

Flexible Budgeting: Practice Questions

Estimation of future levels of activity with any accuracy is extremely difficult in some businesses because of presence of external incontrollable influences. For example, a business which provides luxury goods & services may be very sensitive to changes occurred in the economic climate. Weather may affect some business & prediction of weather conditions is difficult. In such cases, if comparison is done between actual results & budgeted figures, the result may be extremely misleading. It would not be clear without making detailed investigation, for example, whether either because of overspending or merely because the business activity level was above the budgeted level or both, there had arisen a large adverse cost variance. As a result, it becomes really difficult to control & appraisal of performance.

With the preparation of a flexible budget the problem can be solved. Thus, a flexible budget can be defined as a range of budgets which covers a number of different expected levels of activity. It becomes possible to draw up an appropriate 'flexible' budget from the range once actual production is known, also the expenses can be set out which would be appropriate to the achieved level of activity.

The main requirement of a flexible budget is that the analysis of expenses should be done into three distinct categories:

- a. **Fixed expenses**, i.e. irrespective of the levels of activity, these expenses would be remaining the same.
- b. **Variable expenses**, i.e. with the change in levels of activity, these expenses would change in proportion to that level.
- c. **Semi-variable expenses**, i.e. analysis of these expenses into fixed & variable elements are needed to be done.

As already stated, the advantage of flexing a budget is that, for the purposes of control & appraisal of performance, the comparison can be done of the actual performance with the flexed budget.

Illustration1: For the production of 10000 units of a product, the following are the budgeted expenses:

	\$ (per unit)
Direct material	30
Direct Labour	15
Variable overhead	12.50
Fixed overhead (\$ 75000)	7.50
Variable expenses (direct)	2.50
Selling expenses (10% fixed)	7.50
Administration expenses (\$ 25000 rigid for all production levels)	2.50
Distribution expenses (20% fixed)	<u>2.50</u>
Total cost of sale per unit	<u>80.00</u>

Prepare a budget for production of 12000, 14000 & 16000 units showing distinctly marginal cost & total cost.

Solution:

	Flexible Budget			
	<i>Per unit</i>	<i>12000 units</i>	<i>14000 units</i>	<i>16000 units</i>
	\$	\$	\$	\$
Direct Material	30	360000	420000	480000
Direct Labour	15	180000	210000	240000
Direct Variable expenses	2.50	30000	35000	40000

Variable Overhead:

Production	12.50	150000	175000	200000
Selling (Workings 1)	6.75	81000	94500	108000
Distribution (Workings 2)	2.00	24000	28000	32000
<i>Marginal Cost</i>	<u>137.50</u>	<u>825000</u>	<u>962500</u>	<u>1100000</u>
Fixed Production Overhead		75000	75000	75000
Administration Overhead		25000	25000	25000
Selling Overhead (Workings 1)		7500	7500	7500
Distribution Overhead (Workings 2)		5000	5000	5000
<i>Fixed Cost</i>		<u>112500</u>	<u>112500</u>	<u>112500</u>
<i>Total Cost</i>		<u>937500</u>	<u>1075000</u>	<u>1212500</u>
<i>Cost per unit</i>		<u>78.125</u>	<u>76.78</u>	<u>75.78</u>

Workings:

(1) Selling Expenses:

Total for 10000 units is \$ 75000. 10% of this i.e. \$ 7500 is fixed & the balance of \$ 67500 is variable. Hence, variable cost per unit is \$ 6.75.

(2) Distribution expenses:

Total for 10000 units is \$ 25000. 20% of this i.e. \$ 5000 is fixed & the balance of \$ 20000 is variable. Hence, variable cost per unit is \$ 2.

Illustration 2: At a capacity level of 2500 units for article P, the cost per unit is \$ 7.50. The details are given under A below.

	A	B
Material cost	\$ 70000	100% varying
Labour cost	\$ 30000	100% varying
Power	\$ 4000	80% varying
Repairs	\$ 6000	75% varying
Stores	\$ 2000	100% varying
Inspection	\$ 1200	20% varying
Depreciation	\$ 20000	100% fixed
Administration overhead	\$ 10800	20% varying
Selling overhead	<u>\$ 6000</u>	50% varying
	<u>\$ 150000</u>	

Calculate the cost per unit of the product, showing at production levels of 2000 units & 3000 units, the individual expenses.

Solution:

Flexible Budget

	<i>Per unit</i>	<i>2000 units</i>	<i>2500 units</i>	<i>3000 units</i>
	\$	\$	\$	\$
<i>Production</i>				
Variable Cost:				
Material	28.00	56000	70000	84000
Labour	12.00	24000	30000	36000
Stores	0.80	1600	2000	2400
Power (Workings 1)	1.28	2560	3200	3840
Repairs (Workings 2)	1.80	3600	4500	5400
Inspection (Workings 3)	0.096	192	240	288
Administration Overhead (Workings 4)	0.864	1728	2160	2592
Selling Overhead (Workings 5)	<u>1.20</u>	<u>2400</u>	<u>3000</u>	<u>3600</u>
<i>Total Variable Cost (a)</i>	<u>46.04</u>	<u>92080</u>	<u>115100</u>	<u>138120</u>
Fixed Cost:				
Depreciation		20000	20000	20000
Power (Workings 1)		800	800	800
Repairs (Workings 2)		1500	1500	1500
Inspection (Workings 3)		960	960	960
Administration Overhead (Workings 4)		8640	8640	8640
Selling Overhead (Workings 5)		<u>3000</u>	<u>3000</u>	<u>3000</u>
<i>Total Fixed Cost (b)</i>		<u>34900</u>	<u>34900</u>	<u>34900</u>
<i>Total Cost (a +b)</i>		<u>126980</u>	<u>150000</u>	<u>173020</u>
Cost per unit		<u>63.49</u>	<u>60.00</u>	<u>57.673</u>

Workings:

(1) Power:

Total for 2500 units is 4000. 80% of this i.e. \$ 3200 is variable & the balance 20%, i.e. \$ 800 is fixed. Variable cost per unit is \$ 1.28.

