

16 – Limiting Factor Analysis

Limiting Factor

Limiting factor is any factor that limits organizational activity. Every commercial business aims for profit maximization but its aim is restricted by some factors such as **availability of raw material** for production, **availability of labor hours**, **availability of machine hours**, **shortage of factory space**, **finance** etc. In Limiting factor analysis we need to identify that limiting factor and make an optimal production plan. Optimal plan is a production plan that maximizes overall company profitability.

Contribution = Sales – All Variable Costs

Contribution towards covering fixed costs and making profit

Product	A	B	C
Selling price / unit	XXX	XXX	XXX
Less: Variable Cost / Unit			
Direct Material	X	X	X
Direct Labor	X	X	X
Direct Exp	X	X	X
Variable OH	X	(XX)	(XX)
Contribution / Unit	XX	XX	XX
Divide by			
Kgs / Hrs per unit	X	X	X
Contribution per unit of kg / hr	XX	XX	XX
Ranking	3	1	2

Optimal Production Plan and profit statement (in class)

Reducing the effect of limiting factors in long term

1. Shortage of Raw Material

- (a) Search for new source of raw material
- (b) Reduce the dependency on particular material or component by re-designing / re-engineering

2. Shortage of Skilled Labour

- (a) Attract more skilled labour by advertising and incentives such as increased pay, paying for moving costs etc

3. Shortage of production capacity e.g. machinery, machine hours

- (a) purchase of additional production machinery
- (b) sub-contract some work to outside companies

4. Shortage of factory space

- (a) increase factory space by building an extension
- (b) purchasing / Hiring an additional factory
- (c) sub-contract some work to outside companies

5. Lack of Demand for a particular product

- (a) increase sales levels by changing prices
- (b) advertising campaigns or giving sales incentives to staff / customers

6. Shortage of finance

- (a) Additional investment by owners / share holders
- (b) loans from bank or other sources

16 - Marginal Costing and Limiting Factors

- Q1. Passabuck Ltd makes three products: meenibuck, teenibuck and deluxibuk for which the following details are given:

Product	Meenibuck	Teenibuck	Deluxibuk
Direct material (kilos per unit)	5	7	10
Direct labour (hours per unit)	4	6	8
Direct expenses (per unit)	\$7	\$4	\$9
Selling price per unit	\$74	\$85	\$115

Further information:

- 1 All three products are made from material X.
- 2 Material X costs \$3 per kilo.
- 3 All three products require the same type of labour which is paid at \$7 per hour.
- 4 Total fixed costs amount to \$70 000.
- 5 Budgeted production (based upon maximum demand) is:
 Meenibuck 2000 units
 Teenibuck 2400 units
 Deluxibuk 1800 units

It has now been discovered that the supply of material X is limited to 38 000 kilos.

REQUIRED

- (a) Calculate the contribution per kilo of material X used for each product. [12]
- (b) Prepare a production budget based on your calculation in (a) to give maximum profit from the material available. [11]

Q2. Lagrad Ltd manufactures four types of camera which all use "yugaras", a component made only in one factory. Each "yugara" costs \$50 to purchase. Due to a prolonged strike of workers in the "yugara" factory, Lagrad Ltd will only be able to purchase 20 000 this year.

The following information relates to each type of camera manufactured by Lagrad Ltd.

	Digital cameras	Cine cameras	Closed circuit television cameras	Medical cameras
Maximum demand(units)	10 000	4 000	3 000	500
Costs per camera	\$	\$	\$	\$
Yugaras	50	100	200	350
Other direct materials	40	90	98	300
Direct labour	20	30	30	55
Fixed costs	60	80	40	70
Profit per camera	50	70	52	490
Selling price per camera	220	370	420	1 265

REQUIRED

- Calculate the numbers of each type of camera to be produced and sold that would maximise the profit of Lagrad Ltd. [21]
- Prepare a marginal cost statement showing the profit for the year. [9]
- Calculate the **total annual** sales revenue required by Lagrad Ltd to break-even this year. [6]
- Outline **two** disadvantages that might be encountered if the planned production pattern was adopted. [4]

[Total: 40]

- Q3.** Jardiniere Ltd manufactures three types of garden chairs, Alpha, Beta and Gamma, using the same raw materials. The budget for November and December 2011 showed the following details per unit.

	Alpha	Beta	Gamma
	\$	\$	\$
Selling price	58	52	47
Direct labour	12	15	9
Direct materials	21	21	14
Variable overheads	12	10	10
Fixed overheads	3	2	3

REQUIRED

- (a) Calculate the contribution per unit of **each** variety of chair. [8]
- (b) Jardiniere Ltd manufactures 10 000 units of **each** type of chair per month.
Prepare a profit statement which shows the budgeted profit for November. [8]

The cost of material is \$7 per kilo.

Due to festivals and holidays in December only 70% of the total material required will be delivered.

REQUIRED

- (c) Prepare a statement which shows the optimum production plan and maximum profit achievable as a result of the material shortage in December. [14]
- (d) The company has a contract to supply 5000 of **each** type of chair to a major customer. Calculate the loss in total profit for December as a result of satisfying this contract. [10]

[Total: 40]

- Q4.** During May the company had the opportunity to produce a further three products, Alphas, Betas and Deltas. There were insufficient labour hours to meet the production requirements in full. The details were as follows:

	Alphas	Betas	Deltas
Contribution per unit	\$15	\$10	\$12
Labour hours per unit	5	4	3

The maximum demand for each product is 4000 units and there are 40000 labour hours available. The associated fixed costs are \$75 000.

REQUIRED

- (e) Determine the optimum production plan and calculate the associated net profit. [9]

Q5. ABG Ltd manufactures three products, Alpha, Beta and Gamma, all of which are made from one basic raw material.

Forecast costs and selling prices are as follows.

Product	Alpha	Beta	Gamma
Sales per month (units)	9 000	12 000	7 000
	\$	\$	\$
Selling price per unit	72	74	58
Variable costs per unit:			
Direct material	18	25	16
Direct labour	19	14	13
Variable overheads	14	13	12

The total fixed costs are \$250 000 each month.

REQUIRED

- (a) Calculate the contribution per unit for **each** product.
- (b) Calculate the total monthly profit which can be achieved.

Due to a material shortage, ABG Ltd will only receive 80% of its material requirement for the month of April 2013. No other shortages are expected.

REQUIRED

- (c) Using the quantity of material that is available, prepare a statement to show the maximum profit that could be achieved for the three months ended 30 April 2013.
- (d) ABG Ltd has received an enquiry for an additional order of 3000 units of Gamma at a special price of \$50 per unit. Additional fixed costs of \$15 000 would be incurred.

Assuming no material shortage, calculate the profit or loss on this order.

- (e) Identify **three** factors which ABG Ltd should consider when deciding whether to accept this additional order for Gamma.