AUSTRALIAN GRADUATE SCHOOL OF MANAGEMENT

Microeconomic Analysis
SOLUTIONS

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Mid-Term: Friday June 16th , 2000

Answer 2 out of the following 3 questions. *DO NOT ANSWER ALL 3!* Answer in the booklet provided. Each question is worth 10 marks.

QUESTION 1:

In the 1996-97 academic year, annual tuition and fees at Yale University passed the $21,000 level. The university has a special policy whereby children of its faculty who attend Yale are required to pay only fees, which come to approximately $2000/year. The faculty committee on compensation argued for many years that the university should extend the same tuition benefits to faculty children who attend universities other than Yale. The traditional response of the university was that it could not afford to make such an offer. Under prodding by economists on the committee, however, the administration eventually took a tentative step in this direction by offering to pay one-third of tuition and fees at other universities.

Evaluate the effect of such a policy on the costs to Yale (carefully detail the assumptions that underlie your reasoning).

To its surprise, this new policy not only did not cost the university any money, but actually saved a great deal. The reason is that the number of faculty children attending Yale went down significantly once the new policy was in effect. This opened up an equivalent number of new positions in the freshman class, and because most of these were filled by tuition-paying students, Yale came out ahead. Faculty families who received the new financial aid also came out ahead, And so did the new students who would otherwise have been unable to attend Yale. The university had overlooked the opportunity cost of allocating positions to faculty children, and had failed to anticipate that so many of them would be vacated because of the new offer.

QUESTION 2

You are the manager of Vintage Wines Pty. Ltd., a premium wine merchant. Your current task is to maximise the net profits from the sale of 120 bottles of rare wine that you bought for $7 per bottle from the widow of a wine collector. You want to decide how many bottles to allocate between two markets: Sydney and Melbourne. You believe you can sell as many bottles as you have in Melbourne for $100 per bottle. In contrast, while a few people in Sydney are willing to pay high prices for good wine, the Sydney wine market tends to be more price sensitive; you believe that the Sydney demand curve is as follows:

$$Q_D = 140 - P$$

where Q_D is the number of bottles demanded in Sydney and P is the price per bottle charged in Sydney.

The wine bottles are currently in Melbourne and you estimate that transport costs to Sydney would be around $10 per bottle; there are no other significant costs that would be incremental to your decision.

(a) What is the marginal revenue curve in each market?

$$MR^{Melbourne} = Price = \$100$$
$$MR^{Sydney} = 140 - 2Q$$

(b) How much wine should you allocate between the two markets?

In order to ascertain the optimal quantity of wine to allocate in the two markets, note that the marginal profit in each market must be equated. If this were not so, profits could be maximised by an appropriate reallocation of the bottles. Thus,

$$M\Pi^{Melbourne} = MR^{Melbourne} - MC^{Melbourne} = M\Pi^{Sydney} = MR^{Sydney} - MC^{Sydney}$$
$$= 100 - 0 = 140 - 2Q - 10$$

Or, $Q = 15$. Hence we allocate 105 bottles to the Melbourne market and the remaining 15 to Sydney.

(c) What price should you charge in each market? Explain the reasons for the differences in price (if any). Are there any practical limitations on your proposed strategy?

The price in the Melbourne market is given to us at \$100. For the Sydney market, looking at the demand function, we know that we can sell a quantity of 15 bottles at a price of $P = \$125$. The main practical limitation to such a differential pricing strategy is the possibility of arbitrage we discussed in class.

(d) Given your answers above, calculate the net profit that Vintage Wines Pty. Ltd. would earn from the 120 bottles.

The profits Vintage Wines would earn (considering the purchase of the bottles as a sunk investment) are:

$(100 * 105) + (125 * 15) - (10 * 15) = 12225$.

If you included the \$7 paid per bottle for the 120 bottles, the net profit would be

$12225 - (7*120) = 11385$

QUESTION 3:

Suppose that there are ten orthopeadic surgeons that have their private consultation rooms in a shared facility. Currently each earns $20,000 per month and pays $10,000 per month towards the operating expenses of the joint facility. A world renowned radiologist has just moved to town and is deliberating over where to set-up his practice. If he goes it alone he will earn $300,000 per month and will have to incur a monthly operating cost of $100,000. On the other hand, the orthopods have calculated that if they were to accommodate him in their existing facility, the joint operating costs would increase from $100,000 to $120,000 per month, but each individual practice will increase its revenues from $20,000 to $50,000 per month. Moreover, they have convinced the radiologist, that his practice will also increase revenues from patients by $20,000 per month.

(a) Assuming that the 10 orthopods are working together (and understand the principle of added value), what cost sharing scheme should they propose to the radiologist?
(b) Why do you think that "anchor" stores like Myer or David Jones, often receive subsidized rental rates relative to some of the smaller stores in a shopping mall and yet the small store owners don't cry foul?

The added value of the radiologist is:

Total value (with him) - Total value (without him) = (820k - 120k) - (200k -100k)
= 600k

The added value of the group of orthopods is:

Total value (with) - Total value (without them) = (820k - 120k) - (300k -100k)
= 500k

Thus the radiologist has a claim of 100k more than the orthopods. Given that the total pie to divide up here is 700k, the radiologist claims the first 100k, and then they divide the remaining 600k equally. Thus the profits of the radiologist are 400k. This means that on top of his 320k revenues from patients he should be offered 80k by the orthopods each month. This, if you like, is a subsidy payment made to the radiologist as his presence brings a lot more business the orthopods way.

As with the example above, the added value of the large stores is often much greater than that of the smaller stores. This means not just that they are in a worse bargaining position, but moreover that it is worth their while to be willing to subsidize the rental rates charged of the anchor stores, as that increases the amount of value that they can also capture. The large stores "pull" customers to the mall, and this in turn helps the small stores.