PGBA (S4) 02-1

Strategic Management Accounting

SEMESTER - IV

BUSINESS ADMINISTRATION

BLOCK - 1

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

Subject Experts

Prof. Nripendra Narayan Sarma, Maniram Dewan School of Management, KKHSOU.
Prof. U. R Dhar, Retd. Professor, Dept of Business Administration, GU.
Prof. Mukulesh Baruah,Director, Assam Institute of Management.

Course Co-ordinator :	Dr. Smritishikha Choudhury, Asst. Prof., KKHSOU
SLM Preparation Team	Dr. Chayanika Senapati, Asst. Prof., KKHSOU

UNITS	**CONTRIBUTORS**
1-7	Ms. Sweta Jalan, NERIM
3	Mr. Geetam Misra

Editorial Team

Content :

1-7	Dr. Devajit Goswami,KKHSOU
Structure, Format & Graphics:	Dr. Smritishikha Choudhury,KKHSOU Dr. Chayanika Senapati, KKHSOU

January, 2019

ISBN :

 This Self Learning Material (SLM) of the Krishna Kanta Handiqui State Open University is made available under a Creative Commons Attribution-Non Commercial-Share Alike 4.0 License (international): http://creativecommons.org/licenses/by-nc-sa/4.0/

Printed and published by Registrar on behalf of the Krishna Kanta Handiqui State Open University.

Headquarters: Patgaon, Rani Gate, Guwahati-781017
City Office: Housefed Complex, Dispur, Guwahati-781006; Web: www.kkhsou.in

The University acknowledges with thanks the financial support provided by the Distance Education Bureau, UGC for preparation of this material.

MASTER IN BUSINESS ADMINISTRATION

STRATEGIC MANAGEMENT ACCOUNTING

Block 1

DETAILED SYLLABUS

Unit 1: **Strategic Management Accounting** **Page No. : 9 – 19**

Evolution of Strategic Management Accounting,Need of Strategic Management Accounting,

Developing the Strategic Management Accounting Process, Elements of Strategic Management Accounting, Scope of Strategic Management Accounting, Advantages of Strategic Management Accounting, Limitations of Strategic Management Accounting

Unit 2: **Strategic Planning and control** **Page No. : 20 – 29**

Definition of Strategic Planning,

Components of Strategic Planning, Strategic Planning Process, Mission and Objectives, Environmental Scanning, Strategy Formulation, Strategy Implementation, Evaluation and Control, Management Control, Operating Control, Differences between Strategy Formulation and Management Control, Distinction between Control Management and task Control.

Unit 3: **Capital budgeting** **Page No. : 30 – 62**

Basic Principles of Capital Budgeting, Capital Budgeting techniques, Capital Budgeting Techniques under Certainty, Non-Discounted Cash Flow Criteria, Discounted Cash Flow Criteria, Comparison of NPV & IRR, Comparison of NPV & PI, Modified Internal Rate of Return (MIRR), Capital Budgeting Techniques under Uncertainty, Statistical Techniques of Risk Analysis, Other techniques

Unit 4: Budgetary Control **Page No. : 63 – 82**

Definition of Budget and Budgetary Control, Characteristics of Good Budgeting, Salient Features of Budgetary Control, Objectives of Budgetary Control, Steps in Budgetary Control, Advantages of Budgetary Control, Limitations of Budgetary Control, Classification of Budgets, Differences between Fixed and Flexible Budget, Cash budget, Performance Budgeting, Zero-Based Budgeting, Solved Problems on Flexible budget and Cash Budget.

Unit 5: Zero Based Budgeting **Page No. : 83 – 89**

Features of Zero-Based Budgeting, Steps in Zero-Based Budgeting, Advantages of Zero-Based Budgeting, Limitations of Zero-Based Budgeting, Process of Zero-Based Budgeting, Differences between Zero-Based Budgeting and Traditional Budgeting

Unit 6: Responsibility Accounting **Page No. : 90 – 105**

Fundamental Aspects of Responsibility Accounting,
Principles of the Responsibility Accounting, Characteristics of Responsibility Accounting, Advantages of Responsibility Accounting, Process of Responsibility Accounting,
Steps involved in Responsibility Accounting, Difficulties encountered in Introducing Responsibility Accounting, Responsibility Centre, Characteristics of Responsibility Centre, Types of Responsibility Centres, Objectives of Responsibility Performance Reporting

Unit 7: Transfer Pricing **Page No. : 106 – 120**

Definition of Transfer Pricing, Features of Transfer Pricing, Need of Transfer Pricing, Objectives of Transfer Pricing, Advantages of Transfer Pricing, Limitations of Transfer Pricing, Transfer Pricing Methods, International Transfer Pricing, Factors Affecting Fixation of Transfer Pricing

COURSE INTRODUCTION

This is the second course of MBA fourth semester Finance specialisation Programme. This course “Strategic Management Accounting” of MBA 4th semester will focus on the different aspects of management accounting. In this course we have briefly discussed about Standard Costing, Budgetary Control, Zero based Budgeting, concept of Capital Budgeting, Responsibility accounting in decentralised organisation, concept of Transfer pricing in decentralised organisation and Traditional financial performance measures.

This course consists of fifteen units. This course starts with the unit discussing the concept of the introduction to Service marketing.

The course has 15 units and is divided into two blocks: Block 1 and Block 2.

Block 1 deals with the introductory concepts of Standard Costing, Budgetary Control, Zero based Budgeting, concept of Capital Budgeting, Responsibility accounting in decentralised organisation, concept of Transfer pricing in decentralised organisation and Traditional financial performance measures.

Block 2 starts with the unit discussing the concept of Managing Productivity. Then we have discussed Balanced Scorecard, Benchmarking, Responsibility centres, Behavioural aspects, Activity Based Costing system, Customer Account Profitability analysis and Product Lifecycle Costing.

Each unit of these blocks includes some along-side boxes to help you know some of the difficult, unseen terms. You may find some boxes marked with: “LET US KNOW”. These boxes will provide you with some additional interesting and relevant information. Again, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PROGRESS” given at the end of each unit. This will help you in making your learning more active and efficient. And, at the end of each section, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check your understanding.

BLOCK INTRODUCTION:

This is the first block of the course “Strategic Management Accounting”. The Block is divided into7 units and is primarily a learner oriented Self learning material, as it satisfies the requirements of the learners in the filed of accounting.

This block comprises of the following seven units:

The first unit introduces us to Meaning and Concept of Standard Costing.

The second unit gives us a broad idea of Budgetary Control.

The third unit gives us an idea on the Zero based Budgeting.

The fourth unit will help us in understanding the concept of Capital Budgeting.

The fifth unit gives us a broad idea of Responsibility accounting in decentralised organisation.

The sixth unit will help us in understanding the concept of Transfer pricing in decentralised organisation.

The seventh and the last unit of this block explains about Traditional financial performance measures.

The Block is devided into seven units:

Unit 1: Standard costing

Unit 2: Budgetary control

Unit 3: Zero-based budgeting

Unit 4: Capital Budgeting

Unit 5: Responsibility Accounting in Decentralized Organization

Unit 6: Transfer Pricing in Decentralized Organization

Unit 7: Traditional Financial performance Measures

UNIT 1: STRATEGIC MANAGEMENT ACCOUNTING

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Evolution of Strategic Management Accounting.

1.4 Need of Strategic Management Accounting

1.5 Developing the Strategic Management Accounting Process.

1.6 Elements of Strategic Management Accounting

1.7 Scope of Strategic Management Accounting

1.8 Advantages of Strategic Management Accounting

1.9 Limitations of Strategic Management Accounting

1.10 Let Us Sum Up

1.11 Answers to Check Your Progress

1.12 Further Reading

1.13 Model Questions

1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define strategic management accounting
- explain the importance of strategic management accounting
- discuss the steps involved in developing the strategic management accounting process
- discuss the elements of strategic management accounting
- discuss the advantages and limitations of strategic management accounting.

1.2 INTRODUCTION

Strategic Management Accounting is an outward looking and future oriented accounting system designed by the management for the flow of information for the formulation, implementation and evaluation of strategy to cope with environmental demands. There are different forms of Strategic

Management Accounting practices. These include competitor accounting, activity based costing, target costing, value chain costing, brand value monitoring, responsibility accounting, transfer pricing, customer account profitability, strategic pricing and strategic costing.

Irrespective of the strategic positioning, the role of strategic management accounting is to provide with relevant, accurate and reliable information on the firm's critical success factors within and outside the organization for a long term period.

Again, management accounting is the base for business strategies to be planned and implemented by the organization. Strategy is the way that a firm positions and distinguishes itself from its competitors.

Ken Simmonds, it is the collection of management accounting information about a business and its competitors for use in developing and monitoring the business strategy.

A strategy is a unified, comprehensive and integrated plan that relates the strategic advantages of the firm to the challenges of the environment. It is designed to ensure that the basic objectives of the enterprise are achieved through proper execution by the organization— (William. F. Gluek). Hence the choice of strategy is so central to the study and understanding of strategic management.

1.3 EVOLUTION OF STRATEGIC MANAGEMENT ACCOUNTING

The system has been grouped into four stages of evolution that were responsive to the progressively familiarity of events and decreasing visibility of the future:

a. Management by control of performance, which was adequate when change was slow.
b. Management by extrapolation, when change accelerated but the future could be predicted by extrapolation of the past.
c. Management by anticipation, when discontinues began to appear but change while rapid, was still slow enough to permit timely anticipation and response.

d. Management through flexible response, which is currently emerging, under conditions in which many significant challenges develop too rapidly to permit timely anticipation.



CHECK YOUR PROGRESS

Q 1: Define Strategic Management Accounting.

.....

.....

Q 2: What are the stages of evolution of Strategic Management Accounting?

.....

.....

1.4 NEED OF STRATEGIC MANAGEMENT ACCOUNTING

Organisations measure both financial and non-financial benefits through strategic management accounting. It considers information which relates to the external factors and internally generated information.

Financial benefits: All organization engages in Strategic Management Accounting looking at the relationship between strategic management and performance evaluation.

Non-financial benefits: Strategic Management is needed to cope with and manage uncertainity in decision making. The following are the non-financial benefits of strategic management accounting:

1. It provides a way to anticipate future problems and opportunities.
2. It provides employees with a clear objectives and directions for the future of the organisation.
3. It results in more effective and better performance compared to non-strategic management organisations.
4. It increases employee satisfaction and motivation
5. It results in faster and better decision making and
6. It results on cost savings.

It offers the following personal benefits:

1. It allows for identification, prioritization and exploitation of opportunities.
2. It provides an objective view of management problems.
3. It minimizes the effects of adverse conditions and changes.
4. It allows more effective allocation of time and resources to identified opportunities.
5. It provides a basic for the clarification of individual responsibilities.
6. It gives encouragement to forward thinking.
7. It gives a degree of discipline and formality to the management of a business.

Finally, Strategic Management Accounting is an integral and important function of organisation life. However successful organisations are successful for using adequate resources and producing good products and services.



CHECK YOUR PROGRESS

Q 3: Mention two non-financial benefits of Strategic Management Accounting.

.....

.....

1.5 DEVELOPING THE STRATEGIC MANAGEMENT ACCOUNTING PROCESS

Frederick.W. Glueck, suggested that strategic planning in many organizations must evolve through four sequential phases:

Phase1: Basic financial planning: Organizations in phase 1 emphasize preparing and meeting annual budgets. Financial targets are established and revenues and costs are carefully monitored. The emphasis is short term and the primary focus is on the functional aspects of the organization.

Phase 2 : Forecast –based planning: Organizations in phase two usually extend the time frames covered by the budgeting process. Managers tend to seek more sophisticated forecasts and to become aware of their

external environment and its effect on their organizations.

Phase 3 : Externally –oriented planning: Phase three is characterized by the attempt to understand basic marketplace phenomena. Organization begins to search for new ways to define and satisfy customer needs. Top Management begins to evaluate strategic alternatives in a formalized manner to planning and actions.

Phase 4 : Strategic Management : Phase four is characterized by the merging of strategic planning and management into a single process. This integrated approach is accomplished through the presence of three elements: Pervasive strategic thinking (managers all levels have learned to think strategically), comprehensive planning process and supportive value system.

It is a further development of management accounting. Strategic management accounting provides information for taking the decisions of long period as well as short period.

1.6 ELEMENTS OF STRATEGIC MANAGEMENT ACCOUNTING

Strategic Management Accounting includes strategic planning, strategic control and decision making. Strategic planning describes the periodic activities undertaken by organizations to cope with changes in their external environments. Strategic planning consists of formulating strategies from which overall plans for implementing the strategy are developed.

Based on Robert Anthony's framework, three types of planning and control are required by organizations:

1. **Strategic Planning and Control:** The process of deciding on changes in organisational objectives, the resources to be used for attaining these objectives. The policies are governing for acquisition and use of these resources and attaining the objectives. It involves actions that change the character or direction of the organisation.
2. **Management Planning and control:** The process of ensuring that resources are obtained and used efficiently in the accomplishment of the organisation's objectives. It is carried on within the framework

recognised by strategic planning and is similar to operating control.

