

this chapter covers . . .

In this chapter we examine:

- *different methods of budgeting: incremental budgeting, zero based budgeting and programme based budgeting*
- *cost behaviour in relation to activity*
- *using marginal costing and absorption costing for budgets*
- *fixed budgets and flexed budgets*
- *Activity Based Budgeting and life cycle budgeting*
- *management reporting aspects of budgeting: monitoring budgets, feedback, feedforward and the format of budgets and reports*

NVQ PERFORMANCE CRITERIA COVERED

unit 9: CONTRIBUTING TO THE PLANNING AND CONTROL OF RESOURCES

element 9.1: prepare forecasts of income and expenditure

- B communicate with relevant individuals and give them the opportunity to raise queries and to clarify forecasts*
- C prepare forecasts in a clear format with explanations of assumptions, projections and adjustments*
- D review and revise the validity of forecasts in the light of any significant anticipated changes*

element 9.2: prepare draft budget proposals

- A present to management draft budget proposals in a clear and appropriate format and on schedule*
- B verify that draft budget proposals are consistent with organisational objectives, and include all relevant data and assumptions*
- D communicate with budget holders in a manner which maintains goodwill and ensures budget proposals are agreed with budget holders*



element 9.3: monitor the performance of responsibility centres against budgets

- A *check and reconcile budget figures on an ongoing basis*
- B *correctly code and allocate actual cost and revenue data to responsibility centres*
- C *clearly and correctly identify variances and prepare relevant reports for management*
- D *discuss with budget holders and other managers any significant variances and help managers take remedial action*

APPLICATIONS OF BUDGETING

In Chapter 8, we considered the purposes of budgeting and the steps involved in budget preparation. The calculations in Chapter 8 show how budgets can be prepared for the main activities of an organisation, starting from forecasts for sales and allowing for limitations imposed by the key budget factor.

Chapter 9 developed further the calculations for production budgets, and hence for materials usage, purchases and labour utilisation budgets.

In this chapter, we examine various methods which can be used as the basis for the preparation of budgets, either as the principles on which all budgets are based, or particularly for functional budgets such as the administration budget. Functional departments which support the main operations of the organisation may not be so dependent on sales levels. Budgeting in non-profit-making organisations also requires a different approach, as starting from forecasts of demand may not be appropriate.

The methods to be considered are:

- incremental budgeting
- zero base budgeting
- programme based budgeting

INCREMENTAL BUDGETING

Incremental budgeting is a traditional method, widely used in commercial organisations and in the public sector. Incremental budgeting means

basing the budget for a department or function on that of the previous period, usually adjusting for inflation by a percentage increase.

Specific changes, such as a planned expansion or reduction in activities, would also be allowed for. In some cases the previous year's actual costs may be used as a starting point, rather than the budget, particularly if the actual costs were lower.

practical example

Quenchit Ltd is a water bottling company. Transport costs for last year amounted to £120,000. Planned expansion is expected to result in £10,000 additional transport costs (estimated at current prices). Inflation is expected to be 3%.

The transport budget for the next year could be based on:

$£120,000 + £10,000 = £130,000$ to allow for expansion,
then $£130,000 \times 103\% = £133,900$ to allow for inflation.

advantages of incremental budgeting

The **advantages** of the incremental budgeting method are:

- the budget is stable and change is gradual and planned
- managers can operate their departments on a consistent basis
- the system is relatively simple to operate and easy to understand
- conflicts should be avoided if departments can be seen to be treated similarly, and coordination between budgets is easier to achieve
- the impact of change can be seen quickly

disadvantages of incremental budgeting

There are, however, a number of **criticisms** of this method:

- incremental budgeting assumes activities and methods of working will continue in the same way, giving no incentive for developing new ideas
- there is no incentive to try to reduce costs – on the contrary, spending up to the budget is encouraged by this method, so that next year the level of budget is maintained
- the budgets may become out of date, and no longer relate to the level of activity or the type of work being carried out
- the priority for resources may have changed since the budgets were set originally
- there may be 'budgetary slack' built in to the budgets, which is never reviewed – this means that managers have overestimated their requirements in the past, in order to obtain a budget which is easier to work to, and which will allow them to achieve favourable results

For example . . . a city council using incremental budgeting would continue to budget at the same level, increased for inflation, for hospitality and catering relating to meetings, visitors and so on. This would encourage staff to spend up to the budget, even if the number and timing of meetings or visits changed. There would be no incentive to review catering provision or to look for more cost-effective ways of providing suitable hospitality.

Because of these problems, which can occur in a similar way throughout an organisation, the incremental approach may not lead to the best use of its resources. A department which has had a large share of the total funds available over a number of years may no longer be as important to the organisation, whereas newer departments which are gradually increasing in importance will need a greater share.

ZERO BASE BUDGETING (ZBB)

Zero base budgeting is a method which was developed in the 1970s with a view to eliminating some of the problems of incremental budgeting. It takes the opposite view: instead of assuming everything will continue as before, the focus is on achieving the organisation's objectives in the most efficient way. Zero Base Budgeting means that

the budget for each budget centre starts from a base of zero for each period. Budgets for proposed activities are then put forward, assessed and prioritised (in relation to the organisation's objectives) and allocated funds in order of priority.

The stages in the process are as follows:

- the functions of the organisation are analysed to identify the structure of departments to be used as budget centres
- the work of each department (budget centre) is then analysed to identify the activities actually carried out
- starting from a base of zero, budgets are prepared in each budget centre, showing the costs and benefits of the work of the department; these budgets show the expected results at several different levels of activity and are called 'decision packages'
- the decision packages must then be judged by managers and put in order according to how efficiently they contribute towards the organisation's objectives
- the total funds available are allocated to decision packages in order of priority, thus deciding which activities are to be carried out and at what level – if a particular activity is obsolete or contributing nothing, it will receive no funds and will be discontinued.

advantages of zero base budgeting

The advantages of the zero base budgeting method are:

- this system focuses the use of resources on achieving the organisation's objectives
- budget centre managers have to re-evaluate in detail the cost-effectiveness of the working methods and results achieved in their departments
- new projects are compared with existing work, so that innovation is encouraged, rather than assuming existing activities must continue
- allocation of resources is linked to the achievement of results
- wastage and budgetary slack should be eliminated, because budgets which are not cost-effective will not be given funds
- planning and budgeting is combined into a single process when the decision packages to be funded are chosen

disadvantages of zero base budgeting

Zero base budgeting is also criticised, because:

- the process itself is very complex and therefore costly to operate
- by separating different activities, links between them may not be allowed for, leading to an uncoordinated approach
- short-term benefits may be emphasised in the decision packages, to the detriment of long-term planning
- the process of judging and prioritising the decision packages may be extremely difficult and it may be affected by the internal politics of the organisation, so that it is not really objective

Zero base budgeting can only be applied where different levels of a particular type of work are possible and where the costs and benefits can be identified. Therefore it is more likely to be appropriate for service departments or service organisations and for non-profit-making organisations than for direct cost budgets in manufacturing. As we have seen in Chapter 8, direct cost budgets are more dependent on forecasts of demand for products and can be justified on that basis. Priorities may change, however, between service departments, making a review starting from a base of zero a useful tool.

For example, maintenance of machinery will need a greater share of funds when an organisation is highly automated, and if there is a corresponding reduction in the workforce, it will reduce the necessity for a large personnel department.

Zero base budgeting can be applied to **'discretionary' costs**, where the level of expenditure and the methods to be used can be decided by managers.

For example:

- **training costs:** decisions can be made between ‘packages’ detailing the costs and benefits of in-house training, computer-based training, day release and block release, at different levels
- **advertising:** decisions can be made between ‘packages’ detailing the expected benefits from different levels of expenditure, using various methods of advertising, particularly where new opportunities such as websites become available and older methods may become less effective
- **credit control:** decisions can be made between ‘packages’ detailing the costs of different levels of activity – increasing the activity would mean more frequent checks and chasing of debtors and hence better control – for each control level, the financial benefits in terms of reducing finance costs and avoiding bad debts would be estimated and compared with the costs

PROGRAMME BASED BUDGETING

Programme based budgeting is a method which is applicable to non-profit-making organisations. Programme based budgeting means

breaking down the work of the organisation into ‘programmes’ designed towards achieving its various objectives.

Several departments within the organisation may contribute towards a single programme. The total funds available are shared between the programmes, rather than being split into budgets for departments.

It is usually the case that insufficient funds are available to achieve all the desired objectives, and decisions have to be made as to which programmes are to be carried out and what level of work can be supported. The choice of programmes should ensure that cost-effective methods are used, to achieve as much as possible (in terms of the organisation’s objectives) with the total funds available.

practical examples

A **local authority** may decide to allocate funds to a programme designed to improve services to elderly people. This may include work from the housing department on security and insulation, an allocation of funding towards increased transport subsidies, input from the social services department to improve day care, and so on. It would be necessary to prepare a budget for the programme as a whole, broken down into budgets for costs of each aspect of the programme.

A **charity** may have money donated to help alleviate famine in a particular area. Decisions may be made between immediate relief programmes and longer-term programmes to provide clean water, support for agriculture and education.

COST BEHAVIOUR AND BUDGETS

When setting budgets it is essential to take into account how costs behave in relation to the amount of work which is to be carried out. It is impossible to prepare a realistic budget for a particular amount of work unless it is known whether, for example, costs remain fixed, increase steadily or go up in steps as the amount of work increases. The measurement of an amount of work is usually referred to as the 'level of activity' and it must be measured in appropriate cost units for the type of work involved. In manufacturing, numbers of units produced can be used as a measure of level of activity. In other types of organisation, the cost units used must relate to the work being done, for example miles travelled in a transport business, or occupied room-days in a hotel.

fixed and flexed budgets

When the level of activity changes, it is expected that the total of all costs (and the total income) will change. Information about how each type of cost behaves will enable budgets to be adjusted for different levels of activity. A budget for one specific level of activity is referred to as 'fixed'. A budget adjusted for a change in level of activity is called a 'flexed' or 'flexible' budget. If actual results are to be compared with budgets for the purposes of performance measurement, such adjustments would be necessary to ensure that the comparison is of 'like with like'.

