The Institute of Finance Management
Accounting and Finance Department
Tutorial Questions
Decision-Making under an Environment of Uncertainty and Risk

BACC 3 and BAIT 3

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REVIEW QUESTIONS

QUESTION 1

Mr. Bonge, the manager of the ice rink is trying to decide what price per person to charge for a five-week ice skating course that would be held on Saturday mornings. He is considering three possible prices- Shs 2,000, Shs 3,000 or Shs 5,000.

Mr. Bingwa, a local ice skating dancer is competing in an International Competition, and this has increased interest in skating. If Mr Bingwa wins the competition, Mr Bonge believes that demand for the courses will be high. If Mr. Bingwa reaches the finals but does not win the competition, demand will be medium and if Mr. Bingwa does not reach the finals, demand will be low.

A decision on what price to charge has to be taken before the results of the competition are known as the sports complex wishes to start to advertise the course.

Mr. Bonge has provided you with a table showing his estimates of the number of people who would attend the course, based on the price charged and the level of demand:

	Demand (number per person)		
Price charged	High	Medium	Low
2,000	35	35	35
3,000	30	25	20
5,000	20	10	10

REQUIRED:

Determine which price Mr. Bonge should charge for the course based on the following decision making rules. Your answer should include a brief explanation of the meaning of each rule, and what type of risk taker would use it.
 (a) Maximax;
 (b) Maximin;
 (c) Minimax regret.

QUESTION 2

ABC Publishing Company has been formed in order to publish papers during the impending election period. The management believes that campaign for presidential and parliamentary seats will stimulate demand for political information. The issue at stake however, is whether management should publish a daily paper or a weekly paper because the available funds do not allow ABC to produce both papers. The cost accountant has compiled the following comparative data.

	DAILY NEWS	WEEKLY NEWS
Sales price per copy	Shs 6,000	Shs 7,000
Unit variable cost	Shs 5,200	Shs 5,000
Annual fixed cost	Shs 40m	Shs 124m

The marketing department has also compiled the following information about demand for two papers

DAILY NEWS			WEEKLY NEWS		
States of Nature	Probability	Demand	state of nature	Probability	Demand
Stiff	0.25	60,000	stiff	0.35	40,000
Normal	0.50	80,000	Normal	0.45	74,000
Slack	0.25	100,000	slack	0.20	150,000

REQUIRED

Suggest to the management which of the two papers should be published if it is risk averse. Add brief comments to support your suggestion.

QUESTION 3
Bongo Co sells electronic equipment and is about to launch a new product onto the market. It needs to prepare its budget for the coming year and is trying to decide whether to launch the product at a price of Shs30 or Shs35 per unit. The following information has been obtained from market research:

Price per unit Shs 30		Price per unit Shs 35	
Probability	Sales volume	Probability	Sales volume
0·4	120,000	0·3	108,000
0·5	110,000	0·3	100,000
0·1	140,000	0·4	94,000

Notes
1. Variable production costs would be Shs.12 per unit for production volumes up to and including 100,000 units each year. However, if production exceeds 100,000 units each year, the variable production cost per unit would fall to Shs11 for all units produced.
2. Advertising costs would be Shs 900,000 per annum at a selling price of Shs30 and Shs 970,000 per annum at a price of Shs 35.
3. Fixed production costs would be Shs450,000 per annum

REQUIRED
(a) Calculate each of the six possible profit outcomes which could arise for Bunge Co in the coming year.
(b) Calculate the expected value of profit for each of the two price options and recommend, on this basis, which option Bunge Co would choose
(c) Briefly explain the maximin decision rule and identify which price should be chosen by management if they use this rule to decide which price should be charged
(d) Discuss the factors which may give rise to uncertainty when setting budgets

QUESTION 4

Bunge Gym (BG) is a health club. It currently has 6,000 members, with each member paying a subscription fee of Shs 720 per annum. The club is comprised of a gym, a swimming pool and a small exercise studio. A competitor company is opening a new gym in BG's local area, and this is expected to cause a fall in BG's membership numbers, unless BG can improve its own facilities. Consequently, BG is considering whether or not to expand its exercise studio in a hope to improve its membership numbers. Any improvements are expected to last for three years.

