The Institute of Finance Management
Accounting and Finance Department
Lecture Notes
Budgetary Planning and Control
BACC 3 and BAIT 3
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Learning aims

Students should be able to

- Evaluate the nature of budgetary control system
- Evaluate the objectives of budgetary control system
- Prepare functional budget, master budget, fixed budget, flexible budget
- Select and explain appropriate budgetary system for an organization

1.1 Introduction

Budgeting is a method of communicating the goals of the organization to the appropriate managers in order to facilitate, coordinate and control various sections of the organization so that the desired outcomes are achieved. Budgeting has come to be accepted as an efficient method of short-term planning and control.

The technique of budgeting is an important application of Performance Management. Probably, the greatest aid to good management that has ever been devised is the use of budgets and budgetary control. It is an important tool and has assisted managers cope with many problems facing their organization such as inflation.

1.2 Definition of Budget

A budget is a quantitative plan prepared for a specific time period. It is normally expressed in financial terms and prepared for one year.

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1.3 Basic Features of a Budget

An analysis of the above said definitions reveal the following essentials of a budget:

- It is prepared for a definite future period.
- It is a statement prepared prior to a defined period of time.
- The Budget is monetary and *I* or quantitative statement of policy.
- The Budget is a predetermined statement and its purpose is to attain a given objective.

A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organization.

1.4 Objectives of a Budget

A budget has the following functions/ purpose

- **Planning:** A budgeting process forces a business to look to the future. This is essential for survival since it stops management from relying on ad hoc or poorly coordinated planning.
- **Control:** Actual results are compared against the budget and action is taken as appropriate.
- **Communication:** The budget is a formal communication channel that allows junior and senior managers to converse.
- **Coordination:** The budget allows coordination of all parts of the business towards a common corporate goal
- **Evaluation:** Responsibility accounting divides the organization into budget centres, each of which has a manager who is responsible for its performance. The budget may be used to evaluate the actions of a manager within the business in terms of the costs and revenues over which they have control.
- **Motivation:** The budget may be used as a target for managers to aim for. Reward should be given for operating within or under budgeted levels of expenditure. This acts as a motivator for managers.
- **Authorization:** The budget acts as a formal method of authorization to a manager for expenditure, hiring staff and the pursuit of plans contained within the budget
- **Delegation:** Managers may be involved in setting the budget. Extra responsibility may motivate the managers. Management involvement may also result in more realistic targets.

1.5 Budgetary Controls

Budgetary Control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary Control is a system which uses budgets as a means of planning and controlling

The above definitions reveal the following essentials of budgetary control:

- Establishment of objectives for each function and section of the organization
- Comparison of actual performance with budget
- Ascertainment of the causes for such deviations of actual from the budgeted performance
- Taking suitable corrective action from different available alternatives to achieve the desired objectives

1.5.1 Objectives of Budgetary Control

Budgetary Control is planned to assist the management for policy formulation, planning, controlling and co-coordinating the general objectives of budgetary control and can be stated in the following ways:

- **Planning**: A budget is a plan of action. Budgeting ensures a detailed plan of action for a business over a period of time.

- **Co-ordination**: Budgetary control co-ordinates the various activities of the entity or organization and secure co-operation of all concerned towards the common goal.
- **Control:** Control is necessary to ensure that plans and objectives are being achieved. Control follows planning and co-ordination. No control performance is possible without predetermined standards. Thus, budgetary control makes control possible by continuous measures against predetermined targets

1.5.2 The Fundamental of Effective Budgetary Control

The following are the requisites/ essential that should exist in order to have effective budgetary control

- Clear cut objectives and goals should be well defined
- A budget should always be related to a specified time period.
- There should be a budget manual which contains all details regarding plan and procedures for its execution. It should also specify the time table for budget preparation for approval, details about responsibility, cost centres
- Support of top management is necessary in order to get the full support and co-operation of the system of budgetary control.
- To make budgetary control successful, there should be a proper delegation of authority and responsibility.
- Adequate accounting system is essential to make the budgeting successful.
- The employees should be properly educated about the benefits of budgeting system.
- The budgeting system should not cost more to operate than it is worth.
- Key factor or limiting factor, if any, should consider before preparation of budget.
- For budgetary control to be effective, proper periodic reporting system should be introduced.