3. **Technical Planning and Control:** The process of ensuring efficient acquisition and use of resources. The optimum relationship between outputs and resources can be accurately estimated through financial accounting and quality controls.

Finally, in the study of Strategic Management Accounting, another key term in long range planning. It is absolutely reasonable to have long-range operating and technical plans that are not strategic. However, it should be noted that the majority strategic decisions have long-term ramifications.



CHECK YOUR PROGRESS

Q 4: State two points of elements of Strategic Management Accounting.

.....

.....

1.7 SCOPE OF STRATEGIC MANAGEMENT ACCOUNTING

The management processes and decisions which determine the long –term structure and activities of the organization, the primary objective of the Strategic Management Accounting is to serve the management in its function of planning, directing and controlling and to serve the management. It helps the management to discharge its duties and responsibility efficiently, may be considered as falling within the scope of Strategic Management Accounting. Consequently, it is very difficult task to specify the scope of a growing subject like Strategic Management Accounting. However the scope of Strategic Management Accounting is discussed below:

1. **Structure of the organisation:** An organisation is managed by people within a structure. The decisions which result from the way that manages work together within the structure can result in strategic change.
2. **Activities of the organisation:** This is potentially for identifying various

areas of study and we normally shall centre upon all activities which affect the organisation.

3. **Financial Accounting:** Strategic Management Accounting gathers maximum data from financial accounting. Though financial accounting generates only the historical data, they are useful for planning, directing and controlling purposes. With the help of financial analysis tools, the management accountant analyses and interprets the financial data to get a greater insight into the company's performance and position etc. Hence, financial accounting is considered as falling within the scope of Strategic Management Accounting.

4. **Cost Accounting:** It has been considered as an integral part of Strategic Management Accounting due to two important reasons; Firstly, the reason is like financial accounting, cost accounting also generates voluminous data about the primary activity of the company, i.e. cost of production and selling the goods and services.

   Secondly, the reason is also the revenue from the activity of the company, it also provides a number of sophisticated analytical tools like marginal costing, standard costing, budgetary control, inter firm comparison etc., which are being used in the management accountant to discharge his duties and responsibilities.

5. **Tools and techniques of financial analysis:** Financial statements are analysed and interpreted to get an idea about the company's performance and prospects. The different tools which are used to accomplish this objective are comparative financial statements, common-size financial statements, trend ratios, ratio analysis and statement of changes in financial position.

6. **Control Accounting:** Controlling means to measure the variation if any between actual and standard results and taking corrective measures to remove the variation. Management Accounting is the essential part of control accounting; budgetary control, inventory control and equality control are some of the important techniques of Strategic Management Accounting for control accounting.

7. **Management reporting:** Collection of facts and figures, analysis and

classification of the same are done with the sole objective of reporting to the management. The reports are important as they identify the achievements and failures, the strong and weak areas, the positive and the negative aspects of the company. Management reviews the performance of the company and each of the divisions, on continuous basis of these reports and take appropriate action. The management reports which are called the internal reports are the subject matter of Strategic Management Accounting.

1.8 ADVANTAGES OF STRATEGIC MANAGEMENT ACCOUNTING

The following are the advantages of Strategic Management Accounting are as follows:

a. It helps in decision-making if a company needs to drop certain business lines to recover its profit margin and cut inefficient operations.
b. Using Strategic Management Accounting to build up cost leadership strategies and strong economic forecasts can help companies improve its market share in the economic marketplace.
c. Company earns more profits and the opportunity to expand its operations or enter new business markets.
d. Companies may also be able to create a distinct competitive advantage over competitors in its business industry.

1.9 LIMITATIONS OF STRATEGIC MANAGEMENT ACCOUNTING

The following are the limitations of Strategic Management Accounting:

a. Implementing Strategic Management Accounting can be a difficult and expensive process for companies.
b. Accountants are generally trained to only collect financial information, input the information into the accounting software and prepare financial reports.
c. Strategic Management Accounting attempts to change this approach by including management accountants in the strategic planning and

decision making process.

d. This change goes against decades of traditional accounting training, requiring companies to develop new business thought processes in their accountants.



CHECK YOUR PROGRESS

Q 5: Mention two limitations of Strategic Management Accounting?

.....

.....

Q 6: State a point of Advantage of Strategic Management Accounting.

.....

.....



1.10 LETS US SUM UP

After going through the unit we have come through the following:

- The various elements of Strategic Management Accounting.
- The scope of Strategic Management Accounting.
- The developing process of Strategic Management Accounting.
- The advantages and the disadvantages of Strategic Management Accounting.
- The evolution of Strategic Management Accounting.



1.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Strategic Management Accounting is an outward looking and future oriented accounting system designed by the management in the provision of information for the formulation, implementation and

evaluation of strategy to cope with environmental demands.

Ans to Q No 2:

Management by control of performance

Management by extrapolation

Management by anticipation

Management through flexible response

Ans to Q No 3:

1. It provides a way to anticipate future problems and opportunities.
2. It provides employees with a clear objectives and directions for the future of the organisation.

Ans to Q No 4:

1. Strategic Planning and Control.
2. Management Planning and Control.

Ans to Q No 5:

a. Implementing Strategic Management Accounting can be a difficult and expensive process for companies.

b. Accountants are generally trained to only collect financial information, input the information into the accounting software and prepare financial reports.

Ans to Q No 6:

a. It can also conclude if a company needs to drop certain business lines to recover its profit margin and cut inefficient operations.



1.12 FURTHER READING

1) Stategic Management Accounting (Theory and Practice) - By V.K.Kumar.

2) Cost and Management Accounting- By Shashi K. Gupta and Sharma.

3) Modern Cost and Management Accounting – By M. Hanif.

4) Cost Accounting (Principles and Practice) –By M.N. Arora.

5) Management Accounting- By Paresh Shah.

1.13 MODEL QUESTIONS

Q 1: Explain the me aning of Strategic Management Accounting.

Q 2: Explain the evolution and importance of Strategic Management Accounting.

Q 3: Discuss the process of developing the Strategic Management Accounting.

Q 4: Explain the benefits of Strategic Management Accounting.

Q 5: Explain the advantages of Strategic Management Accounting.

Q 6: Explain the limitation of Strategic Management Accounting.

Q 7: Discuss the scope of Strategic Management Accounting.

*** ***** ***



UNIT 2: STRATEGIC PLANNING AND CONTROL

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Definition of Strategic Planning

2.4 Components of Strategic Planning

2.5 Strategic Planning Process

- 2.5.1 Mission and Objectives
- 2.5.2 Environmental Scanning
- 2.5.3 Strategy Formulation
- 2.5.4 Strategy Implementation
- 2.5.5 Evaluation and Control

2.6 Management Control

2.7 Operating Control

2.8 Differences between Strategy Formulation and Management Control

2.9 Distinction between Control Management and task Control

2.10 Let Us Sum Up

2.11 Answers to Check Your Progress

2.12 Further Reading

2.13 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define Strategic Planning
- discuss the different components of strategic planning
- describe the strategic planning process
- differentiate between the management control and operating control
- differentiat between strategy formulation and control management.

2.2 INTRODUCTION

This unit discusses the concept of Strategic Planning. It is the process by which an organization envisions its future and develops the necessary procedures and operations to achieve those future goals. The basic steps of the strategic planning includes information gathering and analysis, identification of critical issues facing the organization, development of a strategic vision and the development of strategic plan.

Every organization occasionally has to make some important decisions that affect the entire destiny of the organization for years into the future. These decisions address to the most important issues faced by the organization which are so significant that we might call them 'strategic elephants'. So, the strategic planning must have something about big decision. Such decisions are not just mere adjustments to activity levels but the kind of decisions that may lead to a substantially different organizational structure. It also changes the relations among key stakeholders, competitive positions and strategic partners of the organization.

Organizations have to take decisions in camplex situations. Such situations calls for corporate planning, strategic planning, business planning etc.

The term strategic planning must be defined, based on the understanding that strategic plan differs from the business plans in three ways:

Firstly, it looks much further ahead. Secondly, it consists largely of words with a few figures to indicate the scale of the planner's intention and thirdly, the few figures that they contain are tested by the risk analysis technique.

2.3 DEFINITION OF STRATEGIC PLANNING

A systematic documented process for deciding what is the handful of key decisions that an organization viewed as a corporate whole. We must get right in order to thrive over the next few years. The process results

in the production of a corporate strategic plan.

Strategic plan: A set of statements describing the purpose and ethical conduct for an organization together with the specific strategies designed to achieve the targets set for each of these.

2.4 COMPONENTS OF STRATEGIC PLANNING

The key components of ''strategic planning" includes an understanding of the firm's vision, mission, values and strategies.

Vision: It outlines what the organization wants to be. It is a long-term view and concentrates on the future. It can be emotive and is also a source of inspiration. For example, a charity working with the poor might have a vision statement which reads, 'A World without poverty.'

Mission: The fundamental purpose of an organization concisely describing why it exists and what it does to achieve its vision. For example, the charity above might have a mission statement as 'providing jobs for the homeless and unemployed'.

Values: Beliefs that are shared among the stakeholders of an organization. Values drive an organization's culture and priorities and provide a framework in which decisions are made. For example, 'Knowledge and skills are the keys to success.' These examples values may set the priorities of self sufficiency over shelter.

Strategy: It means the art of the general. It is a combination of the goals for which the firm is determined and the policies by which it is seeking to get there. A strategy is sometimes called a road map which is the path chosen to work towards the end vision. The most important part in implementing strategy is that it ensures that the company is going in the right direction.



CHECK YOUR PROGRESS

Q 1: Define Strategic Planning.

.....

.....

Q 2: State two components of Strategic Planning.

.....

.....

2.5 STRATEGIC PLANNING PROCESS

Competitive business environment requires budget oriented planning, methods for a large corporation to survive and prosper. Strategic planning is very important and the firm must engage in it, as it clearly defines objectives and assesses both the internal and external situation to formulate strategy, strategy implementation, and make evaluation and proper control together with necessary adjustments as necessary to stay on track.

1. **Mission and objectives:** The mission statement describes the company's business vision, including the purpose of the firm and the unchanging values.

   Guided by the vision, the firm can define the financial as well as strategic objectives, where financial objectives involve measures such as sales targets and strategic objectives include the firm's business position and may include market share and reputation also.

2. **Environmental Scanning:** The environmental scanning includes internal analysis of the firm, Analysis of the firm's industry and External environment. The internal analysis can identify the firm's strength and weaknesses and external analysis reveals opportunities and threats.

3. **Strategy Formulation:** With the help of environmental scanning, the firm should match its strengths to the opportunities that it has identified, while addressing its weaknesses and external threats. The firm seeks to develop a competitive advantage over its rivals in order to attain profitability.

4. **Strategy Implementation:** Next, the strategy selected is implemented by means of programmes, budgets and procedures. It involves organization and direction of the firm's resources and motivation of the staff to achieve objectives. The way in which the strategy is implemented can have a significant impact on whether it will be successful or not. Therefore, utmost care must be taken to

communicate the strategy withing the organisation and the reasoning behind it.

5. **Evaluation and Control:** Lastly, the strategy implemented must be monitored and necessary adjustment must be made. Some steps are needed to be followed in evaluation and control, such as follows:
   a. Defining the parameters to be measured.
   b. Define target values for those parameters.
   c. Perform measurements.
   d. Compare measured results to the pre-defined standard.
   e. Make necessary changes.

Controlling is one of the managerial functions like planning, organizing, staffing and directing. It is important because it helps to check the errors and to take corrective action, so that deviations are minimized and goals of the organization are achieved in the desired manner.

In modern concept controlling helps in foreseeing actions whereas the earlier concept was used only when errors were detected. Control in management means setting standards, measuring actual performance, comparing actuals with standards and taking correcting actions if necessary.

2.6 MANAGEMENT CONTROL

Management controls are the operational methods that enable work to proceed as expected. Management controls are used daily by managers and employees to accomplish the identified objectives of an organization. The control can be classified as preventive and defective. The preventive controls are designed to discourage errors or any irregularities like a manger's review of purchases prior to approval prevents inappropriate expenditure of office funds. Defective controls are designed to identify an error after it has occurred like an exception report that detects and lists incorrect or incomplete transactions.

It is found that often management controls are documented in terms of policies and procedures. However, sometimes as an organization undergoes structural and functional changes, people within the organization adopt ways of ensuring that work proceeds normally. Again, many times

these controls are not documented. The main purpose of a management control review is to evaluate the entire system and to help the units to operate efficiently and effectively and also to provide a reasonable level of assurance that the process and products for which the organization are responsible are adequately protected.

This management control review provides a variety of benefits which promote sound management which ensures that administrative, financial risks etc. have been adequately addressed. It also eliminates excessive controls that may have accumulated over the years allowing for more efficient operations together with increasing confidence that the responsibilities are carried out according to the plans.

Lastly, determining the risks that exist within the processes being reviewed is one of the most important phases of the management control review.

