firms compete a la Cournot. Each firm (i) maximizes profit given the quantities produced by the other competitors (-i).

$$MR = 25 - q_{-i} - 2q_i = MC$$

The best response function for firm i is: $q_i = \frac{20 - q_{-i}}{2}$

By symmetry, in equilibrium $q_1 = q_2 = q_3 = q_4$

Thus,

$$q_i = 4$$

Total quantity in equilibrium is 16.

Price in equilibrium is 9.

*Profit earned by each firm is $(9-5)*4=16$.*

Now consider the merger. It will result in 1 Leader and 2 Followers.

For follower i,

MR = MC leads to:

$$MR = 25 - q_L - q_{-i} - 2q_i = 5 = MC$$

Follower i's best response is

$$q_i = \frac{20 - q_L - q_{-i}}{2}$$

By symmetry, in equilibrium $q_{-i} = q_i$

Thus,

$$q_i = \frac{20 - q_L}{3}$$

Total quantity produced by the followers is

$$Q_F = \frac{40 - 2q_L}{3}$$

Leader: *Max:* $(25 - q_L - Q_F)q_L - 5q_L$ (Substitute the follower's total quantity Q_F into the Leader's maximization problem)

$$q_L = 10$$

$$q_i = 10/3$$

Total equilibrium quantity is $10 + 2(10/3) = 50/3$

$$\text{Price} = 25 - 50/3 = 25/3$$

$$\text{Profit Leader: } (25/3 - 5) * 10 = 100/3$$

$$\text{Profit to each follower: } (25/3 - 5) * 10/3 = 100/9.$$

The merger causes the price to decrease from 9 to 25/3.

Post merger profit = $100/3 > 32 = \text{Pre-merger profit}$. Merger is profitable.

(b) Using the concepts learned along the course, discuss the following quote
“There are only two possible ways to win in a market – through cost or differentiation.”
[50%]

This is an open question that allows answers in multiple directions. One way to approach this question would be to compare commodity sellers in perfect competition settings and show a supply curve with different costs versus a market structure where differentiation allows for higher price markups. Answers could approach monopolistic competition settings and explain the importance of differentiation in the short-run. An exploration of oligopolistic settings where lower costs shifts the reaction curves and give a firm higher market share. In a monopolistic setting, differentiation allows lower price elasticity and ability to price strategically and increase mark-ups. Best answers would not only explain the different ways cost and differentiation affects relevant economic concepts but also compare the benchmark commodity setting with other market power settings and discuss ways in which these two strategies may give a firm advantages and critically evaluate the claim.

END OF PAPER

Version JKR/2