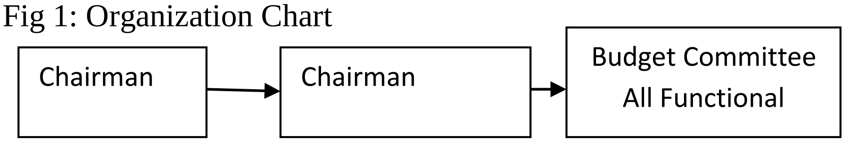
1.5.3 Organization for Budgetary Control

In order to introduce budgetary control system, the following are essential to be considered for a sound and efficient organization. The important aspects to be considered are:

1. Organization Chart
2. Budget Centre
3. Budget Officer
4. Budget Committee
5. Budget Manual
6. Budget Period
7. Key Factor

1. **Organization Chart**: For the aim of effective and efficiency budgetary control, it important for each organization to have definite "plan of organization." This plan of organization is defined in the organization chart. The organization chart describes clearly the position of each manager authority and responsibility of the firm. All the functional heads are entrusted with the responsibility of ensuring proper implementation of their respective departmental budgets. An organization chart for budgetary control is given showing clearly the type of budgets to be prepared by the functional heads.

Fig 1: Organization Chart



From the above chart we can observe that the chairman of the company is the overall in charge of the functions of the Budgeted Committee. A Budget Officer is the convener of the budget committee, who helps in co-ordination. The Purchase Manager, Production Manager, Sales Manager, Personnel Manager, Finance Manager and Account Manager are made responsible to prepare their budgets. From the above chart we can observe that the chairman of the company is the overall in charge of the functions of the Budgeted Committee. A Budget Officer is the convener of the budget committee, who helps in co-ordination. The Purchase Manager, Production Manager, Sales Manager, Personnel Manager, Finance Manager and Account Manager are made responsible to prepare their budgets.

2. **Budget Centre:** is a section of the organization of an undertaking defined for the purpose of budgetary control. For effective budgetary control budget centre or departments should be established for each of which budget will be set with the help of the head of the department concerned

3. **Budget Officer**: is usually some senior member of the accounting staff who controls the budgetary process. He does not prepare the budget himself, but facilitates and co-ordinates the budgeting activity. He assists the individual departmental heads and the budget committee, and ensures that their decisions are communicated to the appropriate people.

4. **Budget Committee**: comprising of the chief executive and all functional heads. The main objective of this committee is to agree on all departmental budgets. In small concerns, the Budget Officer may co-ordinate the work for preparation and implementation of budgets. In large-scale concern a budget committee is setup for preparation of budgets and execution of budgetary control.

5. **Budget Manual**: is a document which set out the responsibilities of persons engaged in the routine of and the forms and records required for budgetary control. It contains all details regarding the plan and procedures for its execution. It also specifies the time table for budget preparation to approval, details about responsibility, cost centers, constitution and organization of budget committee, duties and responsibilities of budget officer.

6. **Budget Period**: A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors:

   - Types of Business
   - Types of Budget

- Nature of the demand of the product
- Length of trade cycle
- Economic factors
- Availability of accounting period
- Availability of finance
- Control operation

7. **Key Facto**r is also called as "Limiting Factor" or Governing Factor. While preparing the budget, it is necessary to consider key factor for successful budgetary control. The influence of the Key Factor which dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfillment. The Key Factors include.
    - Raw materials may be in. short supply.
    - Non-availability of skilled labours
    - Government restrictions
    - Limited sales due to insufficient sales promotion
    - Shortage of power
    - Underutilization of plant capacity
    - Shortage of efficient executives
    - Management policies regarding lack of capital
    - Insufficient research into new product development
    - Insufficiency due to shortage of space