In variance analysis (in Unit 8, see Chapters 2, 3 and 4), we compare the actual results with the standard cost of actual output, which is a flexed budget where standard costing is being used.

practical example

If a budget is set in a manufacturing business for production of 10,000 units of a product, then it will not be applicable if production changes to 11,000 units or to 9,000 units. With information about how each part of the cost may change (or not) in relation to production, new adjusted budgets can be prepared for 11,000 units and 9,000 units. These are the 'flexed' or 'flexible' budgets as opposed to a single level 'fixed' budget.

A manager of a department which produced 11,000 units of a product would not expect the costs to be measured against those for making 10,000 units. Fair comparison would be with the flexed budget for 11,000 units. This is the principle of comparing 'like with like'.

If standard costing and variance analysis were being used in this business, variances would be calculated as the difference between the total actual costs and the total standard costs for the 11,000 units of actual output.

This example illustrates two aspects of budgeting which are important to the manager responsible: the budget must be presented in a form that is easy to

use, and it must be accepted as giving a fair comparison. A flexible budget is preferable from the departmental manager's point of view.

Cost behaviour is examined in Chapter 1 for the purposes of marginal costing. Marginal costing depends on being able to split costs into their fixed and variable parts. In marginal costing, the cost of each unit of output is based on variable costs only, the fixed costs being regarded as time based and linked to the accounting period.

The main types of cost behaviour which you will be expected to apply in preparing flexed budgets are:

- variable costs
- fixed costs
- step costs
- semi-variable costs

variable costs

A cost is described as variable if the total cost varies in direct proportion to the level of activity. In other words, it depends on the number of cost units, the amount per unit being constant.

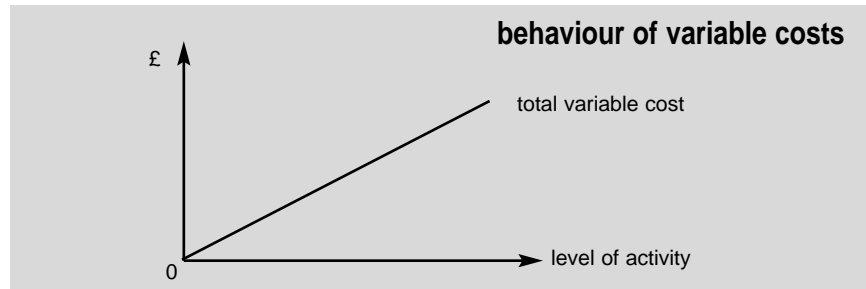
Total variable cost = variable cost per unit x number of units

For example:

Quenchit Ltd is a water bottling company. The cost to the company of the bottles used is £0.08 each. The total cost of bottles varies in proportion to the number of bottles used and is therefore a variable cost.

Total cost of bottles = £0.08 x number of bottles used.

A graph showing the behaviour of the total cost against level of activity is shown below.



In some cases, the cost per unit may remain constant only within a certain relevant range of levels of activity. Large changes in the number of units produced may alter the cost per unit and hence the behaviour of the total cost. For example, the cost per unit of direct materials may be reduced by bulk purchase discounts when larger amounts are required.


**Case
Study**

KANN LIMITED: VARIABLE COSTS

Kann Ltd manufactures metal boxes. The total cost of direct materials is £42,000 for making 350,000 boxes and £51,600 for making 430,000 boxes.

required

- 1 Calculate Kann Ltd's direct material cost per unit at each of the given levels of output and hence determine whether it behaves as a variable cost.
- 2 Calculate the total cost of direct materials for making 400,000 boxes.

solution

- 1 £42,000 for 350,000 boxes: $£42,000 \div 350,000 = £0.12$ per box
 £51,600 for 430,000 boxes: $£51,600 \div 430,000 = £0.12$ per box

Therefore direct material cost is a constant amount per unit and hence behaves as a variable cost. We can assume it is £0.12 per box for output between 350,000 boxes and 430,000 boxes.

- 2 Output of 400,000 boxes is within this range.
 Total variable cost = variable cost per unit x number of units
 For 400,000 boxes:
 Total direct material cost = $£0.12 \times 400,000 = £48,000$.

fixed costs

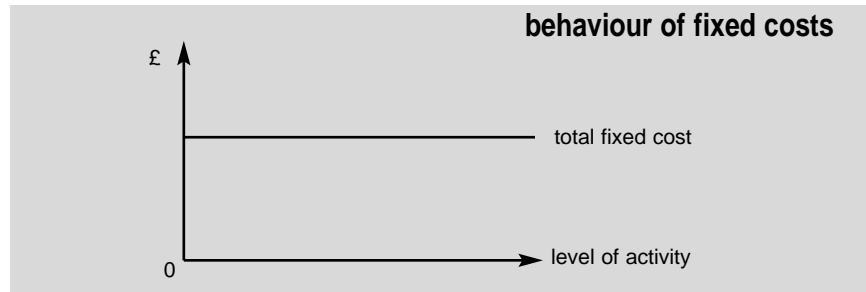
A cost is described as fixed if the total cost does not change when the level of activity changes.

The fixed nature of the cost will only apply when the level of activity changes within a certain relevant range. If major changes occur, such as doubling production or ceasing to make a product, then all costs are likely to change.

Rent is an example of a fixed cost, because once rent is paid to have space available, changes in the amount of work carried out in that space will not affect the total rent. The relevant range would cover the amounts of work possible within the space available. The rent would change if the amount of work increased beyond this capacity.

Notice that in defining fixed costs, we are not referring to costs remaining unchanged from one time period to another. All costs will eventually change

over periods of time. A graph showing the behaviour of the total cost against level of activity for a fixed cost is shown below.

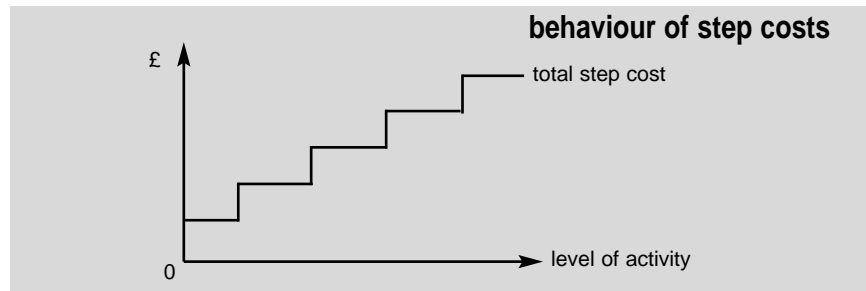


step costs

A cost is described as a step cost if its total changes in steps at certain levels of activity, remaining unchanged in between.

The name clearly corresponds to the graph showing the behaviour of the total cost against level of activity for a step cost – see below.

Costs which behave as step costs are often related to machines or people who can deal with any number of units of work, up to a maximum number. When the maximum is reached, an additional machine or person is required.



practical examples

A **pre-school nursery** requires one carer for every six children. For more than six and up to twelve children, two carers are required. For thirteen, another carer must be employed, and so on. The total cost of carers' wages will behave as a step cost.

The **reprographics department** of a large organisation uses photocopiers which are leased. Each machine can produce 10,000 copies in a given period. If the organisation's requirements go above 10,000 for the period, another machine will be leased. The total cost of leasing photocopiers will behave as a step cost.

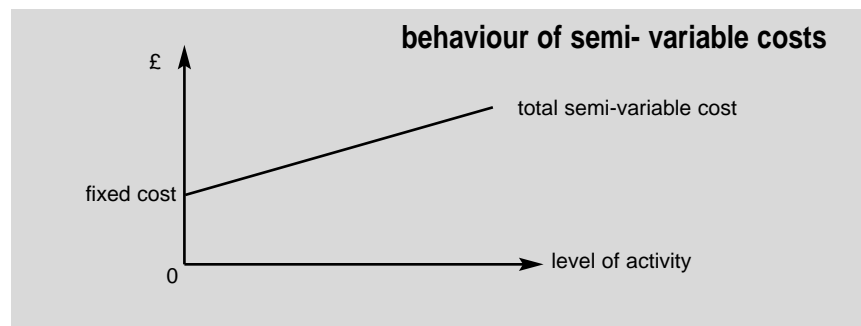
semi-variable costs

A cost is described as semi-variable (or sometimes semi-fixed) if the total cost is made up of a variable part and a fixed part.

Any cost which consists of a fixed charge plus an amount per unit is a semi-variable cost. Telephone bills may be of this form: a fixed line rental plus a variable amount dependent on the number of minutes of call time, for example.

Total semi-variable cost = Fixed cost + (variable cost per unit x number of units)

The graph showing the behaviour of the total cost against level of activity for a semi-variable cost is shown in the graph below. The calculation is illustrated in the Case Study on the next page.



limitations of cost behaviour analysis

The four kinds of cost behaviour described above are not the only possible cost behaviour patterns. In some cases, the actual behaviour of the cost may only approximate to one of these patterns, but useful information can still be obtained using the approximation. Also, a particular pattern of behaviour may only be applicable within a certain relevant range of levels of activity, but again useful information can be obtained within that range.

Using a pattern of behaviour to calculate costs for a level of activity within a given range is called 'interpolation'. Calculations for levels outside the range involve 'extrapolation' and careful consideration must be given to the usefulness of the information obtained in this case, because it may not be realistic to assume that the pattern of behaviour will continue beyond the given range.

The assumption underlying marginal costing is that all costs behave as fixed, variable or semi-variable costs, so that the total of all costs of an organisation can be split into fixed and variable parts. Provided that this assumption is realistic over a relevant range of levels of activity, then useful information can be obtained.

