

## Worked Solution 1

Lectures 1, 2, and 6

| Question | Lecture      |
|----------|--------------|
| 1.       | L1           |
| 2.       | L1           |
| 3.       | L1           |
| 4.       | L1           |
| 5.       | L1           |
| 6.       | L2           |
| 7.       | L6           |
| 8.       | not for exam |
| 9.       | L2           |
| 10.      | L2           |

## Unit 1 solutions

### Exercise 1

What is the opportunity cost of doing the part-time MBA?

#### Answer

You should include not only explicit costs (such as fees, materials costs, etc) but also any implicit opportunity costs (eg, value of forgone alternative use of time).

Benefits might include expected income gains, prestige of degree, consumption benefits of an enjoyable learning experience, etc.

### Exercise 2

1. Are there opportunity costs associated with a firm's use of retained earnings to finance business expansion? How might consideration of such costs by managers improve firm performance? Explain your answers.
2. When do opportunity costs arise from a firm's use of a firm-owned warehouse to store unsold output?

#### Answers

1. As in the Coca Cola case study in the reading, the answer is yes. These retained earnings have an opportunity cost equal to their highest potential alternative return either in the hands of the firm or, if the firm has no attractive investment options, in the hands of shareholders as dividends. In the latter case, the retained earnings would be better distributed to shareholders.

Apart from being wasteful, the use of retained earnings for expansion that yields less than competitive rates of return also depresses the firm's share price, increasing the firm's cost of capital.

2. The use of a warehouse to store output gives rise to opportunity costs when the storage space has alternative uses and when storing and retrieving the output is costly.

### Exercise 3

1. Even though wearing seat belts in cars reduces the risk of a serious accident, many citizens choose not to wear them. Is such behaviour rational? What are the likely effects on accident rates of a legal requirement to wear seatbelts?
2. Is the consumption of narcotic drugs such as heroin irrational? What is likely to be the effect on levels of consumption of such drugs of harm-minimisation policies, such as providing 'safe injecting rooms'?

### Answer

1. If not irrational, then it is unwise not to wear a seatbelt because it does reduce your probability of death in an accident. This is why governments made seatbelt-wearing compulsory. But wearing seatbelts changes people's incentives: they reduce the benefits obtained from slow and careful driving. People respond to seatbelts as they would to improved road conditions: they drive faster and more carelessly. Hence, there are more accidents.

Therefore, the net effect on accident rates of seatbelts is ambiguous: there are fewer deaths per accident but there are more accidents. The net effect on deaths of those wearing belts can go either way. Moreover, there are definitely adverse effects on pedestrians and motorists who do not wear seatbelts! So, if everyone else is wearing one, you definitely should.

Sam Peltzman, an economist, showed in 1975 that auto-safety laws had many of these predicted effects. The laws produce more accidents but fewer risks per accident. (He showed in fact that these effects tend to cancel each other out!)

2. This is debatable and subject to controversy. According to the rational addiction model of Becker and Murphy, addicts can be viewed as maximising their satisfaction from drug use over time subject to various constraints (prices of drugs, probabilities of penalty for drug use, risks of death and disease associated with use). Then a policy such as a 'safe injecting room' while reducing current deaths, by reducing the risks of use will encourage additional use, see Clarke (2001). This is similar to the effect Peltzman noted with respect to seatbelts.

See Becker, G. S. & Murphy K. M. 1988, 'A Theory of Rational Addiction', *Journal of Political Economy*, vol. 96, no. 4, pp. 675–700 and Clarke, H. 2001, 'Some Economics of Safe Injecting Rooms', *The Australian Economic Review*, vol. 34, no. 1, pp. 53–63.

#### Exercise 4

A retail company operating in Sydney and Melbourne undertakes market research to assess the different effects of advertising expenditure on sales in each city. The research yields the following estimated effects of alternative levels of annual advertising expenditure in each city on annual sales.

| Expenditure(\$) | Total Sales (units) |           |
|-----------------|---------------------|-----------|
|                 | Sydney              | Melbourne |
| 0               | 0                   | 0         |
| 10,000          | 60                  | 35        |
| 20,000          | 111                 | 68        |
| 30,000          | 145                 | 100       |
| 40,000          | 174                 | 130       |
| 50,000          | 194                 | 158       |
| 60,000          | 204                 | 183       |
| 70,000          | 210                 | 203       |
| 80,000          | 215                 | 213       |
| 90,000          | 218                 | 217       |
| 100,000         | 220                 | 218       |

The firm has a total advertising budget of \$90,000. What mix of expenditure between the two cities will maximise the company's sales? (Hint: Examine the effect of each successive \$10,000 increase in expenditure – marginal expenditure – on each city's sales.)

#### Answer

The first \$10,000 spent would increase sales by 60 units if spent in City A, or by 35 units if spent in City B. Therefore, the first \$10,000 should be spent in City A.

Having spent \$10,000 in City A, the next \$10,000 would increase sales by 51 units if spent in City A, or by 35 units if spent in City B. Therefore, the second \$10,000 should be spent in City A.

Having spent \$20,000 in City A, the next \$10,000 would increase sales by 34 units if spent in City A, or by 35 units if spent in City B. Therefore, the third \$10,000 should be spent in City B.

Having spent \$20,000 in City A and \$10,000 in City B, the next \$10,000 would increase sales by 34 units if spent in City A, or by 33 units if spent in City B. Therefore, the fourth \$10,000 should be spent in City A.

