

## Management Accounting Flexible Budgeting (Higher Level)

One of the objectives of budgeting is to control costs. This is done by preparing a report which compares the actual costs for an accounting period with the planned or budgeted costs and shows the variances or differences between them. This is easy when the actual level of activity is the same as the budgeted level.

This topic is yet another of the "What if" questions, ie. If we know our costs at two different levels of production what would they be at a new level of production. To answer the question we must be able to separate Variable Costs from Fixed Costs like we did in CVP analysis.

This introduces the idea of Mixed Costs, ie. costs which have a fixed as well as a variable element, eg our phone bill has a fixed charge for rental of the phone line as well as a variable charge for each charge we make.

How we find our variable charges per unit are by seeing how the cost rises as production rises. For example, if costs rise by €3,000 when production rises by 1,000 units, then the variable cost is €3 per unit. We then cost production at any level of production to see if there is a fixed cost involved.

**Ex.**

A furniture manufacturer has budgeted to produce 2,000 chairs this month. The budgeted direct material cost is €3 per chair (€6,000). Actual Production is 2,000 chairs but direct material cost is €6,200.

We can see clearly that there is an adverse variance in material cost of €200 as the direct material cost is €200 more than expected.

However, when the actual level of activity is different to the planned or budgeted level, the comparison cannot be made so easily.

<b>Budgeted production</b>	<b>2,000 chairs</b>	<b>Budgeted direct material costs</b>	<b>€6,000</b>
<b>Actual production</b>	<b>2,400 chairs</b>	<b>Actual direct material costs</b>	<b>€6,720</b>

It is not correct to compare actual costs of €6,720 with budgeted costs of €6,000 and to conclude that the material costs were €720 over budget.

If we look closer we can see the figures show that:

$$\text{Actual material costs} = \frac{\text{€6,720}}{2,400 \text{ units}} = \text{€2.80 per unit}$$

$$\text{Budgeted material costs} = \frac{\text{€6,000}}{2,000 \text{ units}} = \text{€3 per unit}$$

So we can see that in fact there is a favourable variance in the direct material costs of €0.20 per units of production.

It would be misleading then to compare the budgeted costs with the actual costs at one level of activity with the actual costs at a different level of activity.

In order to make a valid comparison between the actual costs and budgeted costs, it is necessary to adjust (or flex) the original budget to the actual level of activity. This procedure is known as **flexible budgeting**.

### Cost Behaviour & Flexible Budgeting (The Budget Formula)

When we are constructing flexible budgets it is prudent to be aware that:

- Variable costs vary directly with changes in the level of activity
- Fixed costs do not vary with changes in activity levels, they remain the same
- A mixed or semi-variable cost contains an element of cost, which is fixed and a variable element that will change with the level of activity

A budget formula is constructed for each item of mixed cost to allow for the fixed and the variable elements. In the example that follows, the budget formula for maintenance costs is describes as €2,000 fixed cost (FC) + €2 per unit of production.

**Ex.**

The budgeted machine maintenance costs in a factory are as follows:

- a. Fixed maintenance costs of €2,000 (which do not change with the level of activity)
- b. A variable cost of €2 per unit of production