2.7 OPERATING CONTROL

Operational Control systems are designed to ensure that day-to-day actions are consistent with established plans and objectives. It focuses on events in a recent period. Operational control systems are derived from the requirements of the management control system. Corrective action is taken where performance does not meet standards. This action may involve training, motivation, leadership, discipline and termination.



CHECK YOUR PROGRESS

Q 3: Mention the process of strategic planning.

.....

.....

Q 4: What is Management control?

.....

.....

2.8 DIFFERENCES BETWEEN STRATEGIC FORMULATION AND MANAGEMENT CONTROL

Management control is a set of measurement, analysis and action decisions required for the timely management of the continuing operation of a process.

Bases	Strategy formulation	Control Management
System Design	It is Unsystematic, Strategic decision can be made at any point of time	It is pre-determined procedures and it is also periodic.
Number of persons involved	It is done through few people	Strategy is formulated through many people
Information	It is more external and predictive with less accurate results	Integrated, more internal and historical with more accurate results.
Involved people	Strategy formulation involves top management and staffs.	It involves top management and line managers.
Time horizon	It tends to long term duration.	It tends to short term duration.
Communication	Communication of information is easy.	Communication of information is difficult here.
Discipline	Its discipline is economics.	Its discipline is social psychology.
Mental Activity	It involves creative and analytical	It involves administrative and persuasive.
End Products	The final results are goals and strategies.	The final result is strategy implementation.

2.9 DIFFERENCES BETWEEN CONTROL MANAGEMENT AND TASK CONTROL

The main differences between control management and task control may be stated as under–

Bases	Control Management	Task Control
Mental Activity	It requires administrative and convincing.	It requires follow direction or none.
Discipline	Control management discipline is social psychology.	Task control disciplines are economics and physics.
Time horizon	It tends to time horizon like weekly, monthly and annually.	It tends to time horizon like daily.
Type of cost	The type of cost is discretionary costs.	The type of cost is engineered costs.



2.10 LETS US SUM UP

After going through the unit we have come through the following:

- The concept of strategic planning
- The various components of strategic planning
- The concept of management control and operating control
- The strategic planning process in detail.



2.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Strategic Planning is the process by which an organization envisions its future and develops the necessary procedures and operations to achieve those future goals.

Ans to Q No 2: 1. Vision 2. Mission

Ans to Q No 3: The process includes the following:

1. Mission and objectives.
2. Environmental scanning.
3. Strategy formulation.
4. Strategy implementation.
5. Evaluation and Control.

Ans to Q No 4:

Management control is a set of measurement, analysis and action decisions required for the timely management of the continuing operation of a process.



2.12 FURTHER READING

1) Stategic Management Accounting (Theory and Practice) - By V.K.Kumar.
2) Cost and Management Accounting- By Shashi K. Gupta and Sharma.
3) Modern Cost and Management Accounting – By M.Hanif.
4) Cost Accounting (Principles and Practice) –By M.N.Arora.
5) Management Accounting- By Paresh Shah.

2.13 MODEL QUESTIONS

Q 1: What is Strategic Planning?

Q 2: Explain the Components of Strategic Planning.

Q 3: Explain the management control and operating control.

Q 4: Write the differences between control management and task control.

Q 5: Explain the strategic planning process.

Q 6: What are the differences between Strategy Formulation and Control Management.

*** ***** ***



UNIT 3: CAPITAL BUDGETING

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Basic Principles of Capital Budgeting

3.4 Capital Budgeting techniques

- 3.4.1 Capital Budgeting Techniques under Certainty
- 3.4.2 Non-Discounted Cash Flow Criteria
- 3.4.3 Discounted Cash Flow Criteria

3.5 Comparison of NPV & IRR

3.6 Comparison of NPV & PI

3.7 Modified Internal Rate of Return (MIRR)

3.8 Capital Budgeting Techniques under Uncertainty

- 3.8.1 Statistical Techniques of Risk Analysis
- 3.8.2 Other techniques

3.9 Let Us Sum Up

3.10 Further Reading

3.11 Model Questions

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- state the concept of Capital Budgeting
- learn about different principles of Capital Budgeting
- identify different techniques of Capital Budgeting, under certainty and uncertainty
- learn different comparisons between NPV, IRR and PI
- learn what is Modified Internal Rate of Return (MIRR), Risk and the different statistical techniques of measuring Risk.

3.2 INTRODUCTION

Any investment decision depends upon the decision rule that is applied under the particular circumstances. However, the decision rule itself considers following inputs- Cash flows, Project Life and a Discounting Factor.The effectiveness of the decision rule depends on how these three factors have been properly assessed. Estimation of cash flows require immense understanding of the project before it is implemented; particularly macro and micro view of the economy, polity and the company. Project life is very important, otherwise it will change the entire perspective of the project. So great care is required to be observed for estimating the project life. Cost of capital is being considered as discounting factor which has undergone a change over the years. Cost of capital has different connotations in different economic philosophies. Particularly, India has undergone a change in its economic ideology from a closed economy to open-economy. Hence, determination of cost of capital would carry greatest impact on the investment evaluation.

This unit focuses on various techniques available for evaluating capital budgeting projects. All investment evaluation criteria from its economic viability point of view will be discussed and how it can help in maximizing shareholders' wealth. We shall also look for following general virtues in each technique:

1. It should consider all cash flows to determine the true profitability of the project.
2. It should provide for an objective and unambiguous way of separating good projects from bad projects.
3. It should help ranking of projects according to its true profitability.
4. It should recognize the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferable to later ones.
5. It should help to choose among mutually exclusive projects that project which maximizes the shareholders' wealth.
6. It should be a criterion which is applicable to any conceivable investment project independent of others.

3.3 BASIC PRINCIPLES OF CAPITAL BUDGETING

Capital budgeting has a rich history and sometimes employs some sophisticated procedures. Fortunately, capital budgeting relies on just a few basic principles and typically uses the following assumptions:

1. Decisions are based on cash flows: The decisions are not based on accounting concepts, such as net income. Furthermore, intangible costs and beneûts are often ignored because, if they are real, they should result in cash ûows at some other time.
2. Timing of cash flows is crucial: Analysts make an extraordinary effort to detail precisely when cash flows occur.
3. Cash ûows are based on opportunity costs: What are the incremental cash ûows that occur with an investment, compared to what they would have been without the investment?
4. Cash flows are analyzed on an after - tax basis: Taxes must be fully reflected in all capital budgeting decisions.
5. Financing costs are ignored: This may seem unrealistic, but it is not. Most of the time, analysts want to know the after - tax operating cash flows that result from a capital investment. Then these after - tax cash ûows and the investment outlays are discounted at the required rate of return to ûnd the net present value (NPV). Financing costs are reflected in the required rate of return. If we included ûnancing costs in the cash flows and in the discount rate, we would be double - counting the financing costs. So, even though a project may be financed with some combination of debt and equity, we ignore these costs, focusing on the operating cash ûows and capturing the costs of debt (and other capital) in the discount rate.

Capital budgeting cash ûows are not accounting net income. Accounting net income is reduced by noncash charges such as accounting depreciation. Furthermore, to reûect the cost of debt ûnancing, interest expenses are also subtracted from accounting net income. (No subtraction is made for the cost of equity ûnancing in arriving at accounting net income.) Accounting net income also differs from economic income, which is the

cash in flow plus the change in the market value of the company. Economic income does not subtract the cost of debt ûnancing, and it is based on the changes in the market value of the company, not on changes in its book value (accounting depreciation).

3.4 CAPITAL BUDGETING TECHNIQUES

A number of capital budgeting techniques are used in practice. They may be grouped in the following two categories: -

I. Capital budgeting techniques under certainty; and

II. Capital budgeting techniques under uncertainty

Capital budgeting techniques under certainty:

Capital budgeting techniques (Investment appraisal criteria) under certainty can also be divided into following two groups:

Non-Discounted Cash Flow Criteria: -

(a) Pay Back Period (PBP)

(b) Accounting Rate of Return (ARR)

Discounted Cash Flow Criteria: -

(a) Net Present Value (NPV)

(b) Internal Rate of Return (IRR)

(c) Profitability Index (PI)

Non-Discounted Cash Flow Criteria:

These are also known as traditional techniques:

(a) Pay Back Period (PBP):

The pay-back period (PBP) is the traditional method of capital budgeting. It is the simplest and perhaps, the most widely used quantitative method for appraising capital expenditure decision.

Meaning:

It is the number of years required to recover the original cash outlay invested in a project.

Methods to compute PBP:

There are two methods of calculating the PBP.

(a) The first method can be applied when the Cash Flow After Tax (CFAT) is uniform. In such a situation the initial cost of the investment is

divided by the constant annual cash flow: For example, if an investment of Rs. 100000 in a machine is expected to generate cash inflow of Rs. 20,000 p.a. for 10 years. Its PBP will be calculated using following formula:

PBP= Initial Investment/Constant Annual Cash Inflow= 100000/20000= 5 years.

(b) The second method is used when a project's Cash Flow After Tax (CFAT) are not equal. In such a situation PBP is calculated by the process of cumulating Cash Flow After Tax (CFAT) till the time when cumulative cash flow becomes equal to the original investment outlays.

For example, a firm requires an initial cash outflow of Rs. 20,000 and the annual cash inflows for 5 years are Rs. 6000, Rs. 8000, Rs. 5000, Rs. 4000 and Rs. 4000 respectively. Calculate PBP. Here, when we cumulate the cash flows for the first three years, Rs. 19,000 is recovered. In the fourth year Rs. 4000 cash flow is generated by the project but we need to recover only Rs. 1000 so the time required recovering Rs. 1000 will be (Rs.1000/Rs.4000) × 12 months = 3 months. Thus, the PBP is 3 years and 3 months (3.25 years).

Decision Rule:

The PBP can be used as a decision criterion to select investment proposal.

- If the PBP is less than the maximum acceptable payback period, accept the project.
- If the PBP is greater than the maximum acceptable payback period, reject the project.

This technique can be used to compare actual pay back with a standard pay back set up by the management in terms of the maximum period during which the initial investment must be recovered. The standard PBP is determined by management subjectively on the basis of a number of factors such as the type of project, the perceived risk of the project etc. PBP can be even used for ranking mutually exclusive projects. The projects may be ranked according to the length of PBP and the

project with the shortest PBP will be selected.

Merits:

1. It is simple both in concept and application and easy to calculate.
2. It is a cost effective method which does not require much of the time of finance executives as well as the use of computers.
3. It is a method for dealing with risk. It favors projects which generates substantial cash inflows in earlier years and discriminates against projects which brings substantial inflows in later years. Thus PBP method is useful in weeding out risky projects.
4. This is a method of liquidity. It emphasizes selecting a project with the early recovery of the investment.

Demerits:

1. It fails to consider the time value of money. Cash inflows, in pay back calculations, are simply added without discounting. This violates the most basic principles of financial analysis that stipulates the cash flows occurring at different points of time can be added or subtracted only after suitable compounding/ discounting.
2. It ignores cash flows beyond PBP. This leads to reject projects that generate substantial inflows in later years. To illustrate, consider the cash flows of two projects, “A” & “B”:

Year	Project A (in Rs.)	Project B (in Rs.)
0	200000	200000
1	100000	40000
2	60000	40000
3	40000	40000
4	20000	80000
5		60000
6		70000

The PB criterion prefers A, which has PBP of 3 years in comparison to B, which has PBP of 4 years, even though B has very substantial cash flows in 5 and 6 years also. Thus, it does not consider all cash flows

generated by the projects.

3. It is a measure of projects capital recovery, not profitability so this can not be used as the only method of accepting or rejecting a project. The organization need to use some other method also which takes into account profitability of the project.
4. The projects are not getting preference as per their cash flow pattern. It gives equal weightage to the projects if their PBP is same but their pattern is different. For example, each of the following projects requires a cash outlay of Rs. 20,000. If we calculate its PBP it is same for all projects i.e. 4 years so all will be treated equally. But the cash flow pattern is different so in fact, project Y should be preferable as it gives higher cash inflow in the initial years.

CASH INFLOWS

Year	Project X	Project Y	Project Z
1	5000	8000	2000
2	5000	6000	4000
3	5000	4000	6000
4	5000	2000	8000
5	5000	-	-

5. There is no logical base to decide standard PBP of the organization it is generally a subjective decision.
6. It is not consistent with the objective of shareholders' wealth maximization. The PBP of the projects will not affect the market price of equity shares.

Uses:

The PBP can be gainfully employed under the following circumstances.

1. The PB method may be useful for the firms suffering from a liquidity crisis.
2. It is very useful for those firms which emphasizes on short run earning performance rather than its long term growth.
3. The reciprocal of PBP is a good approximation of IRR which

otherwise requires trial & error approach.

Payback Reciprocal and the Rate of Return:

Payback is considered a good approximation of the rate of return under the following two conditions.

1. The life of the project is too large or at least twice the pay-back period.
2. The project generates constant annual cash inflow.

