Marginal analysis is an examination of the additional benefits of an activity compared to the additional costs incurred by that same activity. Companies use marginal analysis as a decision-making tool to help them maximize their potential profits. Marginal refers to the focus on the cost or benefit of the next unit or individual, for example, the cost to produce one more widget or the profit earned by adding one more worker.

Marginal costing is a very valuable *decision-making* technique. It helps management to set prices, compare alternative production methods, set production activity levels, close production lines and choose which of a range of potential products to manufacture. Moreover, the principles of marginal costing can be easily applied to straightforward problems, and although there are some difficulties and limitations to marginal costing, it is nevertheless a very useful technique.

Most of the microeconomic theory of marginalism was developed by Cambridge University professor and economist Alfred Marshall. He stated that production is only beneficial for a firm when marginal revenue exceeds marginal cost, and it is most beneficial when the difference is largest.

For instance, a toy manufacturer should only produce toys until marginal expense is equal to marginal benefit. By breaking down decisions into measurable, smaller pieces, the toy manager can optimize profits.

Marginal analysis has applicability well outside the range of for-profit production processes. Every resource allocation decision can benefit from marginal analysis as long as costs and benefits are identifiable.

Illustration 2.3(M): Two companies A Ltd. and B Ltd. sell the same type of product in the same market. Their budgeted profit and loss accounts for the year ended 31st March, 2014 are as follows:

	ALtd.		***BLtd.***	
	₹		₹	
Budgeted Sales		15,00,000		15,00,000
Less : Variable Cost	12,00,000		10,00,000	
Fixed Cost	1,50,000	13,50,000	3,50,000	13,50,000
Budgeted Profit		**1,50,000**		**1,50,000**

You are required to :

(a) Calculate B.E.P. of each company.

(b) Calculate the slaes volume at which each company will earn a profit of ₹ 50,000;

(c) State which company is likely to earn greater profit in condition of :

(i) heavy demand for the product ;

(ii) low demand for the product.

Solution : **Comperative Statement**

Particulars	***A Ltd.***	***B Ltd.***
	₹	₹
Sales	15,00,000	15,00,000
Less : Variable Cost	12,00,000	10,00,000
Contribution	3,00,000	5,00,000
$\text{P/V Ratio} = \left(\frac{\text{Contribution}}{\text{Sales}} \times 100\right)$	$\frac{3,00,000}{15,00,000} \times 100$	$\frac{5,00,000}{15,00,000} \times 100$
	$= 20\%$	$= 33\frac{1}{3}\%$
(a) $\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$	$\frac{₹\ 1,50,000}{\frac{20}{100}}$	$\frac{₹\ 3,50,000}{\frac{100}{300}}$
	= ₹ 7,50,000	₹ 10,50,000
(b) Desired Sales $= \frac{\text{Fixed Cost + Required Profit}}{\text{P/V Ratio}}$	$\frac{₹\ (1,50,000 + 50,000)}{\frac{20}{100}}$	$\frac{₹\ (3,50,000 + 50,000)}{\frac{100}{300}}$
	= ₹ 10,00,000	= ₹ 12,00,000

(c) (i) In conditions of heavy deamd, a concern whose P/V ratio is higher can earn greater profit because of greater contribution. So, Y Ltd. is likely to earn greater profit if the demand for the product is high.

(ii) In conditions of low demand, a concern whose break-even point is low can earn greater profit because it starts earning at lower level of sales. So, X Ltd. is likely to earn greater profit if the demand is low.

decision.

Illustration 2.4(M): The following figures are extracted from the records of a manufacturing concern:

	Per unit	
	Product P	**Product Q**
Selling Price (₹)	200	220
Consumption of Materials (kg.)	10	8
Material Cost per kg (₹)	6	5.50
Direct Wages (₹)	7	6
Machine hours used	5	8
Variable Overhead (₹)	8	10

Comment on the profitability of each product when :

(i) Raw material is in short supply.

(ii) Total sales potential in units is limited.

(iii) Total sales potential in value is limited.

(iv) Production capacity in terms of machine hour is limited.