Case Study

MILLIE LIMITED: SEMI-VARIABLE COSTS

Production overheads in a manufacturing company have been identified as semi-variable. They consist of fixed costs of £120,000 plus £2.80 per unit produced, for a range of levels of production from 15,000 units to 30,000 units for the period.

required

Calculate the total production overheads for

- 1 20,000 units
- 2 24,500 units

Why would the same calculation be inappropriate for 40,000 units?

solution

- 1 Total production overheads for 20,000 units would be:

$$\begin{aligned} & \text{£}120,000 + (\text{£}2.80 \times 20,000) \\ & = \text{£}120,000 + \text{£}56,000 \\ & = \text{£}176,000 \end{aligned}$$

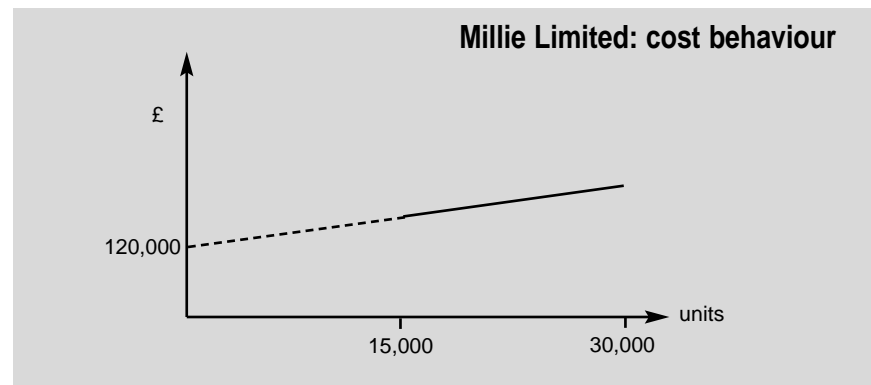
- 2 Total production overheads for 24,500 units would be:

$$\begin{aligned} & \text{£}120,000 + (\text{£}2.80 \times 24,500) \\ & = \text{£}120,000 + \text{£}68,600 \\ & = \text{£}188,600 \end{aligned}$$

The part of the calculation in brackets is the variable part of the cost, which depends on the number of units.

It would not be realistic to use this data and this method to calculate the total production overheads for 40,000 units, because that level of activity is beyond the relevant range. We cannot assume the same cost behaviour outside the range.

The following graph illustrates the behaviour of the total cost in this Case Study.



the high-low method

It is important to be able to split a semi-variable cost into its fixed and variable parts in order to prepare a flexible budget. The fixed part will remain unchanged and the variable part can be calculated for a different level of activity. The method you will be expected to use to analyse a semi-variable cost is the 'High-Low' method or 'incremental approach', which may be familiar to you from your earlier studies.

The high-low method can be used where the total of a semi-variable cost is known for at least two different activity levels. If the total is known for more than two levels, then the highest and lowest are chosen for the calculation.

The Case Study that follows illustrates the high-low method.

Case Study

HILO PRODUCTS: THE HIGH LOW METHOD

Hilo Products makes ladders. We are given the total of a semi-variable cost at four different levels of activity, as follows:

Level of activity (units)	400	650	800	900
Total cost (£)	6,200	6,950	7,400	7,700

First we identify the lowest and highest totals, which are:

£6,200 for 400 units and £7,700 for 900 units.

To calculate the variable cost per unit, we use the fact that the extra cost has been caused by the variable cost of the extra units. That is:

	Cost	Units		
High	£7,700	900		
Low	<u>£6,200</u>	<u>400</u>		
Difference	£1,500	÷ 500	=	£3 per unit

Using £3 per unit, we then calculate the variable part of the cost for 400 units:

$$£3 \times 400 = £1,200$$

But the total cost for 400 units is £6,200

Therefore the fixed part (which is the same for any number of units)

$$= £6,200 - £1,200 = £5,000$$

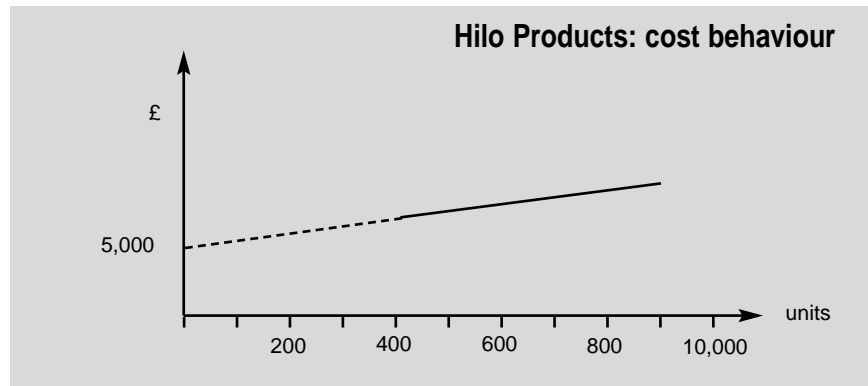
We can now check the solution by calculating the total cost for 900 units, using our answers:

$$\begin{aligned} \text{Total cost} &= \text{Fixed cost} + (\text{variable cost per unit} \times \text{number of units}) \\ &= £5,000 + (£3 \times 900) \end{aligned}$$

$$= \text{£}5,000 + \text{£}2,700$$

$$= \text{£}7,700 \text{ which agrees with the original data.}$$

The following graph illustrates the behaviour of the total cost in this Case Study. The variable cost per unit determines the gradient (slope) of the line, and the fixed cost is shown where the line cuts the vertical axis. The total costs for 650 units and 800 units lie exactly on the line, but in some cases the points between the high and low may not fit exactly. The high-low method still gives useful information provided that the cost behaviour is approximately semi-variable – that is provided that all the points are approximately in a straight line.



Now check your understanding of this subject by reading through the summary below and following through the practical example on the next page.

high-low method summary

- 1 identify the highest and lowest cost totals and their levels of activity
- 2 calculate the difference between the two cost totals
- 3 calculate the difference in cost units between the two levels of activity
- 4 divide the difference in cost by the difference in units: this gives the variable cost per unit
- 5 use the variable cost per unit to calculate the variable part of one of the cost totals
- 6 deduct the variable part from the cost total to obtain the fixed part
- 7 check the answers by using them to calculate the other cost total, which should agree with the given data

practical worked example**required**

Calculate the fixed and variable parts of the semi-variable cost which behaves as follows:

Total cost for 6,400 units is £136,000

Total cost for 9,900 units is £162,250

solution

■	Only two levels are given, high and low		
■	Difference in total cost	= £162,250 - £136,000	= £26,250
■	Difference in number of units	= 9,900 - 6,400	= 3,500
■	Variable cost per unit	= £26,250 ÷ 3,500	= £7.50
■	Variable part for 6,400 units	= £7.50 x 6,400	= £48,000
■	Fixed part	= £136,000 - £48,000	= £88,000
■	Check your answer	£88,000 + (£7.50 x 9,900)	= £162,250

The high-low method is used in the preparation of flexed budgets, because once the fixed cost and the variable cost per unit have been calculated, the total semi-variable cost for any level of activity (within a suitable range) can be found.

For example, if we require the total cost for 7,300 units in the worked example above, it is calculated as:

$$\begin{aligned}
 \text{Total cost} &= \text{fixed cost} + (\text{variable cost per unit} \times \text{number of units}) \\
 &= £88,000 + (£7.50 \times 7,300) \\
 &= £88,000 + £54,750 \\
 &= £142,750
 \end{aligned}$$

We will now look at a Case Study which shows how a cost can be analysed to see if it is variable or semi-variable.

Case Study

CHOCO LIMITED: VARIABLE OR SEMI-VARIABLE COSTS?

Choco Ltd is a chocolate manufacturer. The original budget for Choco Ltd's boxes of chocolates was set at a sales volume of 25,000 boxes. There is to be no change in the level of stock of finished goods, and therefore production is also planned to be 25,000 units.

After the original budget was prepared, a revised forecast of demand showed that

20,000 boxes were likely to be sold. A revised budget for 20,000 boxes to be produced and sold was therefore prepared. The following is an extract from the two budgets:

Budget	Original	Revised
Number of boxes	25,000	20,000
Direct Materials (£)	26,250	21,000
Direct Labour (£)	90,000	81,000

required

Given that the direct costs are either variable or semi-variable, calculate for each type of cost:

- the variable cost per box
- the fixed part of the cost, if any

solution

- Since two budgets have been prepared, we can establish whether the direct costs are strictly variable.

For **Direct Materials**, we calculate the cost per unit in the original budget:

$$£26,250 \div 25,000 = £1.05$$

If it is a variable cost, then the revised budget should show the same unit cost:

$$£21,000 \div 20,000 = £1.05$$

Alternatively: test that the total cost varies in line with production by checking that $£26,250 \times 20,000 \div 25,000$ gives £21,000.

Direct materials is therefore a variable cost. The amount per unit is constant and the total varies in line with production.

Direct materials cost is £1.05 per box.

- For **Direct Labour Cost**

$£90,000 \div 25,000$ (from the original budget) is not the same as

$£81,000 \div 20,000$ (from the revised budget).

Alternatively: $£90,000 \times 20,000 \div 25,000$ does *not* give £81,000.

Direct Labour does *not* vary in line with production and it is *not* a variable cost. From the given information, Direct Labour cost is therefore semi-variable.

- Using the **high-low method**:

	Cost		Boxes	
High	£90,000		25,000	
Low	£81,000		20,000	
Difference	£9,000	÷	5,000	= £1.80 per box

Variable cost per box	= £9,000 ÷ 5,000	= £1.80 per box
Variable cost for 20,000 boxes	= £1.80 x 20,000	= £36,000
Fixed cost = total cost for 20,000 boxes minus variable cost for 20,000 boxes	= £81,000 - £36,000	= £45,000
Check for 25,000 boxes: £45,000 + (1.80 x 25,000)		= £90,000.

Therefore the cost of Direct Labour in Choco Ltd's budgets is made up of £45,000 of fixed costs, plus a variable cost of £1.80 per box.

PREPARATION OF FLEXED OR FLEXIBLE BUDGETS

The Case Studies in this chapter so far have shown how we can analyse and use information about how costs behave. This will enable budgets to be adjusted for different levels of activity. A budget for one specific level of activity is referred to as 'fixed'.

A budget adjusted for a change in level of activity is called a 'flexed' or 'flexible' budget, which is more suitable if actual results are to be compared with budgets for the purposes of performance measurement, because it would mean that the comparison is of 'like with like'.