   Though pay back reciprocal is a useful way to estimate the project's IRR but the major limitation of it is all investment project does not satisfy the conditions on which this method is based. When the useful life of the project is not at least twice the PBP, it will always exceed the rate of return. Similarly, if the project is not yielding constant CFAT it cannot be used as an approximation of the rate of return.

Discounted Payback Period:

One of the major limitations of PBP method is that it does not take into consideration time value of money. This problem can be solved if we discount the cash flows and then calculate the PBP. Thus, discounted payback period is the number of years taken in recovering the investment outlay on the present value basis. But it still fails to consider the cash flows beyond the payback. For example, one project requires investment of Rs. 80,000 and it generates cash flow for 5 years as follows.

SIMPLE PBP AND DISCOUNTED PBP

Years	0	1	2	3	4	5	Simple PBP	Discounted PBP
Cash Flow	(80000)	22000	30000	40000	32000	16000	2.7 years	
PV@5%		0.833	0.694	0.579	0.482	0.402		
PV		18326	20820	23160	15424	6432		
Cumulative PV of cash flow		18326	39146	62306	77730	84162		4.03 years

The simple pay back of the project is 2.7 years while discounted pay back is 4.03 years which is higher than simple pay back because the discounted

payback is using cash flow after discounting it with the cost of capital.

(b) Accounting/Average Rate of Return (ARR):

This method is also known as the return on investment (ROI), return on capital employed (ROCE) and is using accounting information rather than cash flow.

Meaning:

The ARR is the ratio of the average after tax profit divided by the average investment.

Method to compute ARR:

There are a number of alternative methods for calculating ARR. The most common method of computing ARR is using the following formula:

ARR=(Average Annual Profit After Taxes/Average Investment)* 100

The average profits after tax are determined by adding up the PAT for each year and dividing the result by the number of years.

The average investment is calculated by dividing the net investment by two.

Decision Rule:

The ARR can be used as a decision criterion to select investment proposal.

- If the ARR is higher than the minimum rate established by the management, accept the project.
- If the ARR is less than the minimum rate established by the management, reject the project.

The ranking method can also be used to select or reject the proposal using ARR. It will rank a project number one if it has highest ARR and lowest rank would be given to the project with lowest ARR.

Merits:

1. It is simple to calculate.
2. It is based on accounting information which is readily available and familiar to businessman.
3. It considers benefit over entire life of the project.

Demerits:

1. It is based upon accounting profit, not cash flow in evaluating projects.
2. It does not take into consideration time value of money so benefits

in the earlier years or later years cannot be valued at par.

3. This method does not take into consideration any benefits which can accrue to the firm from the sale or abandonment of equipment which is replaced by a new investment. ARR does not make any adjustment in this regard to determine the level of average investments.
4. Though it takes into account all years' income but it is averaging out the profit.
5. The firm compares any project's ARR with the one which is arbitrarily decided by management generally based on the firm's current return on assets. Due to this yardstick sometimes super normal growth firm's reject profitable projects if it's ARR is less than the firm's current earnings.

Use:

The ARR can better be used as performance evaluation measure and control devise but it is not advisable to use as a decision making criterion for capital expenditures of the firm as it is not using cash flow information.

Discounted Cash Flow Criteria:

These are also known as modern or time adjusted techniques because all these techniques take into consideration time value of money.

(a) Net Present Value (NPV):

The net present value is one of the discounted cash flow or time-adjusted technique. It recognizes that cash flow streams at different time period differs in value and can be computed only when they are expressed in terms of common denominator i.e. present value.

Meaning:

The NPV is the difference between the present value of future cash inflows and the present value of the initial outlay, discounted at the firm's cost of capital.

The procedure for determining the present values consists of two stages. The first stage involves determination of an appropriate discount rate. With the discount rate so selected, the cash flow streams are converted into present values in the second stage.

Method to compute NPV:

The important steps for calculating NPV are given below:

1. Cash flows of the investment project should be forecasted based on realistic assumptions. These cash flows are the incremental cash inflow after taxes and are inclusive of depreciation (CFAT) which is assumed to be received at the end of each year. CFAT should take into account salvage value and working capital released at the end.
2. Appropriate discount rate should be identified to discount the forecasted cash flows. The appropriate discount rate is the firm's opportunity cost of capitalwhich is equal to the required rate of return expected by investors on investments of equivalent risk.
3. Present value (PV) of cash flows should be calculated using opportunity cost of capital as the discount rate.
4. NPV should be found out by subtracting present value of cash outflows from present value of cash inflows. The project should be accepted if NPV is positive (i.e. NPV >0)

The NPV can be calculated with the help of equation.

NPV = Present value of cash inflows – Initial investment

$$W = \frac{A_1}{(1+K)^1} + \frac{A_2}{(1+K)^2} + \frac{A_3}{(1+K)^3} + \ldots\ldots + \frac{A_n}{(1+K)^n} - C$$

where,

A1,A2 … represent the stream of benefits expected to occur if a course of action is adopted,

C is the cost of that action,

K is the appropriate discount rate to measure the quality of A's,

W is the NPV or, wealth which is the difference between the present worth of the stream of benefits and the initial cost.

Decision Rule:

The present value method can be used as an accept-reject criterion. The present value of the future cash streams or inflows would be compared with present value of outlays. The present value outlays are the same as the initial investment.

If the NPV is greater than 0, accept the project.

If the NPV is less than 0, reject the project.

Symbolically, accept-reject criterion can be shown as below:

PV > C '! Accept [NPV > 0]

PV < C '! Reject [NPV < 0]

Where, PV is present value of inflows and C is the outlay.

This method can be used to select between mutually exclusive projects also. Using NPV the project with the highest positive NPV would be ranked first and that project would be selected. The market value of the firm's share would increase if projects with positive NPVs are accepted.4

For example,

Calculate NPV for a Project X initially costing Rs. 250000. It has 10% cost of capital. It generates following cash flows:

Year	Cash Flows	PV@10%	PV
1	90000	0.909	81810
2	80000	0.826	66080
3	70000	0.751	52570
4	60000	0.683	40980
5	50000	0.621	31050
Less:		ÓPV	272490
		NCO	250000
		NPV(Rs.)	22490

As the project has positive NPV, i.e. present value of cash inflows is greater than the cash outlays, it should be accepted.

Merits:

This method is considered as the most appropriate measure of profitability due to following virtues.

1. It explicitly recognizes the time value of money.
2. It takes into account all the years' cash flows arising out of the project over its useful life.

3. It is an absolute measure of profitability.
4. A changing discount rate can be built into NPV calculation. This feature becomes important as this rate normally changes because the longer the time span, the lower the value of money & higher the discount rate.
5. This is the only method which satisfies the value-additivity principle. It gives output in terms of absolute amount so the NPVs of the projects can be added which is not possible with other methods. For example, NPV (X+Y) = NPV (X) + NPV (Y). Thus, if we know the NPV of all project undertaken by the firm, it is possible to calculate the overall value of the firm.
6. It is always consistent with the firm's goal of shareholders' wealth maximization.

Demerits:

1. This method requires estimation of cash flows which is very difficult due to uncertainties existing in business world due to so many uncontrollable environmental factors.
2. It requires the calculation of the required rate of return to discount the cash flows. The discount rate is the most important element used in the calculation of the present values because different discount rates will give different present values. The relative desirability of the proposal will change with a change in the discount rate.7
3. When projects under consideration are mutually exclusive, it may not give dependable results if the projects are having unequal lives, different cash flow pattern, different cash outlay etc.
4. It does not explicitly deal with uncertainty when valuing the project and the extent of management's flexibility to respond to uncertainty over the life of the project.8
5. It ignores the value of creating options. Sometimes an investment that appears uneconomical when viewed in isolation may, in fact, create options that enable the firm to undertake other investments in the future should market conditions turnfavorable. By not

accounting properly for the options that investments in emerging technology may yield, naive NPV analysis can lead firms to invest too little.

Use:

NPV is very much in use capital budgeting practice being a true profitability measure.

(b) Profitability Index (PI):

Profitability Index (PI) or Benefit-cost ratio (B/C) is similar to the NPV approach. PI approach measures the present value of returns per rupee invested. It is observed in shortcoming of NPV that, being an absolute measure, it is not a reliable method to evaluate projects requiring different initial investments. The PI method provides solution to this kind of problem.

Meaning:

It is a relative measure and can be defined as the ratio which is obtained by dividing the present value of future cash inflows by the present value of cash outlays. Mathematically,

PI = (Present Value of Cash Inflow/ Initial Cash Outlay).

This method is also known as B/C ratio because numerator measures benefits & denominator cost.

Decision Rule:

Using the PI ratio,

- Accept the project when PI>1
- Reject the project when PI<1

May or may not accept when PI=1, the firm is indifferent to the project.

When PI is greater than, equal to or less than 1, NPV is greater than, equal to or less than 0 respectively.

The selection of the project with the PI method can also be done on the basis of ranking. The highest rank will be given to the project with the highest PI, followed by the others in the same order.

Merits:

1. PI considers the time value of money as well as all the cash flows generated by the project.
2. At times it is a better evaluation technique than NPV in a situation of

capital rationing especially. For instance, two projects may have the same NPV of Rs. 20,000 but project A requires an initial investment of Rs. 1, 00,000 whereas B requires only Rs. 50,000. The NPV method will give identical ranking to both projects, whereas PI will suggest project B should be preferred. Thus PI is better than NPV method as former evaluate the worth of projects in terms of their relative rather than absolute magnitude.

3. It is consistent with the shareholders' wealth maximization.

Demerits: Though PI is a sound method of project appraisal and it is just a variation of the NPV, it has all those limitations of NPV method too.

1. When cash outflow occurs beyond the current period, the PI is unsuitable as a selection criterion.
2. It requires estimation of cash flows with accuracy which is very difficult under ever changing world.
3. It also requires correct estimation of cost of capital for getting correct result.
4. When the projects are mutually exclusive and it has different cash outlays, different cash flow pattern or unequal lives, it may not give unambiguous results.

Use:

It is useful in evaluating capital expenditures projects being a relative measure.

(c) Internal Rate of Return (IRR):

This technique is also known as yield on investment, marginal productivity of capital, marginal efficiency of capital, rate of return, and time-adjusted rate of return and so on. It also considers the time value of money by discounting the cash flow streams, like NPV. While computing the required rate of return and finding out present value of cash flows-inflows as well as outflows- are not considered. But the IRR depends entirely on the initial outlay and the cash proceeds of the projects which are being evaluated for acceptance or rejection. It is, therefore, appropriately referred to as internal rate of return. The IRR is usually the rate of return that a project earns.

Meaning:

The internal rate of return (IRR) is the discount rate that equates the NPV

of an investment opportunity with Rs.0 (because the present value of cash inflows equals the initial investment). It is the compound annual rate of return that the firm will earn if it invests in the project and receives the given cash inflows.12

Mathematically, IRR can be determined by solving following equation for r:

$$C_0 = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \cdots .... + \frac{C_n}{(1+r)^n}$$

where, r = The internal rate of return.

Ct = Cash inflows at t period

C0 = Initial Investment

Methods to compute IRR:

1. When any project generates uneven cash flow, the IRR can be found out by trial and error. If the calculated present value of the expected cash inflow is lower than the present value of cash outflows a lower rate should be tried and vice versa. This process can be repeated unless the NPV becomes zero.
2. When any project generates equal cash flows every year, we can calculate IRR as follows.

For example,

An investment requires an initial investment of Rs. 6,000. The annual cash flow is estimated at Rs. 2000 for 5 years. Calculate the IRR.

NPV = (Rs.6,000) +Rs.2,000 ($PVAIF_{5,x}$) = 0

Rs. 6,000 = 2,000 ()

() = Rs. (6000/2000) = 3.

The rate which gives a PVAIF of 3 for 5 years is the project's IRR approximately. While referring PVAIF table across the 5 years' row, we find it approximately under 20% (2.991) column. Thus 20% (approximately) is the project's IRR which equates the present value of the initial cash outlay (Rs. 6000) with the constant annual cash flows (Rs. 2000 p.a.) for 5 years.

Decision Rule:

When IRR is used to make accept-reject decisions, the decision criteria are as follows:

- If the IRR is greater than the cost of capital, accept the project. (r

>k)

- If the IRR is less than the cost of capital, reject the project. (r<k)

Merits:

1. It considers the time value of money and it also takes into account the total cash flows generated by any project over the life of the project.
2. IRR is a very much acceptable capital budgeting method in real life as it measures profitability of the projects in percentage and can be easily compared with the opportunity cost of capital.
3. It is consistent with the overall objective of maximizing shareholders' wealth.

Demerits:

1. It requires lengthy and complicated calculations.
2. When projects under consideration are mutually exclusive, IRR may give conflicting results.
3. We may get multiple IRRs for the same project when there are nonconventional cash flows especially.
4. It does not satisfy the value additivity principle which is the unique virtue of NPV.

3.5 COMPARISON OF NPV AND IRR

Both NPV and IRR will give the same results (i.e. acceptance or rejections) regarding an investment proposal in following two situations.