Option 1

No expansion. In this case, membership numbers would be expected to fall to 5,250 per annum for the next three years. Operational costs would stay at their current level of Shs 80 per member per annum.

Option 2

Expand the exercise studio. The capital cost of this would be Shs 360,000.The expected effect on membership numbers for the next three years is as follows:

Probability	Effect on membership numbers
0·4	Remain at their current level of 6,000 members per annum
0·6	Increase to 6,500 members per annum

The effect on operational costs for the next three years is expected to be:

Probability	Effect on operational costs
0·5	Increase to Shs120 per member per annum
0·5	Increase to Shs180 per member per annum

REQUIRED:
(a) Using the criterion of expected value, prepare and fully label a decision tree that shows the two options available to BG. Recommend the decision that BG should make. Note: Ignore time value of money.
(b) Calculate the maximum price that GB should pay for perfect information about the expansion's exact effect on MEMBERSHIP NUMBERS.
(c) Briefly discuss the problems of using expected values for decisions of this nature**.**

QUESTION 5

Bunge Ltd is a company which engages in site clearance and site preparation work. Information concerning its operations is as follows:
(a) It is company policy to hire all plant and machinery required for the implementation of all orders obtained, rather than to purchase its own plant and machinery.
(b) Bunge Ltd will enter into an advance hire agreement contract for the coming year at one of three levels high, medium or low, which correspond to the requirements of a high, medium or low level of orders obtained.
(c) The level of orders obtained will not be known when the advance hire agreement contract is entered into. A set of probabilities have been estimated by management as to the likelihood of the orders being at a high, medium or low level.
(d) Where the advance hire agreement entered into is lower than that required for the level of orders actually obtained, a premium rate must be paid to obtain the additional plant and machinery required.
(e) No refund is obtainable where the advance hires agreement for plant and machinery is at a level in excess of that required to satisfy the site clearance and preparation orders actually obtained.

A summary of the information relating to the above points is as follows:

Level of orders	Turn over Shs000	Probability	Plant and Machinery hire cost	
			Advance hire Shs000	Conversion Premium Shs000
High	15,000	0.25	2,300	
Medium	8,500	0.45	1,500	
Low	4,000	0.3	1,000	
Low to medium				850
Medium to high				1,350
Low to high				2,150
Variable cost (as percentage of turnover) 70				

REQUIRED
(a) Prepare a summary which shows the forecast net margin earned by Bunge Ltd for the coming year for each possible outcome.
(b) On the basis of maximising expected value, advise Bunge whether the advance contract for the hire of plant and machinery should be at the low, medium or high level.
(c) Explain how the risk preferences of the management members responsible for the choice of advance plant and machinery hire contract may alter the decision reached in (b) above

QUESTION 6

Bunge Heath Centre specializes in the provision of sort/exercise and medical/dietary advice to clients. The service is provided on residential basis and clients stay for whatever number of days suits their needs.

Budgeted estimates for the year ending 30th June 2014 were as follows:

(a)   The maximum capacity of the centre was 50 clients per day for 350 days in the year.
(b)   Clients were invoiced at a fee per day. The budgeted occupancy level varied with the client fee level per day and was estimated at different percentages of maximum capacity as follows:

Client fee per day	Occupancy level	Occupancy as Percentage of maximum capacity
Shs180	High	90%
Shs200	Most likely	75%
Shs220	Low	60%

(c)   Variable costs were also estimated at one of three levels per client day. The high, most likely and low levels per client are Shs95, Shs85 and Shs70, respectively. The range of cost levels reflects only the possible effect of the purchase price of goods and services.