In order to prepare a flexible budget for costs, we need sufficient information to be able to calculate, for each element of cost:

- the variable cost per unit of activity
- the total fixed part of the cost

Some costs may be entirely variable or entirely fixed. For those which are semi-variable, the high-low method can be used if we have enough data. Once the costs have been analysed in this way, a budget can be prepared for any level of activity.

The cost behaviour identified may only apply within a relevant range, however, and therefore it may not be realistic to 'flex' the budget for very large changes in level of activity.

A flexed budget is useful for preparing a performance report, where the actual costs and income are compared with the flexed budget applicable to the actual level of activity. Differences are shown in a 'variance' column, labelled as adverse or favourable. This form of report gives meaningful variances and is more acceptable to the person responsible for the budget. Look back at the practical example on page 312.

preparing a flexible budget

To produce a flexible budget for the required level of activity, the total for each element of cost is calculated using:

- total variable cost = variable cost per unit x number of units
- total fixed cost remains unchanged
- total semi-variable cost =
Fixed part of cost + variable cost per unit x number of units
- if, in a given case, there are any additional fixed costs which are incurred at certain levels of activity, or any step costs, these must be set at the correct level for the activity level of the flexed budget

Case Study

MAC LIMITED: BUDGETED COSTS

Mac Ltd manufactures a single product – a raincoat – using automated processes. The costs of production are budgeted, as shown in the table below, for output of 20,000 units per year and for 30,000 units per year.

Direct Labour consists of machine operatives' wages and the total wages behave as a step cost:

Output	Total Direct Labour
Up to 15,000 units	£20,000
Over 15,000 and up to 25,000 units	£35,000
Over 25,000 and up to 35,000 units	£50,000

Mac Limited: Budgeted Production Costs			
Output (units)	20,000	27,000	30,000
	£000s	£000s	£000s
Direct Material	140		210
Direct Labour	35		50
Machine running costs	90		110
Other production overheads	100		100
Total Production Cost	365		470

required

Complete the Budgeted Production Costs table by calculating the budgeted costs for Mac Ltd for output of 27,000 units. Note that Direct Labour is the only step cost.



solution

Mac Limited: Budgeted Production Costs			
Output (units)	20,000	27,000	30,000
	£000s	£000s	£000s
Direct Material ^{W1}	140	189	210
Direct Labour ^{W2}	35	50	50
Machine running costs ^{W3}	90	104	110
Other production overheads ^{W4}	100	100	100
Total Production Cost	365	443	470

working notes

(see working note references in the table above)

W1 Direct Material is a variable cost:

$$£140,000 \div 20,000 = £210,000 \div 30,000 = £7$$

Therefore Direct Material = £7 per unit and £7 x 27,000 = £189,000.

W2 Direct Labour is a step cost, as given, and for 27,000 units it would be at the level of £50,000.

W3 Machine running costs are semi-variable, because they do not change in line with output. Using the high-low method:

	Cost	Units	
High	£110,000	30,000	
Low	£90,000	20,000	
Difference	£20,000	÷ 10,000	= £2 per unit

$$\text{Fixed cost} = £90,000 - (£2 \times 20,000) = £50,000$$

$$\text{Total cost for 27,000 units} = £50,000 + (£2 \times 27,000) = £104,000$$

W4 Other production overheads are fixed at £100,000.

The purpose of a flexed budget is shown in the Case Study which follows. This Case Study is similar to an examination task. A performance report which compares actual results with a fixed budget is given, and this has to be revised to compare the actual results with a flexible budget for the actual output. The revised version is a better report because it compares like with like, and more clearly presents the relevant information to management.

The Case Studies that follow include the calculation of variances (differences) between budgeted and actual figures. If the actual cost figure is greater than the budget the variance is 'adverse' (A). If the actual cost figure is less than the budget the variance is 'favourable' (F).

Case Study

PP PLC:
A FLEXED BUDGET

PP plc is a manufacturer of photocopying machines, and one of its divisions (Casings Division) makes the outer casings for the machines. The casings are not sold to external customers, only transferred at cost to another division of PP plc, where they are fitted to the machines. The demand for casings therefore depends on the total production of photocopiers in PP plc.

Last year, Casings Division prepared two provisional budgets because there was uncertainty about how many casings would be required. These two budgets are shown below. They have been prepared on a consistent basis which would apply to any level of demand from 11,500 to 15,000 casings.

Casings Division provisional budgets: 12 months to 30 September 2003

Volume (number of casings)	12,000	15,000
	£	£
Material	138,000	172,500
Labour	76,000	85,000
Power and Maintenance	32,400	36,000
Rent, Insurance and Depreciation	70,000	70,000
Total cost	<u>316,400</u>	<u>363,500</u>

After these budgets were prepared, Casings Division was told that 12,000 casings would be required, so the first budget above was used as the budget for the year.

During the year ended 30 September 2003, PP plc actually required only 11,800 casings from Casings Division and a performance statement for the year for the division was then produced, as shown below. It shows the differences between budgeted total costs and actual total costs in the 'variance' column.

Casings Division performance statement: 12 months to 30 Sept 2003

	Budget	Actual	Variance	
Volume (number of casings)	12,000	11,800		
	£	£	£	
Material	138,000	136,500	1,500	F
Labour	76,000	74,000	2,000	F
Power and Maintenance	32,400	32,400	zero	-
Rent, Insurance and Depreciation	70,000	70,500	500	A
Total cost	<u>316,400</u>	<u>313,400</u>	<u>3,000</u>	F

Note: F=Favourable, A=Adverse



required

- Task 1** Using the data given in the two provisional budgets, calculate the fixed and variable cost elements for each of the four types of cost.
- Task 2** Using your answers to Task 1, prepare an amended performance statement based on flexible budgeting. Show a flexed budget compared with the actual results to give the (revised) variances.

solution

Task 1

Initial analysis of the two provisional budgets shows that Materials cost is variable, Labour is semi-variable, Power and Maintenance is semi-variable, and Rent, Insurance and Depreciation cost is fixed. (The instruction to calculate the fixed and variable cost elements implies that each cost is assumed to have one of these cost behaviour patterns).

workings

■ **Material** (variable)

$$£138,000 \div 12,000 = £172,500 \div 15,000 = £11.50 \text{ per casing}$$

■ **Labour** (semi-variable), using the high-low method:

$$\text{Difference in cost} = £85,000 - £76,000 = £9,000$$

$$\text{Difference in units} = 15,000 - 12,000 = 3,000$$

$$\text{Variable cost} = £9,000 \div 3,000 = £3.00 \text{ per casing}$$

$$\text{Fixed cost} = \text{Total in first budget} - \text{Variable cost of 12,000 casings}$$

$$= £76,000 - (£3.00 \times 12,000)$$

$$= £76,000 - £36,000$$

$$= £40,000$$

■ **Power and Maintenance** (semi-variable), using the high-low method:

$$\text{Difference in cost} = £36,000 - £32,400 = £3,600$$

$$\text{Difference in units} = 15,000 - 12,000 = 3,000$$

$$\text{Variable cost} = £3,600 \div 3,000 = £1.20 \text{ per casing}$$

$$\text{Fixed cost} = \text{Total in first budget} - \text{Variable cost of 12,000 casings}$$

$$= £32,400 - (£1.20 \times 12,000)$$

$$= £32,400 - £14,400$$

$$= £18,000$$

■ **Rent, Insurance and Depreciation** (fixed), does not change with the level of activity and remains as £70,000.

Note that the calculations for the semi-variable costs can be set out in a table. (This form of table may be required in solutions to examination tasks and can be expanded to include costs which are entirely variable or entirely fixed. It could be set up as a spreadsheet – see Chapter 8, page 256).

Casings Division: analysis of semi-variable costs						
	1st budget (low)	2nd budget (high)	Difference	Unit variable cost	Total variable cost (1st budget)	Fixed cost
Volume	12,000	15,000	3,000			
	£	£	£	£	£	£
Labour	76,000	85,000	9,000	3.00	36,000	40,000
Power & Maintenance	32,400	36,000	3,600	1.20	14,400	18,000

Task 2 - solution

The solution can be set out in table format, firstly to calculate the flexed budget and then to present the report. (The budget can be flexed to 11,800 casings as this is within the relevant range).

Calculation of flexed budget for 11,800 casings				
	Unit variable cost £	*Total variable cost £	Fixed cost £	**Flexed budget £
Material	11.50	135,700	-	135,700
Labour	3.00	35,400	40,000	75,400
Power & Maintenance	1.20	14,160	18,000	32,160
Rent, Insurance & Depreciation	-	-	70,000	70,000
Total	15.70	185,260	128,000	313,260

Note that, for each type of cost:

* Total variable cost = Unit variable cost x 11,800

** Flexed budget = Total Cost = Total Variable Cost + Fixed Cost

Casings Division performance statement: 12 months to 30 September 2003			
Comparison with flexed budget for 11,800 casings			
	Flexed budget £	Actual cost £	Variance £
Material	135,700	136,500	800 A
Labour	75,400	74,000	1,400 F
Power & Maintenance	32,160	32,400	240 A
Rent, Insurance & Depreciation	70,000	70,500	500 A
Total	313,260	313,400	140 A
Note: A = Adverse, F = Favourable			

flexible budgets in marginal costing

The format of marginal costing operating statements is shown in Chapter 1. As flexible budgets involve separating the fixed and variable parts of costs, they can easily be shown in marginal costing format if required. The variable costs are listed first (including variable overheads) and the fixed costs (which may include direct costs) are then grouped together. The Case Study that follows demonstrates this and is similar to part of an examination task. The high-low method is not used because the information is given in a different way.