1. When the project under consideration involve conventional cash flow. i.e. when an initial cash outlays is followed by a series of cash inflows.
2. When the projects are independent of one another i.e., proposals the acceptance of which does not preclude the acceptance of others and if the firm is not facing a problem of funds constraint.

The reasons for similarity in results in the above cases are simple. In NPV method a proposal is accepted if NPV is positive. NPV will be positive only when the actual rate of return on investment is more than the cut off rate. In case of IRR method, a proposal is accepted only when the IRR is

higher than the cut off rate. Thus, both methods will give consistent results since the acceptance or rejection of the proposal under both of them is based on the actual return being higher than the required rate i.e.

NPV will be positive only if r> k, NPV will be negative only if r <k, NPV would be zero only if r = k.

3.6 COMPARISON OF NPV AND PI

The NPV method and PI method will give same acceptance or rejection decision when the projects are independent and there is capital rationing because of the following reason:

- PI will be greater than one, only when NPV will be positive i.e. (PI>1 when NPV +ve--)
- PI will be less than one, only when NPV will be negative i.e. (PI<1 when NPV -ve)

But when the projects are mutually exclusive, there may be conflict in results between the two techniques.

PI will be a useful technique when two mutually exclusive projects give same NPV but the costs of both these projects are different from each other.

3.7 MODIFIED INTERNAL RATE OF RETURNS (MIRR)

Despite NPV's conceptual superiority, managers seem to prefer IRR over NPV because IRR is intuitively more appealing as it is a percentage measure. The modified IRR or MIRR overcomes the shortcomings of the regular IRR.

The procedure for calculating MIRR is as follows:

Step 1: Calculate the present value of the costs (PVC) associated with the project, using cost of capital (r) as the discount rate :

$$PVC = \sum_{t=0}^{n} \frac{(Cash\ Outflow)^t}{(1+r)^t}$$

Step 2: Calculate the terminal value (TV) of the cash inflows expected from the project:

$$TV = \sum_{t=0}^{n} Cash\ Inflow_t(1+r)^{n-t}$$

Step 3: Obtain MIRR by solving the following equation:

$$PVC = \frac{TV}{(1+MIRR)^n}$$

Evaluation

MIRR is superior to the regular IRR in two ways.

1. MIRR assumes that project cash flows are reinvested at the cost of capital whereas the regular IRR assumes that project cash flows are reinvested at the project's own IRR. Since reinvestment at cost of capital (or some other explicit rate) is more realistic than reinvestment at IRR, MIRR reflects better the true profitability of a project.
2. The problem of multiple rates does not exist with MIRR.

Thus, MIRR is a distinct improvement over the regular IRR but we need to take note of the following:

- If the mutually exclusive projects are of the same size, NPV and MIRR lead to the same decision irrespective of variations in life.
- If the mutually exclusive projects differ in size, there may be a possibility of conflict between NPV and IRR. MIRR is better than the regular IRR in measuring true rate of return. However, for choosing among mutuallyexclusive projects of different size, NPV is a better alternative in measuring the contribution of each project to the value of the firm.

3.8 CAPITAL BUDGETING TECHNIQUES UNDER UNCERTAINTY

Risk can be defined as the chance that the actual outcome will differ from the expected outcome. Uncertainty relates to the situation where a range of differing outcome is possible, but it is not possible to assign probabilities to this range of outcomes. The two terms are generally used interchangeably in finance literature. In investment appraisal, managers

are concerned with evaluating the riskiness of a project's future cash flows. Here, they evaluate the chance that the cash flows will differ from expected cash flows, NPV will be negative or the IRR will be less than the cost of capital. In the context of risk assessment, the decision-maker does not know exactly what the outcome will be but it is possible to assign probability weightage to the various potential outcomes. The most common measures of risk are standard deviation and coefficient of variations. There are three different types of project risk to be considered19:

1. Stand-alone risk: This is the risk of the project itself as measured in isolation from any effect it may have on the firm's overall corporate risk.
2. Corporate or within-firm risk: This is the total or overall risk of the firm when it is viewed as a collection or portfolio of investment projects.
3. Market or systematic risk: This defines the view taken from a well-diversified shareholders and investors. Market risk is essentially the stock market's assessment of a firm's risk, its beta, and this will affect its share price.

Due to practical difficulties of measuring corporate and market risk, the stand-alone risk has been accepted as a suitable substitute for corporate and market risk. There are following techniques one can use to deal with risk in investment appraisal.

Statistical Techniques for Risk Analysis:

(a) Probability Assignment

(b) Expected Net Present Value

(c) Standard Deviation

(d) Coefficient of Variation

(e) Probability Distribution Approach

(f) Normal Probability Distribution

(a) Probability Assignment:

The concept of probability is fundamental to the use of the risk analysis techniques. It may be defined as the likelihood of occurrence of an event. If an event is certain to occur, the probability of its occurrence is one

but if an event is certain not to occur, the probability of its occurrence is zero. Thus, probability of all events to occur lies between zero and one.

The classical view of probability holds that one can talk about probability in a very large number of times under independent identical conditions. Thus, the probability estimate, which is based on a large number of observations, is known as an objective probability. But this is of little use in analyzing investment decisions because these decisions are non-repetitive in nature and hardly made under independent identical conditions over time. The another view of probability holds that it makes a great deal of sense to talk about the probability of a single event without reference to the repeatability long run frequency concept. Therefore, it is perfectly valid to talk about the probability of sales growth will reach to 4%, the probability of rain tomorrow or fifteen days hence. Such probability assignments that reflect the state of belief of a person rather than the objective evidence of a large number of trials are called personal or subjective probabilities.

(b) Expected Net Present Value:

Once the probability assignments have been made to the future cash flows, the next step is to find out the expected net present value. It can be found out by multiplying the monetary values of the possible events by their probabilities. The following equation describes the expected net present value.

$$ENPV = \sum_{t=0}^{n} \frac{ENCF_t}{(1+k)^t}$$

Where ENPV is the expected net present value, ENCFt expected net cash flows in period t and k is the discount rate. The expected net cash flow can be calculated as follows:

$$ENCF_t = NCF_{jt} * P_{jt}$$

Where is net cash flow for j'th event in period t and probability of net cash flow for j'th event in period t.

(c) Standard Deviation:

The assignment of probabilities and the calculation of the expected

net present value include risk into the investment decision, but a better insight into the risk analysis of capital budgeting decision is possible by calculating standard deviation and coefficient of variation.

Standard deviation (ó)is an absolute measure of risk analysis and it can be used when projects under consideration are having same cash outlay. Statically, standard deviation is the square root of variance and variance measures the deviation about expected cash flow of each of the possible cash flows. The formula for calculating standard deviation will be as follows:

$$\sigma = \sqrt{\sum_{i=1}^{n} P_i(CF_i - \overline{CF})^2}$$

Thus, it is the square root of the mean of the squared deviation, where deviation is the difference between an outcome and the expected mean value of all outcomes and the weights to the square of each deviation is provided by its probability of occurrence.

(d) Coefficient of Variation:

If the projects to be compared involve different outlays/different expected value, the coefficient of variation is the correct choice, being a relative measure. It can be calculated using following formula:

CV = (Standard Deviation/Expected Value)

The higher the coefficient of variation, the riskier the project. Project Y is having higher coefficient so it is riskier than the project X. It is a better measure of the uncertainty of cash flow returns than the standard deviation because it adjusts for the size of the cash flow.

(e) Probability Distribution Approach:

The researcher has discussed the concept of probability for incorporating risk in capital budgeting proposals. The concept of probability for incorporating risk in evaluating capital budgeting proposals. The probability distribution of cash flows over time provides valuable information about the expected value of return and thedispersion of the probability distribution of possible returns which helps in taking accept-reject decision of the investment decision.

The application of this theory in analyzing risk in capital budgeting

depends upon the behavior of the cash flows, being (i) independent, or (ii) dependent. The assumption that cash flows are independent over time signifies that future cash flows are not affected by the cash flows in the preceding or following years. When the cash flows in one period depend upon the cash flows in previous periods, they are referred to as dependent cash flows.

(f) Normal Probability Distribution:

The normal probability distribution can be used to further analyze the risk in investment decision. It enables the decision maker to have an idea of the probability of different expected values of NPV, that is, the probability of NPV having the value of zero or less, greater than zero and within the range of two values for example, within the range of Rs. 2000 and Rs. 3000 etc. If the probability of having NPV zero or less is low, eg. .01, it means that the risk in the project is negligible. Thus, the normal probability distribution is an important statistical technique in the hands of decision makers for evaluating the riskiness of a project.

The area under the normal curve, representing the normal probability distribution, is equal to 1 (0.5 on either side of the mean). The curve has its maximum height at its expected value i.e. its mean. The distribution theoretically runs from minus infinity to plus infinity. The probability of occurrence beyond 3 ó is very near to zero (0.26 per cent).

For any normal distribution, the probability of an outcome falling within plus or minus.

1 ó from the mean is 0.6826 or 68.26 per cent,

2 ó from the mean is 95.46 per cent,

3 ó from the mean is 99.74 per cent.

For example, if one needs to calculate for the above mentioned example the probability of the NPV being zero or less, the probability of the NPV being greater than zero and the probability of NPV between the range of Rs. 1500 and Rs. 3000, it can be calculated as follows using normal distribution.

Probability of the NPV being zero or less:

$$Z = \frac{X - \bar{X}}{\sigma}$$

= -2.533

According to Table Z, the probability of the NPV being zero is = 0.4943, therefore, the probability of the NPV being zero or less would be 0.5-0.4943=0.0057 i.e. 0.57 per cent.

Probability of the NPV being greater than zero:

As the probability of the NPV being less than zero is 0.57 per cent, the probability of the NPV being greater than zero would be 1-0.0057=0.9943 or 99.43 per cent.

Conventional Techniques for Risk Analysis:

(a) Payback

(b) Risk-adjusted Discount Rate

(c) Certainty Equivalent

(a) Payback Period:

Payback as a method of risk analysis is useful in allowing for a specific types of risk only, i.e., the risk that a project will go exactly as planned for a certain period will then suddenly stop generating returns, the risk that the forecasts of cash flows will go wrong due to lower sales, higher cost etc. This method has been already discussed in detail above so it has not been repeated here.

(b) Risk Adjusted Discount Rate Method:

The economic theorists have assumed that to allow for risk, the businessmen required a premium over and above an alternative which is risk free. It is proposed that risk premium be incorporated into the capital budgeting analysis through the discount rate. i.e. If the time preference for the money is to be recognized by discounting estimated future cash flows, at some risk free rate, to their present value, then, to allow for the riskiness of the future cashflow a risk premium rate may be added to risk free discount rate. Such a composite discount would account for both time preference and risk preference.

RADR = Risk free rate + Risk Premium.

The RADR accounts for risk by varying discount rate depending on the

degree of risk of investment projects. Thus projects are evaluated on the basis of future cash flow projections and an appropriate discount rate.

Decision Rule:

- The risk adjusted approach can be used for both NPV & IRR.
- If NPV method is used for evaluation, the NPV would be calculated using risk adjusted rate. If NPV is positive, the proposal would qualify for acceptance, if it is negative, the proposal would be rejected.
- In case of IRR, the IRR would be compared with the risk adjusted required rate of return. If the 'r' exceeds risk adjusted rate, the proposal would be accepted, otherwise not.

Merits:

- It is simple to calculate and easy to understand.
- It has a great deal of intuitive appeal for risk-averse businessman.
- It incorporates an attitude towards uncertainty.

Demerits:

- The determination of appropriate discount rates keeping in view the differing degrees of risk is arbitrary and does not give objective results.
- Conceptually this method is incorrect since it adjusts the required rate of return. As a matter fact it is the future cash flows which are subject to risk.
- This method results in compounding of risk over time, thus it assumes that risk necessarily increases with time which may not be correct in all cases.
- The method presumes that investors are averse to risk, which is true in most cases. However, there are risk seeker investors and are prepared to pay premium for taking risk and for them discount rate should be reduced rather than increased with increase in risk.
- Thus, this approach can be best described as a crude method of incorporating risk into capital budgeting.

(c) Certainty Equivalent Approach:

This approach to incorporate risk in evaluating investment projects, overcomes weaknesses of the RADR approach. Under this approach

riskiness of project is taken into consideration by adjusting the expected cash flows and not discount rate. This method eliminates the problem arising out of the inclusion of risk premium in the discounting process.

The certainty equivalent coefficient(á) can be determined as a relationship between the certain cash flows and the uncertain cash flows.The certainty equivalent coefficient assumes a value between 0 and 1 and varies inversely with risk. The higher the risk, the lower the á and the lower the risk, the higher the á.

Decision Rule:

- If NPV method is used, the proposal would be accepted if NPV of CE cash flows is positive, otherwise it is rejected.
- If IRR is used, the internal rate of return which equates the present value of CE cash inflows with the present value of the cash outflows, would be compared with risk free discount rate. If IRR is greater than the risk free rate, the investment project would be accepted otherwise it would be rejected.