REQUIRED:
(a) Prepare a summary which shows budgeted contribution earned by Bunge Health Centre for the year ended 30th June 2019 for each possible outcome.
(b) State the client fee strategy for the year to 30th June 2019 which resulted from the use of each of the following decision rules. *(Use your answer on (a) above as relevant input and show any additional workings or calculations as necessary).*
    (i)   Maxi maxi
    (ii)   Maximin
    (iii)   Minimax regret
(c) The probabilities of variable cost levels occurring at the high, most likely and low levels provided in the question are estimated as 0.1, 0.6 and 0.3, respectively. Using information available, determine the client fee strategy which will be chosen where maximization of expected value of contribution is used as the decision bases

QUESTION 7
Your friend Jambo, a ticket agent, wants to benefit from your competencies on performance management to maximise returns from business. He has an arrangement with Dar live hall that holds Bongo flavour music concerts for 60 nights a year whereby he receives discounts per concert as follows:

For purchase of	Receives a discount of
200 tickets	20%
300 tickets	25%
400 tickets	30%

500 tickets	40%

You are able to establish
  (i) Purchase must be made in full hundreds and the average price per ticket is Shs. 3,000

  (ii) Jambo must decide in advance each year the number of tickets he will purchase. If he has any tickets unsold by the afternoon of the concert he must return them to super agent. If the super agent sells any of these, Jambo receives 60% of their price

  (iii)Jambo's sales records for a few years show that for a concert with extremely popular Bongo artists he can be confident of selling 500 tickets, for one with lesser known artists 350 tickets and for one with relatively unknown artists 200 tickets

  (iv)His records also show that 10% of tickets he returns are sold by the super agent

  (v) His administration costs incurred in selling tickets are the same per concert irrespective of the popularity of the artists

The frequencies of concerts are estimated to be

Types of concert	Frequency
With popular artists	45%
With lesser known artists	30%
With unknown artists	25%

REQUIRED:
(a)   Calculate
         (i) The expected demand for tickets per concert
         (ii) The level of his purchase per concert that will give him the largest profit over a long period time
         (iii)The profit per concert that the level of purchase (ii) above will yield
(b)   Advise Jambo on the maximum sum per annum that he should pay to a Bongo flavour entertainment specialist for 100% correct predictions as to the likely success of each concert

QUESTION 8
Bunge Print Ltd is proposing to introduce to the market a new type of laser printer. It has three possible models which reflect speed of printing and available fonts: Basic, Fast and Enhanced. (The model numbers are QP200B, QP500F and QP700E respectively). However, the company has only sufficient capacity to manufacture one of these models. An analysis of the probable market acceptance of each of the three models has been carried out and the resulting profits estimated as follows:-

Model Acceptance		Profit (Millions)	
	Probability		Model type

		QP200B	QP500F	QP700E
Excellent (E)	0.2	60	100	120
Moderate (M)	0.5	40	60	80
Poor (P)	0.3	20	0	(40)

REQUIRED:

(a) Using the maximum expected profit criteria, choose an appropriate model to introduce to the market.

(b) Explain what is meant by the "expected value of perfect information". Calculate its value for this situation

QUESTION 9

ABC Breweries Company Ltd is reviewing the price that it charges for major product line. Over the past three years, the product has had sales averaging 48,000 units per year at a standard selling price of shs525. Costs have been rising steadily over the past year and the company is considering raising this price to shs575 or 625. The sales manager has produced the following schedule to assist with the decision.

Price	shs575	shs625
Estimates of Demand:		
Pessimistic Estimate	35,000	10,000
(Probability 0.25)		
Most Likely Estimate	40,000	20,000
(Probability 0.60)		
Optimistic Estimate	50,000	40,000
(Probability 0.15)		

Currently the unit cost is estimated at shs500 analyzed as follows:

Variable Cost		
Direct Material	Shs 250	
Direct Labour	100	
Overhead	200	450
Fixed Overhead Costs		50
Total Estimated per unit cost		500

The cost accountant considers that the most likely value for unit variable cost over the next year, is shs490 (subjective probability 0.75) but that it could be as high as shs520 (probability 0.15) and it might even be as low as shs475 (probability 0.10). Total fixed costs are currently shs 2,400,000,000 p.a. but it is estimated that the corresponding total for the ensuring year will be:

Shs 2,500,000 with a probability of 0.2
Shs 2,700,000 with a probability of 0.6
Shs 3,000,000 with a probability of 0.2

(Demand quantities, unit costs and fixed costs can be assumed to be statistically independent).

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REQUIRED:
Analyze the foregoing information in a way you think will assist management with the pricing problem and advise on the new selling price. Calculate the expected level of profit that would follow from the selling price that you recommend.