Case Study

TT LIMITED: MARGINAL COSTING

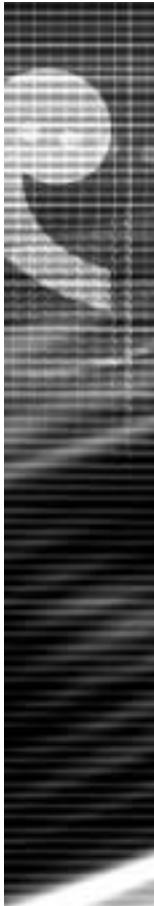
TT Ltd produces a single chemical product, TCH, which cannot be stored as work-in-progress or finished goods for technical reasons. For the year ended 31 August 2003, the budget was for 10,000 litres of TCH to be produced and sold, but the actual production and sales for the period amounted to 11,000 litres. An operating results statement, with attached notes, is shown below.

TT Ltd Operating results for the year ended 31 August 2003

	Budget		Actual	
Volume (litres of TCH)	10,000		11,000	
	£	£	£	£
Turnover		450,000		489,500
Direct costs:				
Material	80,000		90,200	
Production labour	95,000		98,000	
Power	<u>46,500</u>		<u>45,700</u>	
	221,500		233,900	
Fixed overheads	<u>130,000</u>		<u>126,400</u>	
Cost of sales		<u>351,500</u>		<u>360,300</u>
Operating profit		<u>98,500</u>		<u>129,200</u>

Notes

- 1 There are no opening or closing work-in-progress or finished goods.
- 2 The cost of direct material is a variable cost.
- 3 The cost of direct production labour is a fixed cost, because the employees are paid a fixed wage. The employees available are sufficient to produce up to 12,000 litres of TCH.



- 4 The cost of power is semi-variable and the fixed part of the cost allowed for in the budget is £30,000. However, the fixed part of the actual cost is £27,660, due to re-negotiation of the contract with the power company.

required

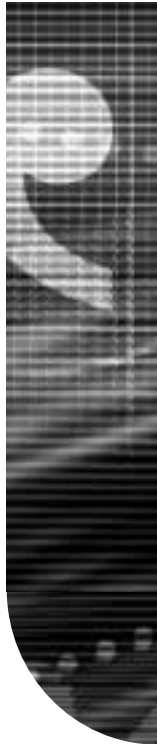
Calculate the following:

- 1 the budgeted unit selling price
- 2 the budgeted material cost per litre of TCH
- 3 the budgeted marginal cost (variable cost) of power
- 4 the actual marginal cost of power
- 5 prepare a marginal costing operating results statement, comparing the actual results with a flexible budget for 11,000 litres and showing the variances
- 6 explain briefly why the revised operating results statement is different from the original one, and state one advantage of flexible budgeting

solution

- 1 The budgeted unit selling price is $£450,000 \div 10,000 = £45$ per litre.
- 2 The budgeted material cost per litre is $£80,000 \div 10,000 = £8$
- 3 The total budgeted cost of power is £46,500, of which £30,000 is fixed (note 4). Therefore the variable part of the cost is £16,500 for 10,000 litres.
The budgeted marginal cost of power is therefore $£16,500 \div 10,000 = £1.65$ per litre of TCH.
- 4 The total actual cost of power is £45,700, of which £27,660 is fixed. Therefore the actual marginal cost of power is $£(45,700 - 27,660) \div 11,000 = £1.64$ per litre of TCH.
- 5 The answer is shown in the following table, using the above answers to calculate the variable costs for 11,000 litres. Marginal costing format is used.

TT Ltd Flexible budgeting results statement for the year ended 31 August 2003					
Litres of TCH	Flexible budget		Actual results		Variance
	11,000		11,000		
	£	£	£	£	-
Turnover ^{W1}		495,000		489,500	<u>5,500</u> A
Marginal costs:					
Material ^{W2}	88,000		90,200		2,200 A
Power ^{W3}	<u>18,150</u>		<u>18,040</u>		<u>110</u> F
Total marginal costs		<u>106,150</u>		<u>108,240</u>	<u>2,090</u> A
Contribution		388,850		381,260	7,590 A
Fixed costs					
Direct Labour	95,000		98,000		3,000 A
Power ^{W4}	30,000		27,660		2,340 F
Overheads	<u>130,000</u>		<u>126,400</u>		<u>3,600</u> F
Total fixed costs		<u>255,000</u>		<u>252,060</u>	<u>2,940</u> F
Operating Profit		133,850		129,200	4,650 A



workings notes to the table

Note these use answers 1 to 4:

W1 Budget = £45 x 11,000 and actual is as given. (Note that the sales variance is Adverse when actual turnover is less than budget).

W2 Budget = £8 x 11,000 and actual is as given.

W3 Budget = £1.65 x 11,000 and actual is £45,700 - £27,660 or £1.64 x 11,000

W4 Fixed part of the power costs are as given. Fixed overheads are also given.

solution (continued)

6 The revised operating results statement is different from the original one because the costs have been separated into their fixed and variable parts. A flexed budget for 11,000 litres can then be prepared, to show what the results should have been for this level of output and sales. This is not the same as the original budget because the budgeted turnover and some of the budgeted costs depend on the number of litres. This is emphasised by the marginal costing layout. The budgeted profit is higher than the original one, because there are more litres of TCH to contribute to the fixed costs and profit.

The revised statement has the advantage that the comparison is more meaningful when we compare like with like, i.e. both budget and actual figures are applicable to 11,000 litres of TCH.

This report presents relevant, useful information in a clear format.

comparison of marginal and absorption costing

In the last Case Study, there were no opening or closing stocks of finished goods, so that the units of production and units sold were equal. In the next Case Study below, we have the situation that sales volume is less than production volume. Hence, there is an increase in the level of finished goods stocks over the period. As has been seen in Chapter 1, this will mean that the methods of absorption costing and marginal costing will report different profit figures in this period. A combination of flexible budgeting with marginal and absorption costing and changes in stock levels has been used in the Examinations.

Case Study



LIDDEAN LIMITED: FLEXIBLE BUDGETING

Liddean Ltd makes and sells a single product, the Lidd. The original budget for Liddean Ltd for the 6 months ended 30 September 2003 planned for production and sales volumes to be equal, both being 12,500 Lidds. The actual results for the period were that 12,000 Lidds were produced and only 10,000 sold. Opening stock of Lidds was zero and therefore the closing stock was 2,000 Lidds. The budgeted and actual figures are given below, together with attached notes.

Liddean Ltd: Operating results for 6 months ending 30 September 2003

	Budget	Actual
Sales volume (Lidds)	12,500	10,000
Production volume (Lidds)	<u>12,500</u>	<u>12,000</u>
	£	£
Sales	312,500	260,000
Less: Cost of Sales:		
Direct costs:		
Materials	62,500	72,000
Labour	81,250	75,000
Overheads:		
Production overheads	<u>58,000</u>	<u>52,000</u>
Total production cost of sales	201,750	199,000
Selling overheads	<u>42,500</u>	<u>20,000</u>
Total cost of sales	<u>244,250</u>	<u>219,000</u>
Profit	<u>68,250</u>	<u>41,000</u>

Notes

- Direct materials and direct labour are both variable costs.
- Production overheads are semi-variable. For the fixed part, the budget is based on £8,000 for this level of activity. However, for production volume below 12,200 Lidds, the budgeted fixed production overhead would be £6,000. The actual fixed production overhead was in line with the budget.
- Selling overheads are semi-variable. The budget for the fixed part is £5,000. The remainder varies in relation to sales volume. The actual fixed selling overhead was in line with the budget.
- There were no stocks of work-in-progress and no opening stocks of finished goods.
- To calculate the actual cost of sales in the statement above, the closing stocks were valued at actual production cost. The number of Lidds was used to apportion the actual production costs between the cost of sales and the closing stock. Using this policy, the composition of the production cost of sales and closing stock was:

	Closing Stock	Cost of Sales	Cost of Production
Number of units (Lidds)	2,000	10,000	12,000
	£	£	£
Direct material	14,400	72,000	86,400
Direct labour	15,000	75,000	90,000
Production overhead	<u>10,400</u>	<u>52,000</u>	<u>62,400</u>
Production cost	<u>39,800</u>	<u>199,000</u>	<u>238,800</u>



required

- 1 Calculate the following:
 - (a) the budgeted selling price per Lidd
 - (b) the budgeted direct material cost per Lidd
 - (c) the budgeted direct labour cost per Lidd
 - (d) the budgeted marginal cost of production overhead
 - (e) the actual marginal cost of production overhead
 - (f) the budgeted marginal cost of selling overhead
 - (g) the actual marginal cost of selling overhead

- 2 Prepare a flexible budget statement for the operating results of Liddean Ltd for the 6 months to 30 September 2003, using marginal costing. Identify the fixed costs for the period and show any variances.

- 3 Write a memo to the production manager of Liddean Ltd, explaining:
 - why the revised operating statement which you have prepared shows different results from the original statement
 - why the revised operating statement may be an improvement on the original statement for the purpose of measuring performance.

solution:

- 1 The calculations are as follows:
 - (a) budgeted selling price = $\text{£}312,500 \div 12,500 = \text{£}25$ per Lidd.
 - (b) budgeted direct material cost = $\text{£}62,500 \div 12,500 = \text{£}5$ per Lidd.
 - (c) budgeted direct labour cost = $\text{£}81,250 \div 12,500 = \text{£}6.50$ per Lidd.
 - (d) budgeted marginal (variable) cost of production overhead = $\text{£}(58,000 - 8,000) \div 12,500 = \text{£}4$ per Lidd.
The $\text{£}8,000$ budgeted fixed part is deducted before dividing by the number of units.
 - (e) actual marginal cost of production overhead = $\text{£}(62,400 - 6,000) \div 12,000 = \text{£}4.70$ per Lidd.
Notice that this is using the cost of production and the number of Lidds produced. NB. also the reduced fixed part for reduced production (see notes)
 - (f) Budgeted marginal cost of selling overhead = $\text{£}(42,500 - 5,000) \div 12,500 = \text{£}3$ per Lidd.
 - (g) Actual marginal cost of selling overhead = $\text{£}(20,000 - 5,000) \div 10,000 = \text{£}1.50$ per Lidd sold.
Notice that the number of Lidds sold is used because the variable part of selling overhead depends on sales volume (see notes)

- 2 Using marginal costing, and the answers calculated above, we can then present the results as shown in the table on the next page.