(2) Repairs:

Total for 2500 units is 6000. 75% of this i.e. \$ 4500 is variable & the balance 25%, i.e. \$ 1500 is fixed. Variable cost per unit is \$ 1.80.

(3) Inspection:

Total for 2500 units is 1200. 20% of this i.e. \$ 240 is variable & the balance 80%, i.e. \$ 960 is

fixed. Variable cost per unit is \$ 0.096.

(4) Administration Overhead:

Total for 2500 units is 10800. 20% of this i.e. \$ 2160 is variable & the balance 80%, i.e. \$ 8640 is fixed. Variable cost per unit is \$ 0.864.

(5) Selling Overhead:

Total for 2500 units is 6000. 50% of this i.e. \$ 3000 is variable & the balance 50%, i.e. \$ 3000 is fixed. Variable cost per unit is \$ 1.20.

Illustration 3:

A single product is manufactured by PS Ltd. which is facing severe competition in selling it at \$ 100 per unit. At 60% level of activity, the company is operating & at that level sales are \$ 2400000. Variable costs are \$ 60 per unit. At \$ 180000, when output is nil, the semi-variable costs may be considered as fixed & the variable element is \$ 500 for each additional 1% level of activity. At the present level of activity, fixed costs are \$ 300000 but these costs are expected to increase by \$ 100000, if a level of activity of 80% or above are reached.

To cope with the competition, a proposal of reducing the selling price by 5% is being considered by the management of the company. You are required to prepare a statement showing the operating profit at level of activity of 60%, 70% & 80% assuming that:

- a. the selling price remaining at \$ 100, &
- b. there is a reduction in the selling price by 5%.

Also show the number of units which will be required to be sold for maintaining the present profits if the company decides to reduce the selling price of the product by 5%.

Solution:

Flexible Budget

Activity level	60%	70%	80%
Sales units	24000	28000	32000
	\$	\$	\$
Variable costs \$ 60 per unit	1440000	1680000	1920000
Add: \$ 500 for every 1% of activity	<u>30000</u>	<u>35000</u>	<u>40000</u>
Total Variable costs	1470000	1715000	1960000
Fixed Costs (including fixed parts Of semi-variable costs)	<u>480000</u>	<u>480000</u>	<u>580000</u>
Total costs	<u>1950000</u>	<u>2195000</u>	<u>2540000</u>
Sales @ \$ 100 per unit	2400000	2800000	3200000
Profit	450000	605000	660000
Sales @ 95 per unit	2280000	2660000	3040000
Profit	330000	465000	500000

Volume of sales to maintain existing profit of \$ 450000 with reduced selling price of \$ 95.

<i>Contribution per unit:</i>	\$
Sales at 60% level	2280000
Variable costs	<u>1470000</u>
Total contribution	<u>810000</u>

$$\text{Contribution per unit} = \frac{\$ 810000}{24000} = \$ 16.875$$

<i>Volume of Sales required:</i>	\$
Desired profit	450000
Fixed costs	<u>480000</u>
Contribution required	<u>930000</u>

$$\text{Volume of sales required} = \frac{\text{Contribution required}}{\text{Contribution per unit}} = \frac{\$ 930000}{16.875} = 55111 \text{ units.}$$

Illustration 4:

A factory is currently running at 50% capacity & produces 5000 units at a cost of \$ 90 per unit as per below details:

Material	\$ 50
Wages	\$ 15
Factory overheads	\$ 15 (40% fixed)
Administration overheads	\$ 10 (50% fixed)

The current selling price is \$ 100 per unit. Material cost per unit, at 60% capacity, increases by 2% whereas selling price per unit falls by 2%. However, material cost per unit increases, at 80% capacity working, by 5% & selling price per unit falls by 5%.

Prepare a marginal cost statement showing for the three capacity levels, the total cost & profit. Also comment on the profitability at these levels of performance.

Solution:

	Marginal Cost Statement					
	50% capacity 5000 units		60% capacity 6000 units		80% capacity 8000 units	
	Per unit	Total	Per unit	Total	Per unit	Total
<i>Variable costs:</i>	\$	\$	\$	\$	\$	\$
Materials	50	250000	51	306000	52.50	420000

Labour	15	75000	15	90000	15	120000
Factory Overheads	9	45000	9	54000	9	72000
Administrative Overheads	5	25000	5	30000	5	40000
Total Variable Costs	79	395000	80	480000	81.50	652000
Sales	100	500000	98	588000	95.00	760000
Contribution	21	105000	18	108000	13.50	108000

Fixed Costs:

Factory Overhead	30000	30000	30000
Administrative Overheads	25000	25000	25000
Total Fixed Costs	55000	55000	55000
Profit	50000	53000	53000
% of profit on sale	10%	9%	7%

Comments:

- When the level of activity has been raised from 50% to 60%, profit increases from \$ 50000 to \$ 53000 whereas when the level of activity raised to 80% capacity, profit does not increase further.
- % of profits on sales gradually decreases as the level of activity rises.
- The increase of production up to 60% level of activity is profitable & not beyond that.