Merits:

- It is simple to calculate.
- It is conceptually superior to time-adjusted discount rate approach because it incorporates risk by modifying the cash flows which are subject to risk.

Demerits:

- This method explicitly recognizes risk, but the procedure for reducing the forecast of cash flows is implicit and likely to be inconsistent from one investment to another.
- The forecaster expecting reduction that will be made in his forecast, may inflate them in anticipation. This will no longer give forecasts according to “best estimate”.
- If forecast have to pass through several layers of management, the effect may be to greatly exaggerate the original forecast or to make it ultra conservative.
- By focusing explicit attention only on the gloomy outcomes, chances are increased for passing by some good investments.

These techniques attempt to incorporate risk but major shortcomings are that specifying the appropriate degree of risk for an investment project is beset with serious operational problems and they cannot be applied to various projects over time.

Other Techniques:

(a) Sensitivity Analysis

(b) Scenario Analysis

(c) Break Even Analysis

(d) Simulation Analysis

(e) Decision Tree Approach

(a) Sensitivity Analysis:

While evaluating any capital budgeting project, there is a need to forecast cash flows. The forecasting of cash flows depends on sales forecast and costs. The Sales revenue is a function of sales volume and unit selling price. Sales volume will depend on the market size and the firm's market share. The NPV and IRR of a project are determined by analyzing the after-tax cash flows arrived at by combining various variables of project cash flows, project life and discount rate. The behavior of all these variables are very much uncertain. The sensitivity analysis helps in identifying how sensitive are the various estimated variables of the project. It shows how sensitive is a project's NPV or IRR for a given change in particular variables. The more sensitive the NPV, the more critical is the variables.

Steps:

The following three steps are involved in the use of sensitivity analysis.

1. Identify the variables which can influence the project's NPV or IRR.
2. Define the underlying relationship between the variables.
3. Analyze the impact of the change in each of the variables on the project's NPV or IRR.

The Project's NPV or IRR can be computed under following three assumptions in sensitivity analysis.

1. Pessimistic (i.e. the worst),
2. Expected (i.e. the most likely)
3. Optimistic (i.e. the best)

Merits:

- The sensitivity analysis has the following advantages:
- It compels the decision maker to identify the variables affecting the cash flow forecasts which helps in understanding the investment project in totality.
- It identifies the critical variables for which special actions can be taken.
- It guides the decision maker to concentrate on relevant variables for the project.

Demerits:

The sensitivity analysis suffers from following limitations:

- The range of values suggested by the technique may not be consistent. The terms 'optimistic' and 'pessimistic' could mean different things to different people.
- It fails to focus on the interrelationship between variables. The study of variability of one factor at a time, keeping other variables constant may not much sense. For example, sales volume may be related to price and cost. One can not study the effect of change in price keeping quantity constant.

(b) Scenario Analysis:

In sensitivity analysis, typically one variable is varied at a time. If variables are interrelated, as they are most likely to be, it is helpful to look at some plausible scenarios, each scenario representing a consistent combination of variables.

Procedure:

The steps involved in scenario analysis are as follows:

1. Select the factor around which scenarios will be built. The factor chosen must be the largest source of uncertainty for the success of the project. It may be the state of the economy or interest rate or technological development or response of the market.
2. Estimate the values of each of the variables in investment analysis (investment outlay, revenues, costs, project life, and so on) for each scenario.

3. Calculate the net present value and/or internal rate of return under each scenario.

Evaluation:

- Scenario analysis may be regarded as an improvement over sensitively analysis because it considers variations in several variables together.
- It is based on the assumption that there are few well-delineated scenarios. This may not be true in many cases. For example, the economy does not necessarily lie in three discrete states, viz., recession, stability, and boom. It can in fact be anywhere on the continuum between the extremes. When a continuum is converted into three discrete states some information is lost.
- Scenario analysis expands the concept of estimating the expected values. Thus in a case where there are 10 inputs the analyst has to estimate 30 expected values (3 x 10) to do the scenario analysis.

(c) Break-even Analysis:

In sensitivity analysis one may ask what will happen to the project if sales decline or costs increase or something else happens. A financial manager will also be interested in knowing how much should be produced and sold at a minimum to ensure that the project does not 'lose money'. Such an exercise is called break even analysis and the minimum quantity at which loss is avoided is called the break-even point. The breakeven point may be defined in accounting terms or financial terms.

(d) Simulation Analysis:

Sensitivity analysis and Scenario analysis are quite useful to understand the uncertainty of the investment projects. But both the methods do not consider the interactions between variables and also, they do not reflect on the probability of the change in variables.36 The power of the computer can help to incorporate risk into capital budgeting through a technique called Monte Carlo simulation. The term "Monte Carlo" implies that the approach involves the use of numbers drawn randomly from probability distributions.37 It is statistically based approach which makes use of random numbers and

preassigned probabilities to simulate a project's outcome or return. It requires a sophisticated computing package to operate effectively. It differs from sensitivity analysis in the sense that instead of estimating a specific value for a key variable, a distribution of possible values for each variable is used. The simulation model building process begins with the computer calculating a random value simultaneously for each variable identified for the model like market size, market growth rate, sales price, sales volume, variable costs, residual asset values, project life etc. From this set of random values, a new series of cash flows is created and a new NPV is calculated. This process is repeated numerous times, perhaps as many as 1000 times or even more for very large projects, allowing a decision-maker to develop a probability distribution of project NPVs. From the distribution model, a mean (expected) NPV will be calculated and its associated standard deviation will be used to gauge the project's level of risk. The distribution ofpossible outcome enables the decision-maker to view a continuum of possible outcomes rather than a single estimate.

Merits:

- An increasingly popular tool of risk analysis, simulation offers certain advantages:
- It facilitates the analysis and appraisal of highly complex, multivariate investment proposals with the help of sophisticated computer packages.
- It can cope up with both independence and dependence amongst variables. It forces decision-makers to examine the relationship between variables.

Demerits:

- Simulation is not always appropriate or feasible for risk evaluation.
- The model requires accurate probability assessments of the key variables. For example, it may be known that there is a correlation between sales price and volume sold, but specifying with mathematical accuracy the nature of the relationship for model purposes may be difficult.

- Constructing simulated financial models can be time-consuming, costly and requires specialized skills, therefore. It is likely to be used to analyze very important, complex, and large-scale projects.
- It focuses on a project's standalone risk. It ignores the impact of diversification, i.e., how a project's stand-alone risk will correlate with that of other projects within the firm and affect the firm's overall corporate risk.
- Simulation is inherently imprecise. It provides a rough approximation of the probability distribution of net present value (or any other criterion of merit).

  Due to its imprecision, the simulated probability distribution may be misleading when a tail of the distribution is critical.
- A realistic simulation model, likely to be complex, would most probably be constructed by a management scientist, not the decision maker. The decision maker, lacking understanding of the model, may not use it.
- To determine the net present value in a simulation run the risk-free discount rate is used. This is done to avoid prejudging risk which is supposed to be reflected in the dispersion of the distribution of net present value. Thus the measure of net present value takes a meaning, very different from its usual one, which is difficult to interpret.

(e) Decision-tree Approach:

Sometimes cash flow is estimated under different managerial options with the help of decision-tree approach. A decision tree is a graphic presentation of the present decision with future events and decisions. The sequence of events is shown in a format that resembles the branches of a tree.

Steps in constructing a Decision Tree:

The first step in constructing a decision tree is to define a proposal. It may be concerning either a new product or an old product entering a new market. It may also be an abandonment option or a continuation option, expansion option or no-expansion option, etc.

Second step is identifying various alternatives. For example, if a firm is

launching a new product, it must chalk out the demand possibilities and on that basis it identifies different alternatives-whether to have a large factory or a medium-size or only a small plant. Each of the alternatives will have varying consequences on the cash flow.

The third step is to lay out the decision tree showing the different alternatives through different branches. And finally, the estimates of cash flow with probabilities in each branch are made. The results of the different branches are calculated that show desirability of a particular alternative over the others.

Merits:

- Decision tree analysis gives the clarity of sequential investment decisions.
- It gives a decision maker to visualize assumptions and alternatives in graphic form which is easier to understand than the analytical form. It helps in eliminating the unprofitable branches and determines optimum decision at various decision points.

Demerits:

- The decision tree becomes more and more complicated if he includes more and more alternatives. It becomes more complicated if the analysis includes interdependent variables which are dependent on one another.
- It becomes very difficult to construct decision tree if the number of years expected life of the project and the number of possible outcomes for each year are large.



3.9 LET US SUM UP

After going through this unit we have come through the following points —

- The investment decision made by managers will determine a number of significant issues like the cash flows generated by the company,

the dividends paid out by the company, the market value of the company, the survival of the company etc.

- The use of capital budgeting techniques allows for much more informed judgments with the caution that their application does become more problematic in a period of rapid technological and economic change.



3.10 FURTHER READING

1. Financial Management by I.M. Pandey, Vikash Publishing House.
2. Financial Management by Khan & Jain.

3.11 MODEL QUESTIONS

1. What do you mean by Capital Budgeting? Explain in brief.
2. What are the basic principles of Capital Budgeting?
3. What are the different techniques of Capital Budgeting? Classify them under the two heads- “Techniques of Capital Budgeting under Certainty” and “Techniques of Capital Budgeting under Uncertainty”.
4. What are the merits and demerits of different techniques of Capital Budgeting? Explain.
5. Draw a comparison between NPV, IRR and PI.
6. What is Modified Internal Rate of Return (MIRR)?
7. Define Risk? Explain the statistical techniques of Risk Analysis with merits and demerits.

*** ***** ***

UNIT- 4: BUDGETARY CONTROL

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Definition of Budget and Budgetary Control

4.4 Characteristics of Good Budgeting

4.5 Salient Features of Budgetary Control

4.6 Objectives of Budgetary Control

4.7 Steps in Budgetary Control

4.8 Advantages of Budgetary Control

4.9 Limitations of Budgetary Control

4.10 Classification of Budgets

4.11 Differences between Fixed and Flexible Budget

4.12 Cash budget

4.13 Performance Budgeting

4.14 Zero-Based Budgeting

4.15 Solved Problems on Flexible budget and Cash Budget.

4.16 Let Us Sum Up

4.17 Answers to Check Your Progress

4.18 Further Readings

4.19 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define Budgetary Control
- explain the features and objectives of Budgetary Control
- discuss the steps in Budgetary Control
- discuss the types of budgets
- discuss the performance budgeting
- explain the different benefits and limitation of Budgetary Control.

4.2 INTRODUCTION

A budget is generally a list of all planned expenses and revenues. It is a plan for saving and spending. In other terms, a budget is an organizational plan stated in monetary terms. A budget is a financial document used to project future income and expenses. It can be prepared by either an individual or a firm.

It is a quantified plan for future activities. It puts in black and white a quantitative plan to coordinate and control the use of resources for a specified period. It is defined as "the quantitative and financial interpretation of the future plan of operation", and as the 'overall financial plan for future activities'. It is viewed as a systematic plan for the utilization and coordination of materials, labours and other resources for the process by which plans for resource allocation are made.

4.3 DEFINTION OF BUDGET AND BUDGETARY CONTROL

The term budget is derived from the French word *bougette,* which means 'little bag' or a container of documents and accounts. A budget is an economic plan for a given period of time.

A budget is a blue print of a plan expressed in quantitative terms. Budgeting is a technique for formulating Budget. Budgetary control, on the other hand, refers to the principles, procedures and practices of achieving given objectives through budgets.

According to Brown and Howard, "Budgetary control is a system of controlling costs which includes the preparation of Budgets, co-ordinating the department and establishing responsibilities comparing actual performances with the budgeted and acting upon results to achieve maximum profitability.

Rowland and William has differentiated the three terms as: "**Budget** is the individual objective of a department etc., whereas **Budgeting** may be said to be the act of building budgets. **Budgetary Control** embraces all and in addition includes the science of planning the budget to affect an overall management tool for the business planning and control".

Budgetary control is defined by the Institute of Cost and Management Accountant (CIMA) as follows:

'The establishment of budgets relating the responsibilities of executives to the requirement of a policy, and the continuous comparisons of actual with budgeted results, either to secure by individual action the objective of the policy, or to provide a basis for its revision.'

4.4 CHARACTERISTICS OF GOOD BUDGETING

The following are the characteristics of budgeting:

a. A good budgeting should involve person at different levels while preparing the budgets. The subordinates should not feel any imposition on them.
b. There should be a proper fixation of authority and responsibility. The delegation of authority should be done in a proper way.
c. The targets of the Budgets should be realistic, if the targets are difficult to be achieved then they will be enthuse the person concerned.
d. A good system of accounting is also essential to make the budgeting successful.
e. The budgeting system should have a whole-hearted support of the top Management.



CHECK YOUR PROGRESS

Q 1: Define budget.

.....

.....

Q 2: State two characteristics of good budgeting?

.....

.....