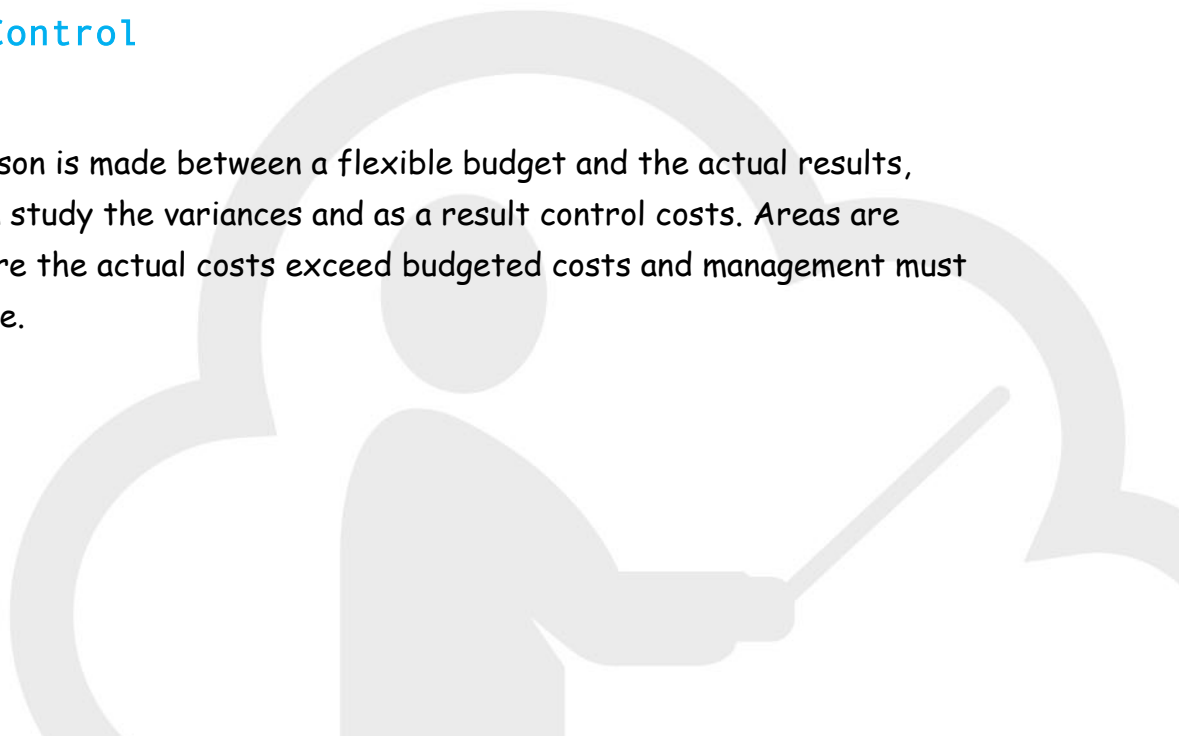
Calculate the budgeted machine maintenance costs at budgeted production levels of 2,000, 3,000 and 5,000 units of production.

**Solution:**

	Activity Level (units)		
	2,000	3,000	5,000
	€	€	€
<b>Fixed element</b>	2,000	2,000	2,000
<b>Variable element (€2 per unit)</b>	4,000	6,000	10,000
<b>Total budgeted cost</b>	6,000	8,000	12,000

## Budgetary Control

When a comparison is made between a flexible budget and the actual results, management can study the variances and as a result control costs. Areas are highlighted where the actual costs exceed budgeted costs and management must investigate these.



When analysing variances, remember that an individual departmental manager may not be responsible for the total amount of the variance. The previous example shows an adverse variance in direct materials costs. This could be due to:

- The purchase price of materials being higher than expected (price variance)
- The quantities of materials used being higher than expected (usage variance)

The quantities of materials used would probably be the responsibility of the production department manager and so would be controllable costs for that area. However, the price paid for materials may be the responsibility of the purchasing manager and would be an uncontrollable cost as far as the production manager is concerned.

Similarly, the labour hours worked may be controllable by the production manager, but the wage rates paid may be the responsibility of the personnel department.

When handing over responsibility for a cost variance, the price and quantity effects should be taken into account in order to ensure that managers are held responsible only for costs that are controllable by them.

**Let's take a look at a question:**

### Q22.2

A manufacturing company provides you with the following budgeted information relating to product X:

Direct materials	€4 per unit of output
Direct labour	€6 per unit of output
Indirect labour	€20,000 fixed cost + €3 per unit of output
Indirect materials	Zero fixed costs + €0.50 per unit of output
Power	Zero fixed cost + €1 per unit of output
Light and heat	€6,000 fixed cost
Maintenance	€3,000 fixed cost + €2 per unit of output
Depreciation of machinery	€8,000 fixed cost

You are required to:

- Prepare flexible budgets for activity levels of 5,000, 6,000 and 7,000 units of output.