1.5.4 Advantages of Budgetary Control

The advantages of budgetary control may be summarized as follows:

- It facilitates reduction of cost.
- Budgetary control guides the management in planning and formulation of policies.
- Budgetary control facilitates effective co-ordination of activities of the various departments and functions by setting their limits and goals.
- It ensures maximization of profits through cost control and optimum utilization of resources.
- It evaluates for the continuous review of performance of different budget centres.
- It helps to the management efficient and economic production control.
- It facilitates corrective actions, whenever there are inefficiencies and weaknesses comparing actual performance with budget.
- It guides management in research and development.
- It ensures economy in working.
- It helps to adopt the principles of standard costing.

1.5.5 Limitations of Budgetary Control

Budgetary Control is an effective tool for management control. However, it has certain important limitations which are identified below:

- If the budget plans are made on the basis of inaccurate forecasts then the budget progamme may not be accurate and ineffective.

- Effective implementation of budgetary control depends upon willingness, co-operation and understanding among people reasonable for execution, Lack of co-operation leads to inefficient performance.
- Budgeting may be cumbersome and time consuming process.

1.6 Types of Budgets

As budgets serve different purposes, different types of budgets have been developed. The following are the different classification of budgets developed on the basis of time, functions, and flexibility or capacity.

1.6.1 Classification on the basis of Time:

1. **Long-Term Budgets**: are budgets prepared for a longer period varies between five to ten years. It is usually developed by the top level management. These budgets summaries the general plan of operations and its expected consequences.

2. **Short-Term Budgets**: These budgets are usually prepared for a period of one year. Sometimes they may be prepared for shorter period as for quarterly or half yearly. The scope of budgeting activity may vary considerably among different organization.

3. **Current Budgets**: Current budgets are prepared for the current operations of the business. As per ICMA London, "Current budget is a budget which is established for use over a short period of time and related to current conditions."

1.6.2 Classification according to Functions:

1. **Functional Budget**: The functional budget is one which relates to any of the functions of an organization. The number of functional budgets depends upon the size and nature of business. The following are the commonly used:
   - **Sales Budget** is one of the important functional budgets. Sales estimate is the commencement of budgeting may be made in quantitative terms. Sales budget is primarily concerned with forecasting of what products will be sold in what quantities and at what prices during the budget period. Sales budget is prepared by the sales executives taking into account number of relevant and influencing factors such as

   - **Production budget** is usually prepared on the basis of sales budget. But it also takes into account the stock levels desired to be maintained. The estimated output of business firm during a budget period will be forecast in production budget. The production budget determines the level of activity of the produce business and facilities planning of production so as to maximum efficiency. The production budget is prepared by the chief executives of the production department
   - **Cost of Production Budget**: after Preparation of production budget, this budget is prepared. Production Cost Budgets show the cost of the production determined in the production budget. Cost of Production Budget is grouped in to Material Cost Budget, Labour Cost Budget and Overhead Cost Budget. Because it breaks up the cost of each product into three main elements material, labour and overheads. Overheads may be further subdivided in to fixed and variable cost

- **Cash Budget**: This budget represent the anticipated receipts and payment of cash during the budget period. The cash budget also called as Functional Budget. Cash budget is the most important of the entire functional budget because; cash is required for the purpose to meeting its current cash obligations. If at any time, a concern fails to meet its obligations, it will be technically insolvent. Therefore, this budget is prepared on the basis of detailed cash receipts and cash payments. The estimated Cash Receipts include:
    - Cash Sales
    - Credit Sales
    - Collection from Sundry Debtors
    - Bills Receivable
    - Interest Received
    - Income from Sale of Investment
    - Commission Received
    - Dividend Received
    - Income from Non-Trading Operations etc.