Solution :

Statement showing Comparison of the Contribution and Profitability for the Products :

Particulars	***Per unit***			
	Product P		***Prodcut Q***	
	₹	₹	₹	₹
Selling Price		200		220
Less : Variable Cost :				
Material	60		44	
Wages	7		6	
Variable Overhead	8		10	
		75		60
		125		160
Contribution				
Contribution per k.g. of material		₹12.50		₹ 20
Contribution per rupee of sales		₹0.625		₹ 0.73
Contribution per machine hour		₹ 25		₹ 20

(i) If the raw materials is in short supply, Product Q is better as compared to Product P as its contribution per kg. of material is more than that of P.

(ii) If the sales potential in units is limited, Product Q is better compared to Product P as contribution per unit of Q is more than P.

(iii) If the sales potential in value is limited, Product Q is better than Product P as contribution per rupee of sales of Q is more than P.

(iv) If the production capacity in terms machine hours is limited, Product P is better than Product Q as its contribution per machine hour is more than that of Q.

Illustration 2.5 (M): Following inofmation is available from the cost records of Bengal Engineering Co. Ltd., manufaturing spare parts P and Q :

	P	Q
	₹	₹
Direct Materials per unit	₹ 8	₹ 6
Direct Wages	12 hours @ Re. 0.50 per hour	8 hours @₹ 0.50 per hour
Variable Overhead	150% of Direct Wages	150% of Direct Wages
Selling price	₹ 25	₹ 20

Fixed Overhead (total) ₹ 750

Proposal for sales mixtures :

(a) 250 units of P and 250 units of Q

(b) 500 units of R only

(c) 150 units of P and 350 units of Q

(d) 400 units of Q only

Solution :

Contribution per unit :

From P = ₹ 25 – ₹ (8 + .50 × 12 + 6 × 150%) = ₹ 2

From Q = ₹ 20 – ₹ (6 + .50 × 8 + 4 × 150%) = ₹ 4

Statement showing the Comperative Profitability from different Sales Mix :

Particulars	***Sales Mix (a)***	***Sales Mix (b)***	***Sales Mix (c)***	***Sales Mix (d)***
	₹	₹	₹	₹
Conrtibution :				
From P	500	1,000	300	—
From Q	1,000	—	1,400	1,600
Total Contribution	**1,500**	**1,000**	**1,700**	**1,600**
Less : Fixed Cost	750	750	750	750
	750	250	950	850

5. A company incurs the following expenses to produce 1,000 units of an article :

	₹
Direct materials	60,000
Direct labour	30,000
Power (20% fixed)	20,000
Repairs and maintenance (15% fixed)	16,000
Depreciation (40% variable expenses)	12,000
Administrative Expenses (100% fixed)	24,000

Prepare a flexible budget showing individual expenses of production levels at 1,500 units and 2,00(units.

Solution :

Flexible Budget

For the year/ period

Particulars	***Level of Activity***					
	1,000 units		***1,500 units***		***2,000 units***	
	Per unit	***Total***	***Per unit***	***Total***	***Per unit***	***Total***
		₹		₹		₹
A. Prime cost						
Direct Material	60	60,000	60	90,000	60	1,20,000
Direct Labour	30	30,000	30	45,000	30	60,000
	90	**90,000**	**90**	**1,35,000**	**90**	**1,80,000**
B. Variable Overhead						
Power (80%)	16	16,000	16	24,000	16	32,000
Repairs and Maintenance (85%)	13.60	13,600	13.60	20,400	13.60	27,200
Depreciation (40%)	4.80	4,800	4.80	7,200	4.80	9,600
	34.40	**34,400**	**34.40**	**51,600**	**34.40**	**68,800**
C. Marginal cost (A+B)	124.40	1,24,400	124.40	1,86,600	124.40	2,48,800
D. Fixed cost						
Power (20%)	4.00	4,000	2.67	4,000	2.00	4,000
Repairs and Maintenance (15%)	2.40	2,400	1,60	2,400	1.20	2,400
Depreciation (60%)	7.20	7,200	4.80	7,200	3.60	7,200
Administrative Expenses	24.00	24,000	16.00	24,000	12.00	24,000
	37.60	**37,600**	**25.07**	**37,600**	**18.80**	**37,600**
E. Total Cost (C+D)	162.00	1,62,000	149.47	2,24,200	143.20	2,86,400