Liddean Ltd: Flexible budgeting results statement for 6 months to 30 Sept. 2003					
	Flexible budget		Actual results		Variance
Lidde sold	10,000		10,000		-
	£	£	£	£	£
Sales ^{W1}		250,000		260,000	10,000 F
Marginal costs:					
Material ^{W2}	50,000		72,000		22,000 A
Labour ^{W3}	65,000		75,000		10,000 A
Production overhead ^{W4}	<u>40,000</u>		<u>47,000</u>		<u>7,000</u> A
Variable production cost of sales	155,000		194,000		39,000 A
Variable selling overhead ^{W5}	<u>30,000</u>		<u>15,000</u>		<u>15,000</u> F
Total variable costs		<u>185,000</u>		<u>209,000</u>	<u>24,000</u> A
Contribution		65,000		51,000	14,000 A
Fixed costs ^{W6}					
Production overhead		6,000		6,000	- -
Selling overhead		<u>5,000</u>		<u>5,000</u>	<u>- -</u>
Operating profit		<u>54,000</u>		<u>40,000</u>	<u>14,000</u> A

Working notes to the table

- W1** Budget = £25 x 10,000 and actual is as given
- W2** Budget = £5 x 10,000 and actual is as given in table in notes (variable cost)
- W3** Budget = £6.50 x 10,000 and actual is as given in table (variable cost)
- W4** Budget = £4 x 10,000 and actual = £4.70 x 10,000, using answers 1(d) and 1(e)
- W5** Budget = £3 x 10,000 and actual = £1.50 x 10,000, using answers 1(f) and 1(g))
- W6** Fixed costs are in line with budget and the budget for fixed production overhead has been reduced because production is below 12,200 Lidders.

3 MEMORANDUM

To: Production Manager
 From: Cost accountant
 Date: 14 October 2003
 Subject: Operating results for the 6 months to 30 September 2003.

Comparison of the attached operating results statements shows that there are differences between the way the actual profit is reported and the variances calculated. The reasons for the differences are:



- 1 In the original statement, results for sales of 10,000 Lidds and closing stock of 2,000 Lidds were compared with a budget for sales of 12,500 Lidds and zero closing stock
- 2 In the original statement the cost of sales had been calculated by using average cost of production to value the closing stock. This included an element of fixed production overhead. In the revised statement closing stock has been valued at variable cost of production only and fixed costs for the period have been kept separate.
- 3 There is a difference of £1,000 between the reported actual profit of £41,000 in the original statement and the reported actual profit of £40,000 in the revised statement. This amount is due to the fixed cost element which was included in the closing stock in the original statement and which would be carried forward rather than charged against the period. This can be calculated as $\text{£}6,000 \div 12,000 = \text{£}0.50$ per Lidd, for 2,000 Lidds.
 $\text{£}0.50 \times 2,000 = \text{£}1,000$, the difference in reported profit.
- 3 The reason why the revised statement is preferable for performance measurement is as explained in the first point above. Comparison of like with like gives more meaningful results. Also, marginal costing emphasises which costs change when the level of activity changes, and which remain fixed. Fixed costs are often related to time periods and marginal costing charges them to the time period. The report presents the required information in a clear and easy-to-use format.

ACTIVITY BASED BUDGETING

The process of preparing budgets can be carried out using any costing method. The last two Case Studies have compared the use of marginal costing with absorption costing.

Activity Based Budgeting means that

budgets are prepared using the principles of Activity Based Costing.

Activity Based Costing is described in Chapter 1 (see page 12). It involves identifying activities which are being carried out in the organisation, and, for each activity, the cost driver. If Activity Based Budgeting is to be used, decisions need to be made, as part of the planning process, as to the amount of each activity that will be required, and the funds to be allocated to it.

The analysis of cost behaviour here is just as important as in marginal and absorption costing. In Activity Based Budgeting and Costing, the behaviour of costs is defined in terms of the cost drivers, because these are the factors which cause costs to change. The Case Studies on pages 14 and 15 of Chapter 1 show calculations of budgeted costs using Activity Based Costing and you may find it useful to review these now that you have studied methods of budgeting in more detail.

LIFE CYCLE BUDGETING

The method of life cycle costing is described in Chapter 5, which relates to Unit 8 (see pages 154-159). You may find it useful to read that section at this point, bearing in mind your studies of planning and budgeting.

Life cycle budgeting involves planning for costs and revenues over the whole life cycle of a product or service. Estimated sales demand at different selling prices may be considered. (See the Case Study Aerocar plc on page 157, which illustrates how forecasts of life cycle costs and income can be used in planning). Using life cycle budgeting means planning for all costs from the start of research and development to the end of all support for the product or service.

MANAGEMENT REPORTING ASPECTS OF BUDGETING

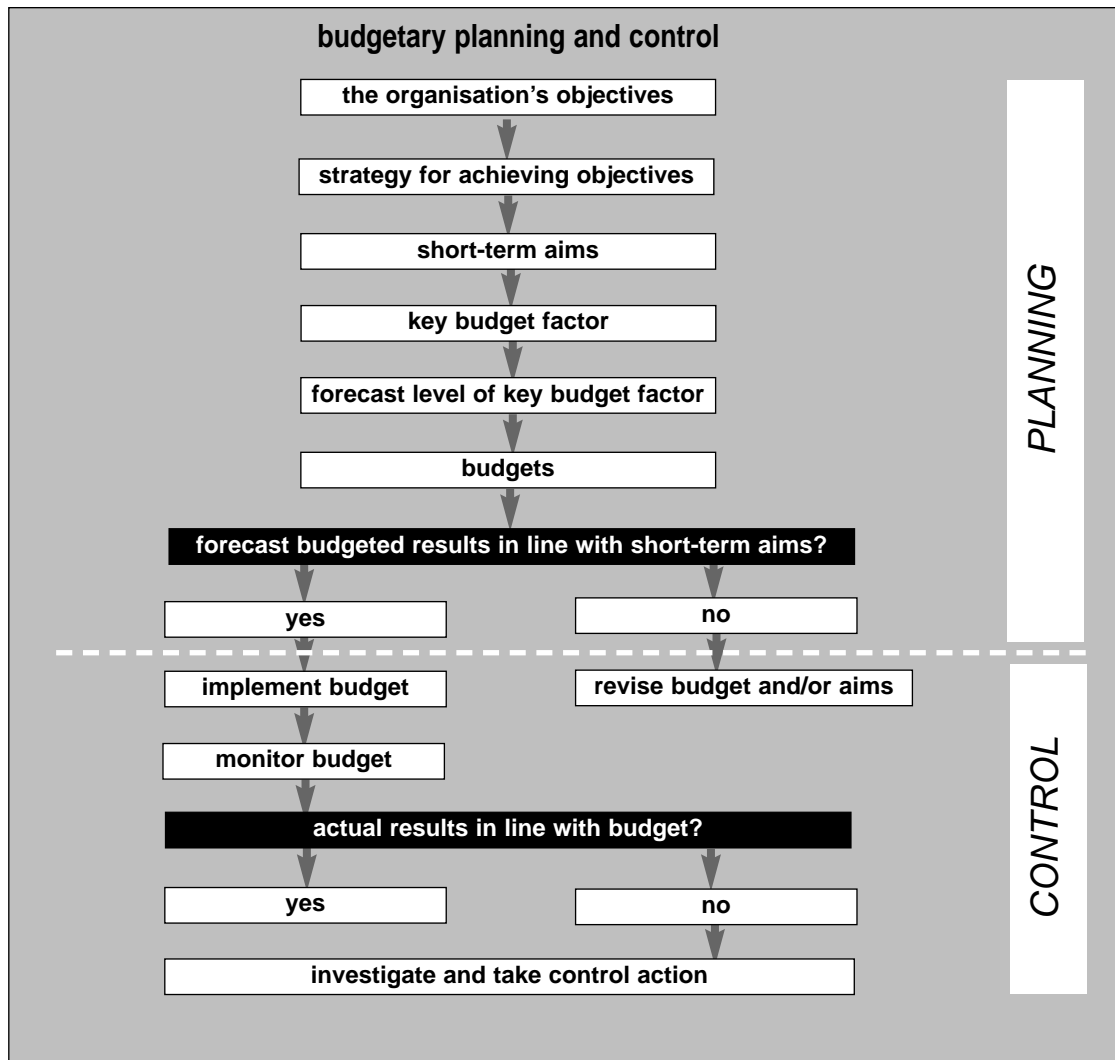
budgetary planning and control

The last three Case Studies in this chapter show how variances can be calculated by comparing the actual results of an organisation with its budget, usually flexed to give a budget for the actual level of activity. This is an important aspect of a budgetary system. The preparation of budgets is part of the planning process, the comparison with actual results is part of the control process, as shown in the diagram below. (Compare the 'planning' part of this diagram with 'The initial process' in Chapter 8 [page 249]. The 'control' part links with 'Interpreting Variances' in Unit 8, Chapter 4 [page 113]).

implementation of budgets

The budget for a large organisation cannot be 'implemented' (put into practice), without being broken down into sections corresponding to departments or 'budget centres'. The manager of a budget centre is the 'budget holder' responsible for implementing the department's budget. (See page 357).

The diagram on the next page gives a brief summary of a very complex process. Each step on the diagram represents a great deal of work involving many people. Good communication is essential at every stage. Those who will be expected to implement the budget should have the opportunity to raise queries and obtain explanations about plans and forecasts. Budget proposals should be presented to them in a clear and useful form in order to maintain their goodwill and obtain their agreement. Unless the budget holders understand and accept the budget, they will not be motivated to work to it. We will look at these aspects of budgeting again in Chapter 11.



monitoring of budgets

'**Monitoring**' the budget involves regular comparisons of actual results with budget, so that control action can be taken if necessary. The **budget period**, which is the period of time for which the budget is prepared, is usually six months or a year, but monitoring should take place more frequently than this. Waiting until the end of the budget period would give out-of-date information, too late for action.

The '**control period**' is the part of a budget period for which budgeted and actual results are compared. The control period could be a week or a month, for example, depending on the type of work.