    The estimated Cash Payments include the following :
    - Cash Purchase
    - Payment to Creditors
    - Payment of Wages
    - Payments relate to Production Expenses
    - Payments relate to Office and Administrative Expenses
    - Payments relate to Selling and Distribution Expenses
    - Any other payments relate to Revenue and Capital Expenditure
    - Income Tax Payable, Dividend Payable etc.

2. **Master Budget**: When the functional budgets have been completed, the budget committee will prepare a Master Budget for the target of the concern. Accordingly a budget which is prepared incorporating the summaries of all functional budgets. It comprises of budgeted profit and loss account, budgeted balance sheet,

1.6.3 Classification on the basis of Capacity:

1. **Fixed Budget**: A budget is drawn for a particular level of activity is called fixed budget. Fixed budget is a budget which is designed to remain unchanged irrespective of the level of activity actually attained. Fixed budget is usually prepared before the beginning of the financial year. This type of budget is not going to highlight the cost variances due to the difference in the levels of activity. Fixed Budgets are suitable under static conditions.

2. **Flexible Budget:** is a budget which is designed to change in accordance with the level of activity actually attained. According to the principles that guide the preparation of the flexible budget a series of fixed budgets are drawn for different levels of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come into use for solving the problems caused by the application of the fixed budget

Advantages of Flexible Budget

- In flexible budget, all possible volume of output or level of activity can be covered.
- Overhead costs are analyzed into fixed, variable and semi-variable costs.
- Expenditure can be forecasted at different levels of activity.
- It facilitates at all times related factor can be compared which are essential for intelligent decision making.
- A flexible budget can be prepared with standard costing or without standard costing depending upon What the Company opts for.
- Flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and Quotations.
- It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business.

Method of Preparing Flexible Budget

1. **Multi-Activity Method**: This method involves preparing a budget in response to different level of activity. The different level of activity or capacity levels are shown in Horizontal Columns, and the budgeted figures against such levels are placed in the Vertical Columns. The expenses involved in production as per budget are grouped as fixed, variable and semi variable.

2. **Ratio Method**: According to this method, the budget is prepared first showing the expected normal level of activity and the estimated variable cost per unit at the side expected level of activity in addition to the fixed cost as estimated. Therefore, the expenses as per budget, allowed for a particular level of activity attained, will be calculated on the basis of the following formula: Budgeted fixed cost + (Variable cost per unit of activity x Actual unit of activity)

1.7 Three Level Budgets

For every value which is subject to uncertainty three estimates are made. The three estimates may be for

1. The worst possible level
2. The most likely level
3. The best possible level

1.8 Budgets and performance management

Budgets contribute to performance management by providing benchmarks against which to compare actual results (through variance analysis), and develop corrective measures. They take many forms and serve many functions, but most provide the basis for : Budgets give managers "preapproval" for execution of spending plans, and allow them to provide forward looking guidance to investors and creditors. For example, budgets are necessary to convince banks and other lenders to extend credit. Even in a small business, an robust business plan/budget can often result in anticipating and avoiding disastrous outcomes.
Medium and larger organizations invariably rely on budgets. This is equally true in businesses, government, and not for profit organizations. The budget provides a formal quantitative expression of expectations. It is an essential facet of the planning and control process. Without a budget, an organization will be highly inefficient and ineffective.

- Detailed sales targets
- Staffing plans
- Production
- Cash investment and borrowing
- Capital expenditure

1.9 The performance hierarchy

1. Strategic planning is long term, looks at the whole organisation and defines resource requirements. For example, to develop new products in response to changing customer needs.
2. Tactical planning is medium term, looks at the department / divisional level and specifies how to use resources. For example, to train staff to deal with the challenges that this new product presents.
3. Operational planning is very short term, very detailed and is mainly concerned with control. Most budgeting activities fall within operational planning and control. For example, a budget is set for the new product to include advertising expenditure, sales forecasts, labour and material expenditure etc

The aim is that if a manager achieves short term budgetary targets (operational plans) then there is more chance of meeting tactical goals and ultimately success for strategic plans.