4.5 SALIENT FEATURES OF BUDGETARY CONTROL

The salient features of a budgetary control system are the following:

a. Determining the objective to be achieved over the budget period, and the policy and policies that might be adapted for the achievement of these ends.
b. Determining the variety of activities that should be undertaken for the achievement of the stated objectives.
c. Drawing up a plan or a scheme of operation with respect to each class of activity, in physical as well as monetary terms for the full budget period and its parts.
d. Laying out a system of comparison of actual performance by each persons, section or department with the relevant budget and determination of cause for discrepancies, if any
e. Ensuring that corrective action is taken where the plan is not being achieved and, if that is not possible, for the revision of the plan.



CHECK YOUR PROGRESS

Q 3: Point out two features of budgeting control.

.....

.....

4.6 OBJECTIVES OF BUDGETARY CONTROL

Budgetary control is essential for policy planning and control. It also acts as an instrument of coordination.

The main objectives of budgetary control are as follows-:

a. To ensure planning for future by setting up various budgets. The requirements and expected performance of the enterprise are anticipated.
b. To coordinate the activities of different departments.
c. To operate various cost centers and departments with efficiency and economy.
d. Elimination of wastes and increase in profitability.
e. To anticipate capital expenditure for future.
f. To centralize the control system.

g. Correction of deviation from the established standards.

h. Fixation of responsibility of various individuals in the organizations.

4.7 STEPS IN BUDGETARY CONTROL

a. Developing Budgets: The first stage in budgetary control is developing various budgets. It will be necessary to identify the budget centers in the organization and budgets will have to be develop for each one of them. Thus, Budgets are developed for function like purchase, sale, production, manpower, cash, capital expenditure, machine hours and labour hours. The factors affecting the planning should be studied with awareness and budgets should be developed after a thorough learns of the factors.

b. Recording Actual Performance: There should be a proper system of recording the actual performance achieved. This facilitates the comparison between the budget and the actual. An efficient accounting and cost accounting system help to record the actual performance effectively.

c. Comparison of Budgeted and Actual Performances: One of the important aspects of budgetary control is the comparison between the budgeted and the actual performances. The objective of such comparison is to find out the variation between the two and provide the base for taking remedial action.

d. Decision Making: Taking appropriate corrective action on the basis of the comparison between the budgeted and actual result is the essence of budgeting. A budget is always prepared for future and hence, there may be a variation between a budgeted and actual result. There is a need of investigation of the same and take appropriate action so that the deviation will not repeat in the future. Responsibilities can be fixed on proper persons so that they can be held responsible for any such deviation.

4.8 ADVANTAGES OF BUDGETARY CONTROL

The following are the advantages of budgetary control:

a. ***Maximization of Profit***-: The budgetary control aims at the maximization of profits of the enterprise. To achieve this aim, a proper planning and co-ordination of different functions is undertaken. There is a proper control over various capital and revenue expenditures. The resources are put to the best possible use.

b. ***Coordination-*** The working of different department and sectors is probably co-ordinate. The budgets of different departments have a bearing on one another.

c. ***Specific Aims***- The plans, policies and goals are decided by the top management. All efforts are put together to reach the common goal of the organization.

d. ***Tool for measuring Performance-*** By providing targets to various departments, budgetary control provides a tool for measuring managerial performance. The budgeted targets are compared to actual results and deviation is determined.

e. ***Economy-*** The planning of expenditure will be systematic and there will be economy in spending. The finances will be put to optimum use.

f. **Determining Weakness-:** In drafting the circulars, following points should be considered: The deviation in budgeted and actual performance will enable the determination of weak spot. Efforts are concentrated on those aspects where performance is less than the stipulated.

g. **Corrective Action-**: The management will be able to take corrective measure whenever there is a discrepancy in performance. The deviation will be regularly reported so that necessary action is taken at the earliest.

h. **Consciousness-**: It creates budget consciousness among the employees. By fixing target for the employees, they are made

conscious of their responsibility. Everybody knows what he she is expected to do in the organisation.



CHECK YOUR PROGRESS

Q 4: Mention two advantages of budgetary control.

.....

.....

Q 5: Give two points of limitation of budgetary control.

.....

.....

4.9 LIMITATIONS OF BUDGETARY CONTROL

The following are the limitations of budgetary control

- ***Uncertain future-*** The budgets are prepared for the future period. Despite best estimates made for the future, the prediction may not always come true. The future is always uncertain and the situation which is presumed to prevail in future may change.
- ***Budgetary Revision Required-*** Budgets are prepared on the assumption that certain condition will prevail. Because of future uncertainties, assumed conditions may not prevail necessitating the revision of budgetary targets.
- **Target:** The common tendency of people is to achieve the target only.
- **Conflict among different departments-** Budgetary control may leads to conflict among functional departments.

4.10 CLASSIFICATION OF BUDGETS

The budgets are classified as under:

a. Classification on the basis of Time

1. **Long-term Budgets.** The budgets are prepared to depict long-term planning of the business. The period of long-term budgets varies between five to ten years. The long-term planning is done by the

top level management; it is not generally known to lower levels of management. Long-term budgets are prepared for some sector of the concern such as capital expenditure, research and development, long-term finances, etc. These budgets are useful for those industries where gestation period is long i.e. machinery, electricity, engineering, etc.

2. **Short-term Budgets.** These budgets are generally for one or two years and are in the form of monetary terms. The consumer's goods industries like sugar, cotton, textile etc, use short-term budgets.
3. **Current Budgets:** The periods of current budgets are generally of months and weeks. These budgets are related to the current activities of the business. According to I.C.W.A. London, "Current budget is a budget which is established for use over a short period of time and is related to current condition".

b. Classification on the basis of functions

1. **Operating budgets.** These budgets relate to the different activities or operation of a firm. The number .of such budgets depends upon the size and nature of business.

The commonly used operating budgets are:

a. Programme Budget
b. Responsibility Budget
c. Sales budget
d. Production Budgets
e. Production Cost Budgets etc.

Let us discuss programme budget and responsibility budget–

Programme Budget: it consist of expected revenues and cost of various products or projects that are termed as a major program me of the firm. Such a budget can be prepared for each product line or project showing revenues, cost and the relative profitability of the various programmes. They are useful in determining imbalances and inadequacies in programmes so that corrective actions may be taken in future.

Responsibility Budget: When the operating budget of a firm is

prepared in terms of responsibility areas it is called the responsibility budget. Such a budget shows the plan in the term of persons responsible for achieving them. It is used by the management as a control device to evaluate the performance of executives of various cost centres.

(2**) Financial Budget :** Financial budget is concerned with cash receipts and disbursements, working capital, capital expenditure, financial position and results of business operation. The commonly used financial budgets are:

(a) Cash Budget

(b) Working Capital Budget

(c) Capital Expenditure Budget Etc

(3) **Master budget :** According to I.C.W.A. London, 'the master budget is the summary budget incorporating its functional budget'. Master budget is prepared by the budget officer and it remains with the top level management. This budget is used to co-ordinate the activities of various functional departments and also to have as a control device.

c. Classification on the basis of Flexibility

1. **Fixed Budget**: According to I.C.W.A. London "Fixed budget is a budget which is design to remain unchanged irrespective of the level of the activity actually attends. Fixed budget is suitable under the static condition. If sales, expenses, costs can be forecasted with greater accuracy then this budget can be advantageously used.
2. **Flexible Budget**: A flexible budget is consists a series of budgets for different level of activity attained. A flexible budget is prepared after taking into consideration unforeseen changes of the conditions in the business environment.

4.12 DIFFERENCES BETWEEN FIXED BUDGET AND FLEXIBLE BUDGET

Basis	FIXED BUDGET	FLEXIBLE BUDGET
Rigidity	A fixed budget remains the same irrespective of changed situation.	A flexible budget is recast to suit the changed circumstances.
Conditions	Fixed budgets assume that conditions will remain constant.	A budget will change if level of activity varies.
Cost Classification	In fixed budgets cost are not classified according to their nature.	The costs are studied as per their nature, i.e fixed, variable, semi variable.
Forecasting	Forecasting of accurate result is difficult	Flexible budgets clearly shows the impact of expenses on operation and it helps in making accurate forecast
Cost Ascertainment	Under Change circumstances cost cannot be ascertained	The cost can be easily ascertained under different level of activity. This helps in fixing price.

4.12 CASH BUDGET

A cash budget is the combination of cash receipts and payments of a particular period. It precedes various other budgets like material budgets and research and development budget. The cash Budget is an analysis of flow of cash in a business over a future, short or long period of time. It is a forecast of expected cash intake and outlay.

The cash receipts from various sources are anticipated. The estimated cash collection for sales, debts, bills receivable, interests, dividend and other income will be taken into account. The amount to be spent on purchase of materials, payment to creditors and meeting various other revenue and capital expenditure needs should be considered. Cash forecasts will include all possible sources from which cash will be received and the channels in which payments are to be made so that a consolidated cash position is determined.

4.13 PERFORMANCE BUDGETING

Performance budget has been defined as a "budget based on functions, activities and projects." Performance budgeting may be described as the budgeting system in which input costs are related to the performance, i.e., end results. It is a system of budgeting which provides for appraisal of performance as well as follow-up measures. The main thrust of performance budgeting has been on providing output-oriented budget information within a long-range perspective so that resources could be allocated more efficiently and effectively.

The performance budget is a budget based on functions, activities and projects which focus-attention on the accomplishment, the general and relative importance of the work to be done and the service to be rendered rather than upon the means of accomplishment such as personnel, service, supplies, equipment etc. Under this system the function of organizational units would be split into programmes of activities, sub-programmes and component schemes, etc., and estimates would be presented for each. Performance budgeting seeks to establish relationship between input and their direct outputs.

According to National Institute of Bank Management, Performance Budgeting is "The process of analyzing identifying, simplifying and crystallizing specific performance objective of a job to be achieved over a period, in the framework of the organizational objective, the purposes and objective of the job. The technique is characterized by its specific direction towards the business objective of the organization.

Performance budgeting involves (i) development of performance criteria of various programmes. (ii) assessment of performance of each programme and by each responsibility unit. (iii) comparison of actual performance with the budget; and (iv) undertaking periodic review of the programme with a view to make modification as required.

Performance budgeting is a programme of action for any given year with specific indicators regarding tasks, the means of achieving them and the cost of achieving them. Performance budgeting, therefore, involves the development of more refined management tools, such as work measurement, performance standards, unit costs, etc.

Objectives:

The objectives of performance budgeting are as follows:

1. Correlate the physical and financial aspects of programmes and activities;
2. Improve budget formulation, review and decision-making at all levels of management in the government machinery;
3. Facilitate better appreciation and review by the legislature;
4. Make possible more effective performance audit;
5. Measure progress towards long-term objectives as envisaged in the plan; and
6. Bring annual budgets and developmental plans together through a common language.

Features of Performance Budgeting: Features of performance budgeting are as follows:

(i) Whole operations are defined and classified by functions, programmes and activities.
(ii) It is based on output oriented budget.
(iii) It laid emphasis on accomplishment rather than on the means of accomplishment.
(iv) It establishes relationship between output and input.
(v) It operates within the framework of clearly defined objectives.

Steps in implementation:

Following steps are involved in the introduction of performance budgeting:

(i) Establishing a meaningful classification of public expenditure in terms of functions,
(ii) The establishment, improvement and extension of activity schedules for all measurable activities of the government;
(iii) The establishment of work output, employee utilization, standard or unit costs by objective methods, i.e. bringing the system of accounting and financial management into accord with the classification; and
(iv) The creation of related cost and performance recording and reporting system.

Illustration 1:

Z ltd. had a profit plan approved for selling 5,000 units per month at an average price of Rs. 10 per unit. The budgeted variable cost of production was Rs. 4 per unit and the fixed costs were budgeted at Rs. 20,000, the planned income being Rs. 10,000 per month. Due to shortage of raw-materials, only 4,000 units could be produced and the cost of production increased by .50 paise per unit. The selling price was raised by Re.1.00 per unit. In order to improve the production process, an expenditure of Rs. 1,000 was incurred for research and development activities.

You are required to prepare a Performance Budget and a Summary Report.

Solution:

Z Ltd.

Performance Budget

Particulars	**Original plan Rs.**	**Adjusted plan Rs.**	**Actual Position Rs.**
Sales Revenue	50,000	40,000	44,000
Variable Costs	20,000	16,000	18,000
Contribution	30,000	24,000	26,000
Fixed Costs	20,000	20,000	21,000
Net Income	10,000	4,000	5,000

SUMMARY REPORT

	Rs.
Planned Income	10,000
(i)Selling price variance (4000 x (11-10)=4,000 (Favourable)	
(ii)Variable cost variance (4000 x (4-4.0)=4,000 (Adverse)	
(iii)Fixed cost variance (21,000 – 20,000)=1,000 (Adverse)	
(iv)Profit Volume Variance 1000 x 6 = 6,000 (Adverse)	
Total Variance	5,000
Actual Income	5,000

4.14 ZERO-BASED BUDGETING

Zero-based budgeting is method of budgeting whereby, all activities are revaluated each time budget is formulated and every time of expenditure in the budget is fully justified. Thus, the Zero Based Budgeting involves from scratch or zero.