The 'variance' column in the performance reports shown in this chapter shows the sales variance and each of the total cost variances.

feedback

Feedback is information obtained and reported after comparing the budgeted and actual results for a control period.

Feedback is used to determine the necessary control action if results are significantly different from the budget. What is meant by 'significantly different'? This would have to be decided in advance. It could be defined in terms of absolute amounts or percentages of the budget, that is, 'control limits' would be set.

Only when the feedback shows variances going beyond the control limits would they be reported for action to be taken by the appropriate person. This is called 'exception reporting', which has the advantage that only the 'significant' differences are brought to the attention of management, thus saving time and avoiding the risk of important figures being lost among a mass of data.

You may find it useful to refer to the section on Interpreting Variances in Unit 8, Chapter 4, where these principles are explained in detail (see page 111).

favourable variances

It is often thought that only adverse variances are significant, but **favourable** variances which are **beyond the control limits** are equally important and may require action to be taken.

The word 'favourable' is perhaps misleading because it suggests something good. Favourable variances may indeed indicate some advantageous situation which it would be useful to investigate to see if it can be continued, for example efficiency improvements. However, large favourable variances may not be desirable in some cases, for example favourable materials variances may result from using the wrong material or using insufficient material to maintain the quality of a product.

control action

The control action to be taken on receipt of feedback from the monitoring of budgets depends on the situation. The section on Interpreting Variances in Chapter 4 is relevant again here (see page 111).

If the reason for the variance can be identified it may be possible to correct it, in order to bring the actual results for the next control period back in line with (or at least closer to) the budget. The **feedback loop** is shown in the diagram on page 339 (this is an extended version of the diagram on page 336). The feedback loop is an important part of the Budgetary Control process.

Sometimes it is not possible to bring the actual results back in line with the budget, because there has been a permanent change in costs which is not

controllable by the managers of the organisation. This could be due to external factors, such as national wage agreements or permanent price changes (increases or reductions). The action to be taken then involves adjusting the budget to plan for realistic costs, so that the feedback from the next control period is more meaningful. This brings us to the idea of feeding forward information.

feedforward

Feedforward is information about the current performance of an organisation and its environment which is used in budgeting for the future.

The budgeting process, introduced in Chapter 8, starts from identifying the organisation's objectives and translating these into desired results for the budget period. For example, if the long-term objective is to achieve a particular level of market share, the short term aim can be expressed in terms of budgeted sales volume.

In a feedforward system, the initial budget is considered by looking at the results it is expected to achieve in comparison with the desired results. This process uses information about the current performance of the organisation (feedback) and information about the economic environment, together with the budget.

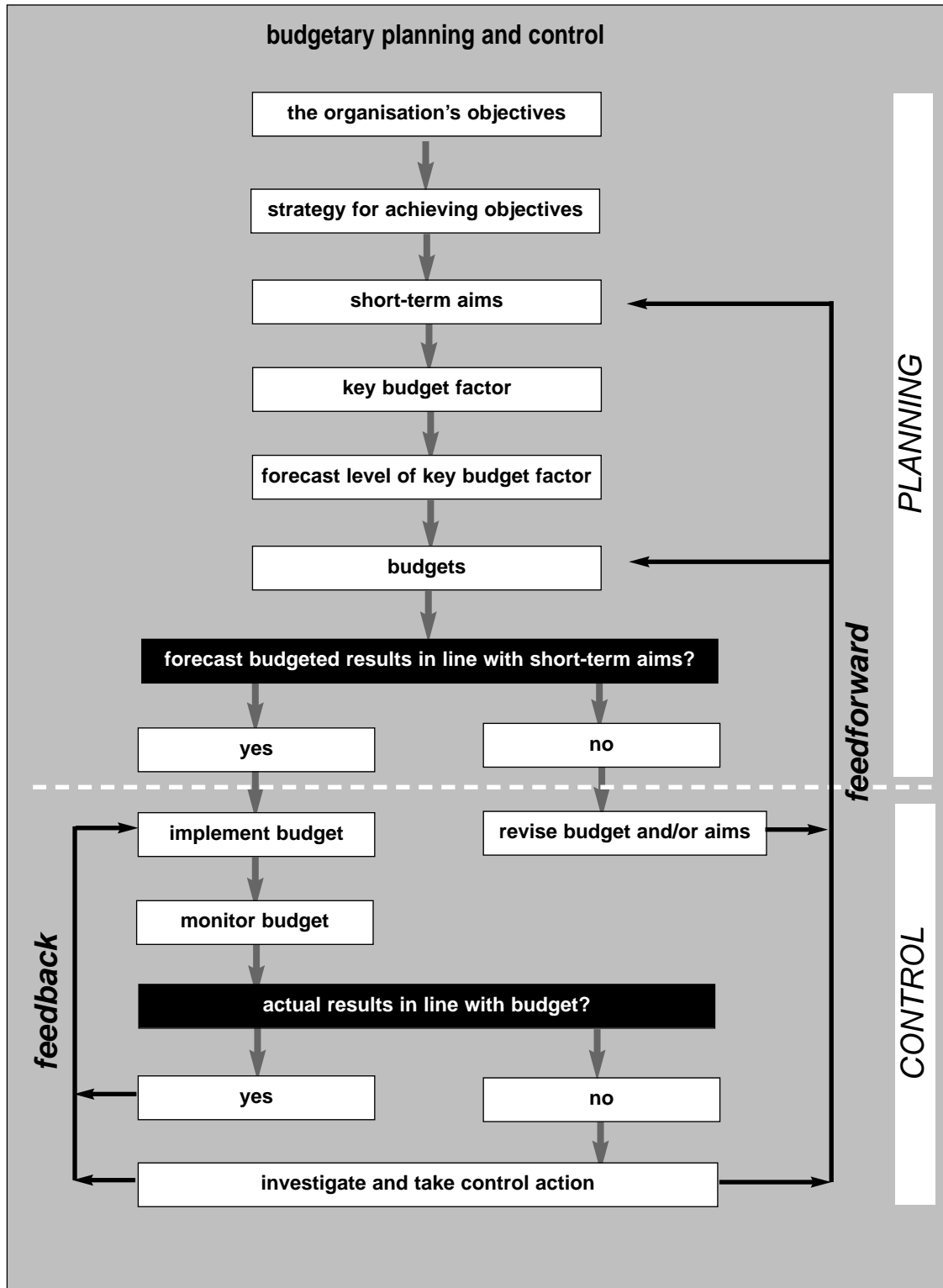
If the forecast results, according to the budget, are significantly different from the desired results, then the budget may be amended to eliminate the differences. However, the organisation's aims and objectives may have to be re-considered and brought closer to what is achievable. In either case, a revised budget and/or revised objectives should help to ensure that future results do meet the organisation's objectives.

The feedforward loop is shown on the diagram on the next page. Notice that the feedforward loop takes information to the Budgetary Planning process for the *next* period.

performance reports

Performance reports based on budgets should be produced regularly to show the results of each control period, possibly together with accumulated figures for 'the year to date'. The case studies in this chapter illustrate some formats of performance reports. The usefulness of a report depends on its clear presentation of relevant information.

Reports which compare budgeted and actual results usually give variances. The original fixed budget may be shown as well as a flexible budget, the flexible budget being used for the calculation of variances. If control limits are known, then the variances which should be investigated can be highlighted. Significant variances should be discussed with budget holders and other managers, so that remedial action can be taken.



Case
StudyTT LIMITED:
PERFORMANCE REPORTING**required**

In the results statement for TT Ltd shown below, identify which variances should be investigated if:

- (a) control limits are set as \pm £2,500, or
 (b) control limits are set as \pm 3% of budget

TT Ltd Flexible budgeting results statement for the year ended 31 August 2003					
Litres of TCH	Flexible budget		Actual results		Variance
	11,000		11,000		
	£	£	£	£	£
Turnover		495,000		489,500	<u>5,500</u> A
Marginal costs:					
Material	88,000		90,200		2,200 A
Power	<u>18,150</u>		<u>18,040</u>		<u>110</u> F
Total marginal costs		<u>106,150</u>		<u>108,240</u>	<u>2,090</u> A
Contribution		388,850		381,260	7,590 A
Fixed costs					
Direct Labour	95,000		98,000		3,000 A
Power	30,000		27,660		2,340 F
Overheads	<u>130,000</u>		<u>126,400</u>		<u>3,600</u> F
Total fixed costs		<u>255,000</u>		<u>252,060</u>	<u>2,940</u> F
Operating Profit		133,850		129,200	4,650 A

solution:

(a) The variances which are greater than \pm £2,500 are:

- the sales variance (adverse)
- the contribution variance (adverse), partly due to the sales variance
- the direct labour variance (adverse)
- the fixed overhead variance (favourable)
- the operating profit variance (adverse), which results from the other variances

Reasons for the difference in profit should be identified by investigating the most significant sales and cost variances.

(b) The variances which are greater than 3% of budget (using the flexible budget), are:

- the direct labour variance (3.2% of budget, adverse)
- the fixed cost power variance (7.8% of budget, favourable)
- the operating profit variance (3.5%, adverse), which results from the other variances

Reasons for the difference in profit should be identified by investigating the most significant sales and cost variances.

format of budgets and reports

It is essential that any statement or report is designed to give **useful information to management**, (see also Chapter 1). This applies to draft budget proposals, agreed budget statements and all forms of performance reports. The particular lay-out and headings used will depend on the **information requirements** of managers. They will also depend on the method of costing being used, and whether detailed standard costs are set.

The clear presentation of management information is illustrated in the Case Studies throughout this book. For example, in Chapter 4, detailed variance reports are prepared, and in this chapter budgets and performance statements have been produced.

In Examination Case Studies you may be expected to comment on the headings and groupings of costs and income which you consider would give the most useful information in a budget or performance report for a particular manager in a given organisation. This involves identifying what should be highlighted in the report in relation to the organisation's objectives, taking into account the area of responsibility of the manager.