1.10 Behavioural aspects of budgeting

Individuals react to the demands of budgeting and budgetary control in different ways and their behaviour can damage the budgeting process. Behavioural problems are often linked to management styles, and include dysfunctional behaviour and budget slack.

1.11 Setting the difficulty level of a budget

Budgetary targets will assist motivation and appraisal if they are at the right level.

- An expectations budget is a budget set at current achievable levels. This is unlikely to motivate managers to improve but may give more accurate forecasts for resource planning, control and performance evaluation.
- An aspirations budget is a budget set at a level which exceeds the level currently achieved. This may motivate managers to improve if it is seen as attainable but may also result in an adverse variance if it is too difficult to achieve. This must be managed carefully.

Question 1

A manager is awarded a bonus for achieving monthly budgetary targets. State three possible behavioural implications of this policy, what should be done to try to improve the process?

Solution
The manager may try to:
Delay discretionary short term expenditure, e.g. maintenance, at the expense of long term performance to improve results
Manipulate results to make sure the relevant targets are achieved
Incorporate budgetary slack into the targets to make them easier to achieve.

The process can be improved by measuring performance against a variety of targets

1.12 Approaches to budgeting

There are a number of different budgetary systems:

- Top down vs bottom up budgeting
- Incremental budgeting
- Zero based budgeting (ZBB)
- Rolling budgets
- Activity based budgeting
- Feed forward control

1.12.1 Top down and bottom up budgeting

- A top down budget is a budget that is set without allowing the ultimate budget holder to have the opportunity to participate in the budgeting process.
- A bottom up budget is a system of budgeting in which budget holders have the opportunity to participate in setting their own budgets. Also called participative budgeting

Advantages of bottom up budgets

- Increased motivation due to ownership of the budget
- Should contain better information since employees most familiar with the department set the budget
- Increases manager's understanding and commitment
- Better communication between departments
- Senior managers can concentrate on strategy

Disadvantages of bottom up budgets

- Senior managers may resent loss of control
- Dysfunctional behaviour: budgets may not be in line with corporate objectives as managers lack a strategic perspective and will focus on divisional concerns
- Bad decisions from inexperienced managers
- Budget preparation is slow and disputes can arise
- Budgetary slack: managers set targets that are too easy to achieve

Question 2
Bottom up budgeting is generally seen as preferable because it leads to improved managerial motivation and performance. However, there are situations for which top down budgeting is preferable.

Describe three situations where top down budgeting would be more applicable.

Solution
Operational managers may not have the knowledge and experience to set a budget. For example, in a small business only the owner may be involved in all aspects of the business and may therefore set the budget
In times of crisis there may be insufficient time to set a participative budget and targets may have to be imposed to ensure survival
Participation has to be genuine for it to result in improved motivation

1.12.2. Incremental Budgets
An incremental budget starts with the previous period's budget or actual results and adds (or subtracts) an incremental amount to cover inflation and other known changes. It is suitable for stable businesses, where costs are not expected to change significantly. There should be good cost control and limited discretionary costs.

Advantages of incremental budgets
- Quickest and easiest method
- Suitable if the organization is stable and historic figures are acceptable since only the increment needs to be justified

Disadvantages of incremental budgets
- Builds in previous problems and inefficiencies
- Uneconomic activities may be continued. E.g. the firm may continue to make a component In house when it might be cheaper to outsource.
- Managers may spend unnecessarily to use up their budgeted expenditure allowance this year, thus ensuring they get the same (or a larger) budget next year

Question3
AW Inc produces two products, A and C. In the last year (20X4) it produced 640 units of A and 350 units of C incurring costs of Shs 672,000. Analysis of the costs has shown that 75% of the total costs are variable. 60% of these variable costs vary in line with the number of A produced and the remainder with the number of C. The budget for the year 20X5 is now being prepared using an incremental budgeting approach. The following additional information is available for 20X5:. All costs will be 4% higher than the average paid in 20X4. Efficiency levels will remain unchanged. Expected output of A is 750 units and of C is 340 units.
What is the budgeted total variable cost of products A and C for the full year 20X5?