Having spent \$30,000 in City A and \$10,000 in City B, the next \$10,000 would increase sales by 29 units if spent in City A, or by 33 units if spent in City B. Therefore, the fifth \$10,000 should be spent in City B.

Having spent \$30,000 in City A and \$20,000 in City B, the next \$10,000 would increase sales by 29 units if spent in City A, or by 32 units if spent in City B. Therefore, the sixth \$10,000 should be spent in City B.

Having spent \$30,000 in City A and \$30,000 in City B, the next \$10,000 would increase sales by 29 units if spent in City A, or by 30 units if spent in City B. Therefore, the seventh \$10,000 should be spent in City B.

Having spent \$30,000 in City A and \$40,000 in City B, the next \$10,000 would increase sales by 29 units if spent in City A, or by 28 units if spent in City B. Therefore, the eighth \$10,000 should be spent in City A.

Having spent \$40,000 in City A and \$40,000 in City B, the next \$10,000 would increase sales by 20 units if spent in City A, or by 28 units if spent in City B. Therefore, the ninth \$10,000 should be spent in City B.

Therefore, the optimal allocation of \$90,000 is to spend \$40,000 in City A and \$50,000 in City B.

## Exercise 5

What are the main markets you operate in as a consumer-resource supplier? What are the main markets your firm or organisation operates in as a purchaser of inputs and as a supplier of productive outputs? What transactions costs are incurred in operating in these markets?

### Answers

As a consumer-resource supplier, you purchase goods and services in final product markets and supply factors of production such as labour, land and capital in resource markets (labour markets, land markets and capital markets respectively). Among the transaction costs incurred are search costs.

Firms sell goods and services in final product markets and in markets for intermediate goods. They buy factors of production in labour, land and capital markets. They also experience search costs.

## Exercise 6

Classify each of the following statements as either 'positive' or 'normative'.

|   | Positive | Normative |
|---|----------|-----------|
| People on higher incomes should pay a higher proportion of their income in tax than people on low incomes |          |           |
| A rise in interest rates will discourage business investment expenditure                                  |          |           |
| A cut in wage levels for young people should reduce youth unemployment                                    |          |           |
| Privatisation of government services will improve the efficiency of supply of these services              |          |           |
| Unemployment benefits should be dependent on recipients undertaking some form of community service        |          |           |
| A universal government health insurance scheme denies consumers any choice and is therefore undesirable.  |          |           |

## Answers

Positive statements are capable of refutation on the basis of evidence.

Normative statements are not refutable on the basis of evidence since they are expressions of subjective values. The answers are in sequence:

- Normative
- Positive
- Positive
- Positive
- Normative
- Normative

The judgment about the efficiency of privatising government services is positive, given standard definitions of efficiency. One would need to check whether output is boosted by privatising.

### Exercise 7

Consider two investment projects, A and B. Project A has high upfront costs of construction and high, but very long-term, financial benefits. Project B has high short-term benefits but very substantial long-term costs of decommissioning. Discuss how the viability of these projects is related to the size of the discount rate used in evaluating them.

#### Answer

A high discount rate will discriminate against project A. The high upfront costs will not be affected by discounting but the very long-term financial benefits will be severely affected in terms of having low present value. Project B will tend to be favoured by heavy discounting since the long-term costs faced will have low present value.

At zero discount rate the comparison switches towards a simple comparison of costs and benefits of each project irrespective of when they occur.

### Exercise 8

Suppose you are to stage an outdoor event. If it does not rain, your profit will be \$55,000. If it rains you will sustain a loss of \$5,000. The Weather Bureau states that the probability of rain is 30%.

What is your expected profit? Is insurance, covering any loss (so that you are never out of pocket at all), worth buying at \$3,000?

#### Answers

Let  $X$  = profit.

Without insurance:

$$E(X) = 0.3 \times (-5,000) + 0.7 \times (55,000) = \$37,000.$$

With insurance:

Cost of insurance = \$3,000 (to be paid irrespective of the resulting weather.

Profit/loss if rain = 0.

Profit if no rain = \$55,000.

$$E(X) = 0.3 \times (0) + 0.7 \times (55,000) - 3,000 = \$35,500.$$

If you are 'risk neutral' (so the variance in possible profit is not of concern to you), then you should not take out insurance.

### **Exercise 9**

Is the Australian economy currently operating at a point on its production possibility frontier or at a point inside the frontier?

#### **Answer**

Australia has around six per cent unemployed. If these unemployed resources could be utilised to provide goods and services, then output of some goods and services could be increased without sacrificing the production of any output. Therefore, Australia must be operating inside its production possibility frontier.

### **Exercise 10**

How should a business manager allocate time between competing tasks?  
How could you tell whether a particular allocation of time was efficient?  
What is an inefficient time allocation?

#### **Answers**

The production possibility frontier idea can be employed. The manager's time is fixed and needs to be assigned to various tasks in terms of their respective priorities.

An efficient allocation of time is one that for given achievement of any task, maximises the attainment of other objectives. This might involve taking breaks and unwinding. An inefficient allocation of time is one where additional effort on a particular task can lead to improved performance without loss in achieving any other tasks. Having selected an efficient set of activities, the manager needs to allocate time on the basis of the priority or value assigned to the various tasks. This type of task is discussed further in Unit 4.