Chapter 11 includes discussion of the levels of authority and responsibility of managers and what is meant by 'controllability' of costs and incomes. We will then return to the question of how to design or improve the format of a budget or report in order to show useful, relevant information as required by managers.

Chapter Summary

- Three methods of budgeting which can be applied in different situations are incremental budgeting, zero base budgeting (ZBB) and programme based budgeting.
- For budgeting, it is important to have information about how costs behave in relation to levels of activity. This is particularly relevant to the preparation of flexible budgets. A fixed budget is one which is prepared for a specific level of activity, whereas a flexed or flexible budget is one which allows for a change in the level of activity.
- The types of cost behaviour studied for the purposes of preparing flexed budgets are variable costs, fixed costs, step costs and semi-variable costs.
- To calculate semi-variable costs for different levels of activity, we analyse them into their fixed and variable parts using the high-low method.
- After splitting all the costs into their fixed and variable parts, a flexible budget can be prepared by calculating the costs and income at the required level of activity.
- A budget which is flexed to the actual level of activity is suitable to use for comparison with actual costs and income, because it compares like with



like. The comparison, giving the variances, is shown in a 'performance report' or 'operating results statement'.

- Budgets, operating statements and performance reports can be presented using any method of cost accounting, in particular marginal and absorption costing.
- Marginal and absorption costing may report different profit figures in a given period when there is a difference between the levels of opening and closing stocks of finished goods. Absorption costing reports a higher profit in a period when stocks are built up, because fixed costs absorbed into the stock increase are carried forward into the next period.
- Activity Based Budgeting refers to budgeting using the principles of Activity Based Costing (see Chapter 1). Life Cycle Costing can be used in budgeting.
- Throughout the budgetary process, good communication with budget holders is essential to maintain their goodwill and obtain their acceptance of the budget.
- After a budget has been prepared and implemented, it is used for control purposes by comparing the actual results with the budget, investigating significant differences and taking appropriate control action. The information being used in this process is called feedback.
- Budgets are used to make detailed plans which should be in line with the organisation's objectives. If the forecast results from the initial budget differ from the desired results, either the budget or the objectives may be amended. The information being used is called feedforward.
- The importance of clear presentation leads to a consideration of features which should be included in the format of budgets and performance reports in order to ensure that they provide useful information for managers (see also Chapter 1 and Chapter 11).

Key Terms

incremental budgeting	a method of budgeting in which budgets are based on the previous period's budgets, updated for developments and inflation
zero base budgeting	a method of budgeting in which budgets are set to zero at the start of each period – budgets for proposed activities are then judged and prioritised in relation to the organisation's objectives, and funds allocated accordingly
programme based budgeting	a method of budgeting applicable to non-profit-making organisations, in which funds are allocated to programmes designed to achieve the organisation's objectives, up to the highest level possible with funds available.

fixed budget	a budget which is set for a particular level of activity
flexed (or flexible) budget	a budget which is adjusted to allow for changes in costs (and income) resulting from a change in the level of activity
variable cost	a cost which behaves such that its total varies in proportion to the level of activity <i>Total variable cost = (cost per unit x number of units)</i>
fixed cost	a cost which behaves such that its total remains unchanged when the level of activity changes (within a relevant range)
relevant range	the range of levels of activity within which a certain pattern of cost behaviour applies
step cost	a cost which behaves such that its total changes in steps as the level of activity reaches certain points, remaining unchanged between these points
semi-variable cost	a cost which is such that its total is made up of a part which is variable and a part which is fixed. <i>Total semi-variable cost = Fixed cost + (variable cost per unit x number of units)</i>
marginal costing	a costing system which uses a cost for each unit of output based purely on the variable (or 'marginal') costs – all fixed costs are regarded as time based and are therefore linked to accounting periods rather than units of output
budget period	the period of time for which a budget is prepared
control period	the part of a budget period after which budgeted and actual results are compared
feedback	information obtained and reported after comparing the budgeted and actual results for a control period – feedback is used to determine necessary control action if results show significant differences from the budget
feedforward	information about the current performance of an organisation and its environment which is used in budgeting for the future – a feedforward system attempts to ensure that future results will meet the organisation's objectives

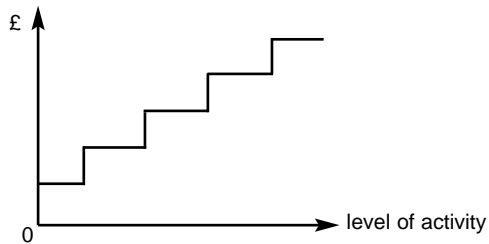
Student Activities

10.1 Which one of the following is a feature of an incremental budget?

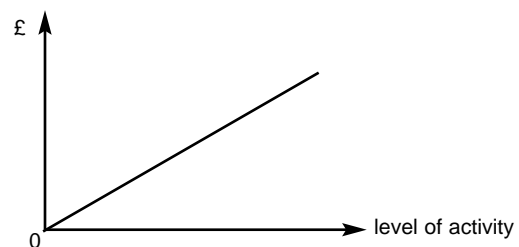
- (a) all budgets are initially set at zero
- (b) it is based on the previous year's budget initially
- (c) it remains fixed and is not updated for inflation
- (d) it is based on specific organisational programmes

10.2 The following graphs show total costs against level of activity. Identify the type of cost behaviour illustrated by each graph.

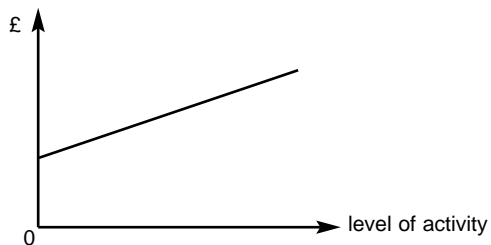
(a)



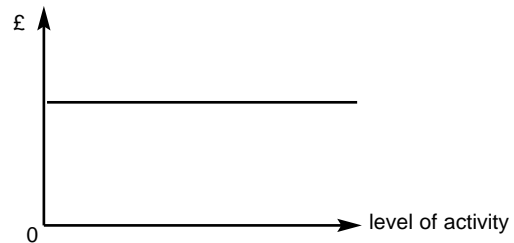
(b)



(c)



(d)



10.3 For this task, assume that the cost of power is a semi-variable cost.

(a) Using the high-low method, calculate the fixed cost and the variable cost per unit for power from the following data:

Month	Total cost of power	Level of activity
1	£51,000	90,000 units produced
2	£43,000	70,000 units produced
3	£59,000	110,000 units produced

(b) Using your answers to (a), calculate the expected total cost of power if 80,000 units are produced.

10.4 Budgets are prepared for the transport costs of the fleet of vehicles run by a local authority. The level of activity is measured on mileage and the original budget for the year to 31 March 2003 was set on the basis of an annual mileage of 350,000 miles. Due to uncertainty about the number of contracts to be serviced by the transport fleet, it was then decided to prepare two further budgets, for 250,000 miles and 300,000 miles respectively. Each element of cost is assumed to behave in one of three ways:

- Entirely fixed
- Entirely variable
- Semi-variable

Required

Complete each of the two tables given below. The first table gives the original budget and one of the flexed budgets. The other flexed budget is to be prepared. The second table gives the actual results for the actual mileage of 300,000 miles. The appropriate flexed budget figures are to be inserted and the variances calculated.

Transport Fleet Flexible Budgets for the year to 31 March 2003			
Budgeted annual mileage	250,000	300,000	350,000
	£000s	£000s	£000s
Running costs	37.5		52.5
Maintenance of vehicles	29.0		39.0
Vehicle licences	24.0		24.0
Insurance	10.0		10.0
Garaging	12.5		12.5
Depreciation	40.0		40.0
Total costs	153.0		178.0
Cost per mile (to nearest 1p)	£0.61		£0.51

Transport Fleet Operating Results for the year to 31 March 2003			
	Budget	Actual	Variance
Annual mileage		300,000	
	£000s	£000s	£000s
Running costs		51.5	
Maintenance of vehicles		33.0	
Vehicle licences		24.0	
Insurance		11.0	
Garaging		12.3	
Depreciation		40.0	
Total costs		171.8	
Cost per mile (to nearest 1p)		£0.57	

- 10.5** A photographer acquired the rights to reproduce, frame and sell a set of historic prints. It was decided to budget for this new activity and record the results separately from the remainder of the business.

The forecast costs for the first year were:

Copying costs: £5.00 per print.

Mounting and framing costs: £22.00 per print.

Power costs are expected to be semi-variable and by comparison with similar existing processes are expected to be:

£175 per month if 300 prints per month are produced

£225 per month if 500 prints per month are produced.

Power costs are to be included in Production Cost.

Other costs related to this activity are expected to be fixed at:

- £1,000 per month for administration
- £2,500 per month for advertising.

The selling price per print has been set at £50.

The forecast for sales and production of prints in the first year is 400 prints per month. Opening stocks of finished prints are zero and the planned closing stock at the year end is also zero.

Required

Task 1

(The workings and answers for this task, together with further information, will be used for Task 2 below).

Using the forecast of 400 prints per month, prepare two alternative formats of the budget for the first year of the historic print activity, on:

- (a) an absorption cost basis
- (b) marginal cost basis

Further information

The actual results for the first year were as follows:

- Opening stock of finished prints was zero
- Closing stock of finished prints was 500 prints
- 4,000 prints were produced in the year
- 3,500 prints were sold in the year
- Actual sales revenue = £157,500
- Actual costs of production were:
 - Copying costs = £20,000
 - Mounting and framing costs = £84,000
 - Power costs = £1,700 (the fixed part was as budgeted).
- Actual administration costs were £1,300 per month
- Actual advertising costs were £2,000 per month.

Task 2

Using your answers to task 1 and the actual results, prepare two alternative performance statements comparing the actual results for the year with a flexed budget, on

- (a) An absorption cost basis, where closing stock (in both the flexed budget and the calculation of actual profit) is valued on the basis of the average budgeted production cost per print.
- (b) A marginal cost basis where closing stock (in both the flexed budget and the calculation of actual profit) is valued on the basis of variable budgeted production cost.

Hint: care must be taken when you are given a mixture of monthly and yearly data.