Solution
Total variable cost **Variable cost per unit**
20X4:
Product A

Shs 672,000 × 75% × 60% = Shs 302,400	Shs 302,000 ÷ 640 units =Shs472.50
Product C Shs 672,000 × 75% × 40% = Shs 201,600	Shs 201,600 ÷ 350 units =Shs576
20X5: Product A Shs 472.50 × 1.04 × 750 units = Shs 368,550	N/A
Product C Shs576 × 1.04 × 340 units = Shs 203,674	N/A

1.12.3 Zero Based budgeting

A 'method of budgeting that requires each cost element to be specifically justified, as though the activities to which the budget relates were being undertaken for the first time. Without approval, the budget allowance is zero' It is suitable for:

- Allocating resources in areas were spend is discretionary, i.e. nonessential. For example, research and development, advertising and training
- Public sector organizations such as local authorities

There are four distinct stages in the implementation of ZBB:

1. Managers should specify, for their responsibility centres, those activities that can be individually evaluated.
2. Each of the individual activities is then described in a decision package. The decision package should state the costs and revenues expected from the given activity. It should be drawn up in such a way that the package can be evaluated and ranked against other packages.
3. Each decision package is evaluated and ranked usually using cost/benefit analysis.
4. The resources are then allocated to the various packages.

Advantages of ZBB

- Inefficient or obsolete operations can be identified and discontinued
- ZBB leads to increased staff involvement at all levels since a lot more information and work is required to complete the budget
- It responds to changes in the business environment
- Knowledge and understanding of the cost behaviour patterns of the organization will be enhanced
- Resources should be allocated efficiently and economically

Disadvantages of ZBB

- It emphasizes short term benefits to the detriment of long term goals

- The budgeting process may become too rigid and the organization may not be able to react to unforeseen opportunities or threats
- The management skills required may not be present
- Managers may feel demotivate due to the large amount of time spent on the budgeting process
- Ranking can be difficult for different types of activities or where the benefits are qualitative in nature

For a number of years, the research division of Z Inc has produced its annual budget (for new and continuing projects) using incremental budgeting techniques. The company is now under new management and the annual budget for 20X4 is to be prepared using ZBB techniques.
Explain how Z Inc could operate a ZBB system for its research projects.

Solution
Stage 1: Managers should specify the activities that can be evaluated
The managers/researchers responsible for each project should decide which projects they wish to undertake in the forthcoming period. These projects will be a mixture of continued projects and new projects.

Stage 2: Each activity is described in a decision package For the projects which have already been started and which the managers want to continue in the next period, we should ignore any cash flows already incurred (they are sunk costs), and we should only look at future costs and benefits. Similarly, for the new projects we should only look at the future costs and benefits.

Stage 3: Each decision package is evaluated and ranked Different ways of achieving the same research goals should also be investigated and the projects should only go ahead if the benefit exceeds the cost.

Stage 4: Resources are allocated to the various packages. Once all the potential projects have been evaluated if there are insufficient funds to undertake all the worthwhile projects, then the funds should be allocated to the best projects on the basis of a cost benefit analysis.

ZBB is usually of a highly subjective nature. (The costs are often reasonably certain, but usually a lot of uncertainty is attached to the estimated benefits.) This can be shown by the example of a research division where the researchers may have their own pet projects, which they are unable to view in an objective light.

1.12.4 Rolling budgets
A budget (usually annual) kept continuously up to date by adding another accounting period (e.g. month or quarter) when the earliest accounting period has expired.
Suitable if:
- Accurate forecasts cannot be made, For example, in a fast moving environment.
- Or for any area of business that needs tight control

Advantages of rolling budgets
- Planning and control will be based on a more accurate budget.