<b>Flexible Budget</b>				
<i>Expense Item</i>	<i>Budget Formula</i>	<i>Activity Levels (units of output)</i>		
		<i>5,000</i>	<i>6,000</i>	<i>7,000</i>
<i>Direct materials</i>	€4 per unit	€ 20,000.00	€ 24,000.00	€ 28,000.00
<i>Direct labour</i>	€6 per unit	€ 30,000.00	€ 36,000.00	€ 42,000.00
<b>Overheads</b>				
<b>Variable:</b>				
<i>Indirect materials</i>	Zero FC + €·50 per unit	€ 2,500.00	€ 3,000.00	€ 3,500.00
<i>Power</i>	Zero FC + €1 per unit	€ 5,000.00	€ 6,000.00	€ 7,000.00
<b>Mixed:</b>				
<i>Indirect labour</i>	€20,000 FC + €3 per unit	€ 35,000.00	€ 38,000.00	€ 41,000.00
<i>Maintenance</i>	€3,000 FC + €2 per unit	€ 13,000.00	€ 15,000.00	€ 17,000.00
<b>Fixed:</b>				
<i>Light &amp; heat</i>	€8,000 FC	€ 8,000.00	€ 8,000.00	€ 8,000.00
<i>Depreciation</i>	€6,000 FC	€ 6,000.00	€ 6,000.00	€ 6,000.00
<b>Budgeted manufacturing cost</b>		€ 119,500.00	€ 136,000.00	€ 152,500.00

## Budgeting Recap

### Outline The Advantages of Budgeting To A Business.

- Provide advance warning of potential difficulties.
- Provide a method of comparing budgeted with actual performance.
- Are helpful when trying to attract investment.
- Can be used as a decision-making resource.
- Are useful for providing direction and motivation to staff.

### Why Are Flexible Budgets Prepared and What Do They Show?

Flexible budgets are used to show how costs are likely to change at different levels of production. They show the different variable and mixed costs at different production outputs and also enable the firm to predict profit at these outputs. Actual costs can later be compared with these budgets to measure performance and plan for the future.

### **What Is An Adverse Variance and What Does It Show?**

This is where the difference observed between an actual cost or revenue and the previously budgeted amount is worse (e.g. budgeted expenses turn out to be higher or budgeted income turns out to be lower).

### **Why Might An Adverse Variance Arise in Direct Materials?**

If the purchase price increased. If higher quantities were required.

### **Explain With Examples, 'Controllable' and 'Uncontrollable' Costs.**

Controllable costs are costs over which the firm exercises power, such as wages, whereas an uncontrollable cost falls outside the direct power of the firm, such as price of raw materials.

### **What Factors Does The Firm Take Into Account When Calculating Their Budgeted Sales Figure For The Year?**

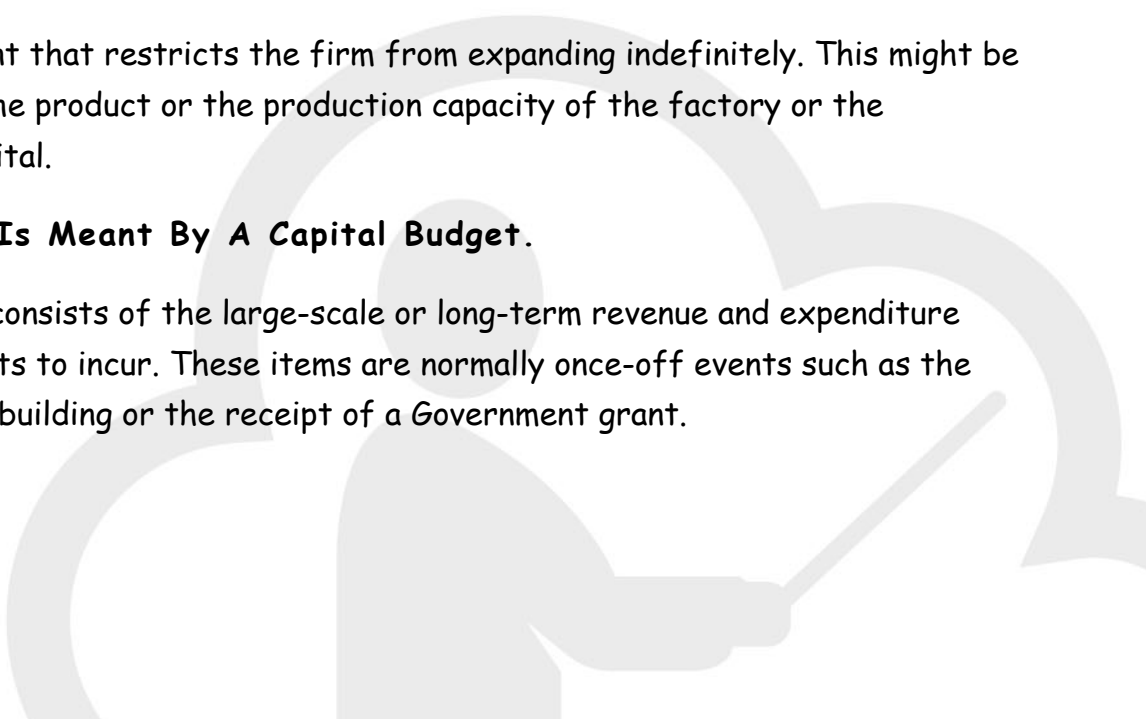
- Last year's sales.
- The state of the economy.
- Sales of competing firms.
- Results of market research.
- Trends in the market.

### **Explain 'Principle Budget Factor.**

This is the element that restricts the firm from expanding indefinitely. This might be the demand for the product or the production capacity of the factory or the availability of capital.

### **Explain What Is Meant By A Capital Budget.**

A capital budget consists of the large-scale or long-term revenue and expenditure that a firm expects to incur. These items are normally once-off events such as the construction of a building or the receipt of a Government grant.



**Define 'Cash Budget' and Describe Two of Its Advantages.**

A cash budget is an estimate of the future income and expenditure of the firm. Cash budgets enable the firm to identify periods of time in the future when difficulties may arise and also provide a method of comparing the firm's actual performance with the previously budgeted figures.

**Explain How Budgeting Solves The Problem of Mixed Costs.**

A mixed cost is one that is partly fixed and partly variable. The 'HighLow' method is used in budgeting to separate these two elements of the cost and to make it possible to make predictions about changes to the mixed cost as production levels vary. The 'High-Low' method finds the difference between the costs and units and then divides one into the other to give us the variable portion of the cost. This then makes it possible to identify the fixed portion.

**Explain the Term Budgetary Control.**

This is the process of preparing a budget, observing whether the actual outcomes exceed or fall short of the budget, identifying the reasons for the observed differences, and then deciding what courses of action should be taken before preparing the next budget.



## Homework

### Q.23.2

#### 8. Overhead Apportionment and Flexible Budgeting

- (a) Heron Ltd has two Production Departments 1 and 2 and two ancillary Service Departments X and Y. The following are the expected overhead costs for the next 6 months:

Overhead	Total €
Depreciation of equipment	20,000
Depreciation of factory buildings	24,000
Factory heating	8,000
Factory cleaning	4,000
Factory canteen	5,400

The following information relates to the Production and Service Departments of the Factory:

	Production		Service	
	Dept. 1	Dept. 2	Dept. X	Dept. Y
Volume in cubic metres	1,000	2,000	600	400
Floor area in square metres	800	600	400	200
Number of employees	140	100	70	50
Book value of equipment	€10,000	€15,000	€9,000	€6,000
Machine hours	4,000	1,000		

**You are required to:**

- Calculate the overhead to be absorbed by each Department stating clearly the basis of apportionment used.
  - Transfer the Service Department costs to Production Departments 1 and 2 on the basis of machine hours.
  - Calculate a machine hour overhead absorption rate for Departments 1 and 2.
  - Explain why it is necessary to transfer Service Department costs to Production Departments 1 and 2.
- (b) Mixed costs can be separated into their fixed and variable elements by using records of costs from previous periods. Edant plc manufactures a single component for the motor industry. The following production costs and output levels have been recorded during March, April and May 2011:

Output Levels	60%	80%	90%
Units	12,000	16,000	18,000
<b>Costs</b>	<b>€</b>	<b>€</b>	<b>€</b>
Direct materials	156,000	208,000	234,000
Direct Labour	108,000	144,000	162,000
Production Overheads	79,200	102,000	113,400
Other overhead costs	64,800	85,200	95,400
Administration expenses	30,000	30,000	30,000
	<u>438,000</u>	<u>569,200</u>	<u>634,800</u>

Profit is budgeted to be 20% of sales. **Other overhead costs** can be separated into their fixed and variable elements as follows: **Variable cost per unit is €5.10 and Fixed Cost €3,600.**

**You are required to:**

- Separate production overheads into fixed and variable elements.
- Prepare a Flexible Budget for 95% Activity Level using Marginal Costing principles and show the contribution.
- Explain, with examples, 'controllable' and 'uncontrollable' costs.