- Rolling budgets reduce the element of uncertainty in budgeting since they concentrate on the short term when the degree of uncertainty is much smaller.
- There is always a budget that extends into the future (normally 12 months)
- It forces management to reassess the budget regularly and to produce budgets which are more up to date.

Disadvantages of rolling budgets

- Rolling budgets are more costly and time consuming than incremental budgets
- May demotivate employees if they feel that they spend a large proportion of their time budgeting or if they feel that the budgetary targets are constantly changing
- There is a danger that the budget may become the last budget 'plus or minus a bit'
- An increase in budgeting work may lead to less control of the actual results Issues with version control, as each month the full year numbers will change
- Confusion in meetings as to each numbers the business is working towards; this can distract from the key issues. As managers discuss which numbers to achieve

1.12.5 Activity Based Budgeting

ABB is defined as: 'a method of budgeting based on an activity framework and utilizing cost driver data in the budget setting and variance feedback processes'. Or, put more simply, preparing budgets using overhead costs from activity based costing methodology.

The advantages of ABB

- It draws attention to the costs of 'overhead activities' which can be a large proportion of total operating costs.
- It recognizes that it is activities which drive costs. If we can control the causes (drivers) of costs, then costs should be better managed and understood.
- ABB can provide useful information in a total quality management (TQM) environment, by relating the cost of an activity to the level of service provided.

Disadvantages of ABB

- A considerable amount of time and effort might be needed to establish the key activities and their cost drivers.
- It may be difficult to identify clear individual responsibilities for activities.
- It could be argued that in the short term many overhead costs are not controllable and do not vary directly with changes in the volume of activity for the cost driver. The only cost variances to report would be fixed overhead expenditure variances for each activity

1.13 Dealing with uncertainty in budgeting

Budgets are open to uncertainty. For example, non controllable factors such as a recession or a change in prices charged by suppliers will contribute to uncertainty in the budget setting process.
There are several techniques available to help deal with uncertainty. These have been discussed before and include:

- Flexible budgets: these are budgets which, by recognizing different cost behaviour patterns, are designed to change as the volume of activity changes. Flexible budgets are prepared under marginal costing principles, and so mixed costs are split into their fixed and variable components. This is useful at the control stage: it is necessary to compare actual results to the actual level of activity achieved against the results that should have been expected at this level of activity which are shown by the flexible budget.

- Rolling budgets: the budget is updated regularly and, as a result, uncertainty is reduced.
- Sensitivity analysis: variables can be changed one at a time and a large number of budgets produced. For example, what would happen if the actual sales volume was only 75% of the budgeted amount?
- Simulation: similar to sensitivity analysis but it is possible to change more than one variable at a time.

1.14 Spreadsheets

A spreadsheet is a computer package which stores data in a matrix format where the intersection of each row and column is referred to as a cell. They are commonly used to assist in the budgeting process.

Advantages of spreadsheets

- Large enough to include a large volume of information
- Formulae and look up tables can be used so that if any figure is amended, all the figures will be immediately recalculated. This is very useful for carrying out sensitivity analysis.
- The results can be printed out or distributed to other users electronically quickly and easily.
- Most programs can also represent the results graphically e.g. balances can be shown in a bar chart:

Disadvantages of spreadsheets:

- Spreadsheets for a particular budgeting application will take time to develop. The benefit of the spreadsheet must be greater than the cost of developing and maintaining it.
- Data can be accidentally changed (or deleted) without the user being aware of this occurring.
- Errors in design, particularly in the use of formulae, can produce invalid output. Due to the complexity of the model, these design errors may be difficult to locate.
- Data used will be subject to a high degree of uncertainty. This may be forgotten and the data used to produce, what is considered to be, an 'accurate' report.
- Security issues, such as the risk unauthorized access (e.g. hacking) or a loss of data (e.g. due to fire or theft).
- Version control issues can arise.
- Educating staff to use spreadsheets / models and which areas /cells to use as inputs can be time consuming.