**(80 marks)**



**Question 8**

(a)

**50**

Overhead	Basis	Total	<u>Production</u>		<u>Service</u>	
			Dept 1	Dept 2	Dept X	Dept Y
Dep of equipment	[1] Book value	20,000	5,000 [1]	7,500 [1]	4,500 [1]	3,000 [1]
Dep of buildings	[1] Floor area	24,000	9,600 [1]	7,200 [1]	4,800 [1]	2,400 [1]
Factory heating	[1] Volume	8,000	2,000 [1]	4,000 [1]	1,200 [1]	800 [1]
Factory cleaning	[1] Floor area	4,000	1,600 [1]	1,200 [1]	800 [1]	400 [1]
Canteen	[1] No. Employees	<u>5,400</u>	<u>2,100 [1]</u>	<u>1,500 [1]</u>	<u>1,050 [1]</u>	<u>750 [1]</u>
		<u>61,400</u>	<u>20,300 [1]</u>	<u>21,400 [1]</u>	<u>12,350 [1]</u>	<u>7,350 [1]</u>

(ii)

	<u>Production</u>		<u>Service</u>	
	Dept 1	Dept 2	Dept X	Dept Y
Total Cost	20,300	21,400	12,350	7,350
Apportion Dept X to Production	9,880 [2]	2,470 [2]	(12,350)	
Apportion Dept Y to Production	<u>5,880 [2]</u>	<u>1,470 [2]</u>		(7,350)
	<u>36,060</u>	<u>25,340</u>		

(iii)

Machine hour absorption rate			
Dept 1	$\frac{36,060}{4,000}$	=	€9.015 per machine hour [4]
Dept 2	$\frac{25,340}{1,000}$	=	€25.34 per machine hour [4]

(iv) [5]

Service departments can't recover costs. Service departments are secondary to production departments and as a result, service department costs must be transferred to production departments on an equitable basis e.g. machine hours. Overheads can only be recovered through production i.e. they are included as a cost of production.



(b)

30

(i)

Production overheads	Units	Total Cost €
High	18,000	113,400
Low	<u>12,000</u>	<u>79,200</u>
Difference	<u>6,000</u>	<u>34,200</u>

The variable cost of 6,000 units is 34,200, therefore the variable cost per unit is €5.70 [4]

Total production overhead cost	79,200	102,000	113,400
Less variable costs	<u>(68,400)</u>	<u>(91,200)</u>	<u>(102,600)</u>
Therefore, Fixed cost	<u>10,800</u>	<u>10,800</u>	<u>10,800</u> [4]

(ii)

**Flexible Budget in Marginal Costing format**

	€	€
Sales		834,500 [1]
Less: Variable Costs		
Direct Materials (19,000 x 13)	247,000 [2]	
Direct Labour (19,000 x 9)	171,000 [2]	
Production overheads (19,000 x 5.70)	108,300 [1]	
Other overhead costs (19,000 x 5.10)	<u>96,900 [1]</u>	<u>(623,200)</u>
<b>Contribution</b>		<b>211,300 [4]</b>
Less Fixed Costs		
Production overheads	10,800 [1]	
Other overheads	3,600 [1]	
Administration	<u>30,000 [1]</u>	<u>(44,400)</u>
<b>Profit</b>		<b><u>166,900 [2]</u></b>

Total cost is 80% of sales.

Total cost is 623,200 + 44,400	=	667,600
80% of sales	=	667,600
100%	=	834,500

(iii) [6]

**Controllable Costs:** Are costs that can be controlled by the manager of a cost centre. She/he will make the decision about the amount of the cost or if the cost should be incurred and can be held responsible for variances in these costs. E.g.- all variable costs are controllable. Commission to sales personnel can be controlled by the sales manager.

**Uncontrollable Costs:** Are costs over which the manager of a cost centre has no control and therefore cannot be held responsible for variances in these costs. E.g.- rates to the local authority are uncontrollable.