Besides adopting a 'Zero-Based' approach, the zero-based budgeting also focuses on programmes or activities instead of functional department based on line items, which is a feature of traditional budgeting. It is an extension of Programme budgeting. In programme budgeting, programmes are identified and goals are developed for the organization for the particular programme. By inserting decision packages in the systems and ranking the packages, the analysis is strengthened and priorities are determined.

4.15 SOLVED PROBLEMS ON FLEXIBLE BUDGET AND CASH BUDGET

Illustration 2:

The Expenses for the production of the production of 5000 units in a factory are given as follows-:

PARTICULARS	Per Unit
Materials	50
Labour	20
Variable Overheads	15
Fixed overheads(Rs.50000)	10
Administrative expenses (5% variable)	10
Selling Expense(20% fixed)	6
Distribution Expenses(10% fixed)	5
Total Cost of Sales per unit	116

You are required to prepare a Budget for the production of 7000 units.

Solution-

FLEXIBLE BUDGET				
PARTICULARS	Output 5000 units		Output 7000 units	
	Per unit	Amount	Per unit	amount
Materials	50.00	250000	50.00	350000
Labour	20.00	100000	20.00	140000
Prime cost	70.00	350000	70.00	490000
Factory overhead				
Variable overhead	15.00	75000	15.00	105000
Fixed overhead	10.00	50000	7.14	50000
Works cost	95.00	475000	92.14	645000
Administrative expenses	10.00	50000	7.28	51000
Cost of Production	105.00	525000	99.42	696000
Selling &distribution overhead				
Selling expenses	6.00	30000	5.66	39600
Distribution Expenses	5.00	25000	4.86	34000
Cost of Sales	116.00	580000	109.94	769600

Illustration-3:

The following information at 50% capacity at given. Prepare a flexible budget and forecast the profit or loss at 60%, 70% and 90% capacity.

Expenses at 50% capacity

Fixed Expenses:	
Salaries	50,000
Rent and taxes	40,000
Depreciation	60,000
Administrative Expenses	70,000
Variable Expenses:	
Material	2,00,000
Labour	2,50,000
Others	40,000

Semi – Variable expenses:

Repairs	1,00,000
Indirect labour	1,50,000
Others	90,000

It is estimated that fixed expenses will remain constant at all capacities. Semi – variables expenses will not change between 45% and 60% capacity, will rise by 10% between 60% and 75% capacity, a further increase of 5% when capacity crosses 75%.

Estimate sales at various levels of capacity are:

Capacity	Sales (Rs)
60%	11, 00,000
70%	13, 00,000
90%	15, 00,000

Solution:

Flexible Budget

Illustration 4:

	Capacities at different levels			
Particulars	50%	60%	70%	90%
	Rs	Rs	Rs	Rs
Fixed Expenses :				
Salaries	50,000	50,000	50,000	50,000
Rent And taxes	*40*,000	40,000	40,000	40,000
Depreciation	60,000	60,000	60,000	60,000
Administrative expenses	70,000	70,000	70,000	70,000
Variable Expenses:				
Materials	2,00,000	2,40,000	2,80,000	3,60,000
Labour	2,50,000	3,00,000	3,50,000	4,50,000
Others	40,000	48,000	56,000	72,000
Semi- variable expenses:				
Repairs	1,00,000	1,00,000	1,00,000	1,15,000
Indirect labour	1,50,000	1,50,000	1,65,000	1,72,000
Others	90,000	90,000	99,000	1,03,000
Total cost				
Profit (+) or loss(-)				
Estimated Sales	10,50,000	11,48,000	12,80,000	14,93,000
		(48,000)	20,000	(7,000)
		11,00,000	13,00,000	15,00,000

With the following data for a 60% activity, prepare a budget for production at 80% and 100% capacity:

Production at 60% activity (600 units)

Materials	Rs. 100 per unit
Labours	Rs. 40 per Unit
Direct Expenses	Rs. 10 per unit
Factory overheads	Rs. 40,000 (40% fixed)
Administration Expenses	Rs. 30,000 (60% fixed)

Solution:

Flexible Production Budget

Flexible Production Budget						
	60% capacity 600 Units		80 % Capacity 800 Units		100 % Capacity 1,000 Units	
	Unit cost Rs.	Total Cost Rs.	Unit cost Rs.	Total Cost Rs.	Unit cost Rs.	Total Cost Rs.
Materials	100	60,000	100	80,000	100	1,00,000
Labour	40	24,000	40	32,000	40	40,000
Direct Expenses	10	6,000	10	8,000	10	10,000
Prime Cost	150	90,000	150	1,20,000	150	1,50,000
FactoryOverheads: Fixed (40% of Rs.40,000)	26.67	16,000	20	16,000	16	16,000
Variables	40.00	24,000	40	32,000	40	40,000
Works costs	216.67	1,30,000	210	1,68,000	206	2,06,000
Administrative Expenses: Fixed : (60% of	10.00	18,000	22.50	18,000	18	18,000
Rs.30,000) Variables	20.00	12,000	20.00	16,000	20	20,000
Total Costs	266.67	1,60,000	252.50	2,20,000	244	2,44,000

CASH BUDGET:

Illustration 5:

A company is expecting to have Rs. 25000 cash in hand on 1st April 2017 and it requests you to prepare cash budgets for the three months. April to June 2017. The Following information is supplied to you:

MONTH	SALES	PURCHASES	WAGES	EXPENSES
February	70000	40000	8000	6000
March	80000	50000	8000	7000
April	92000	52000	9000	7000
May	100000	60000	10000	8000
June	120000	55000	12000	9000

Other information:

a. Period of credit allowed by suppliers is two months.
b. 25% of sales are for cash and the period of credit allowed to customers for credit sales is one month.
c. Delay in payment of wages and expenses one month.
d. Income tax 25000 is to be paid in June 2017

Solution:

Cash budget for three months ending June 2017



4.16 LETS US SUM UP

After going through the unit we have come through the following:

- The various features of Budgetary Control
- The objectives of Budgetary Control
- The differences between fixed budget and flexible budget.
- The various types of budgets
- The advantages and the disadvantages of Budgetary Control
- The details of performance budgeting.



4.17 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q.No.1:

A budget is a financial document used to project future income and expenses. It can be prepared by either an individual or a firm.

Answer to Q.No.2:

1. A good system of accounting is also essential to make the budgeting successful.
2. The budgeting system should have a whole-hearted support of the top Management

Answer to Q.No.3:

a. Determining the variety of activities that should be undertaken for the achievement of the stated objectives.
b. Ensuring that corrective action is taken where the plan is not being achieved and, if that is not possible, for the revision of the plan.

Answer to Q.No.4:

a. Maximization of Profit.
b. Co-ordination.

Answer to Question No.5:

a. Conflict among different departments.
b. Uncertain Future.



4.18 FURTHER READING

1. Stategic Management Accounting (Theory and Practice) - By V.K.Kumar
2. Cost and Management Accounting- By Shashi K. Gupta and Sharma.
3. Cost and Management Accounting – By M.C.Shukla.
4. Cost Accounting (Principles and Practice) –By M.N.Arora
5. Management Accounting- By Paresh Shah

4.19 MODEL QUESTIONS

Q 1: Define budget.

Q 2: Define budgetary control.

Q 3: Discuss the steps in budgetary control.

Q 4: Differentiate between fixed budget and flexible budget.

*** ***** ***

UNIT 5: ZERO-BASED BUDGETING

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Features of Zero-Based Budgeting

5.4 Steps in Zero-Based Budgeting

5.5 Advantages of Zero-Based Budgeting

5.6 Limitations of Zero-Based Budgeting

5.7 Process of Zero-Based Budgeting

5.8 Differences between Zero-Based Budgeting and Traditional Budgeting

5.9 Let Us Sum Up

5.10 Answers to Check Your Progress

5.11 Further Reading

5.12 Model Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define Zero-based budgeting
- explain the features in Zero-based budgeting
- explain the Steps involved in Zero-based budgeting
- discuss the advantages and the limitations of Zero-based budgeting
- explain the process involved in Zero-based accounting

5.2 INTRODUCTION

This unit discusses the concept of Zero-based budgeting. Zero-base budgeting is a planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch (hence zero-base) and shifts the burden of proofs to each manager to justify why he should spend any money at all. In this system, all activities are analysed in decision package, which are evaluated and ranked in order of

performance. Thus, it is considered as a method of budgeting whereby all activities are revaluated each time a budget is formulated and every item of expenditure in the budget is fully justified.

It is stated that Zero-based budgeting may be defined as a process which requires the manager to justify his entire budget request in details starting from the ground level.

CIMA has defined it as, “A method of budgeting whereby al activities are revalued each time a budget is set. Discrete levels of each activity are valued and a combination choosen to match funds available.”

In zero-based budgeting, a budget is prepared as if it is being prepared for new company for the first time. Zero is taken as a base as the name goes and taking zero as a base, a budget is developed on the basis of likely activities for the future period. The budget for the year has to be justified according to the present situation.

Thus, Zero-based budgeting affords a choice among the alternatives so that the activities would be settled in the order of their importance.

5.3 FEATURES OF ZERO BASE BUDGETING

The following are the main features of Zero-based budgeting:

1. Zero-based budgeting is a technique of planning and Budgeting Process.
2. It starts with Zero by assuming that earlier budget has lost its utility.
3. It requires cost benefit analysis.
4. Each manager has to justify the requirements for new provision.
5. Zero-based budgeting deals with alternatives. Activities are settled in order of their importance.



CHECK YOUR PROGRESS

Q 1: Define Zero-based Budgeting.

……

……

Q 2: State two featurers of Zero-based Budgeting.

……

……

5.4 STEPS IN ZERO-BASED BUDGETING

The following steps are generally involved in Zero-based budgeting:

1. The objective of budgeting should first be determined. When the objective is clear, their efforts will be made to achieve them. So, the first step will decide the objective, after which other steps will be possible.
2. To what extent Zero-based budgeting is to be applied, should be decided. Whether for all operational areas or it should be applied in some areas only should be decided beforehand.
3. Describing and analysing all current and proposed programmes usually called 'Decision Packages' is the next step. A 'decision package' is a document that identifies a specific activity in such a manner that management can evaluate and rank it against other activities competing for limited resources, and decide whether to approve or disapprove it.
4. Decision units are the lowest level programmes or organisational equity for which budgets are prepared.
5. The next step is cost and benefit analysis should be undertaken. Only those projects should be taken first where benefit is more as compared to the cost involved. It will help in fixing priority for various projects on the basis on their utility and ranking of decision packages; and
6. Lastly, the step involved is concerned with selecting, approving decision packages and finalising the budget.

5.5 ADVANTAGES OF ZERO-BASED BUDGETING

Zero-based budgeting (ZBB) is a revolutionary concept and is relatively a new management tool for planning and control of activities.

The plans and budgets based upon ZBB are much improved than those based upon Traditional Budgeting. There are a number of benefits of which some are described below:

a. In, ZBB all activities included in the budget are justified on cost benefit considerations which promote more effective allocation of resources. A list of priorities is prepared and cost benefit analysis will be the guiding principle in fixing the priority.
b. ZBB improves efficiency of the management. Every manager will have to justify the demand for resources. Only those activities will be undertaken which will have justification and will be essential for the business.
c. In the course of ZBB process, inefficient and loss making operations are identified and may be removed.
d. It adds psychological push to employees to avoid wasteful expenditure.
e. Cost behaviour patterns are more closely examined, emphasis will be given to the economical activities and alternative courses of action will also be studied.
f. It is an educational process and can promote a management team of talented and skilful people who tend to promptly respond to changes in the business environments.
g. Budgeting will be related to organisational goals. Something will not be allowed on the plea that it was done in the past. Only those things will be allowed which will help in realising organisational goals.



CHECK YOUR PROGRESS

Q 3: Mention one advantage of Zero-Based Budgeting.

……

……

5.6 LIMITATIONS OF ZERO BASE BUDGETING:

The limitations of Zero-Based Budgeting are as follows:

a. Costs of operating Zero-based budgeting are very high.
b. More efforts are required involving volume of additional paper works which results in high cost of preparing budgets every year.
c. Ranking of decision packages and allocation of resources may be subjective to some degree resulting in departmental conflict.
d. Zero-based budgeting is very time consuming.
e. Computation of cost-benefit analysis is not possible when it is used in non-financial matters.
f. It has no scope for adjustment when there are unexpected changes in situation, therefore flexible budgeting is not possible.
g. Managers may resist new ideas and changes. They may feel threatened by ZBB because all expenditures are questioned and need to be justified.
h. For introducing ZBB, managers need to be given proper training and education regarding this new concept, its pros and cons and implementation.

5.7 DIFFERENCES BETWEEN ZERO-BASED BUDGETING AND TRADITIONAL BUDGETING

Basis of difference	**Zero-Base Budgeting**	**Traditional Budgeting**
1. Emphasis	It is decision oriented.	It depends on past data so it is more accounting oriented.
2. Approach	Main approach is towards achievement of objectives	Its approach is monitoring toward expenditures.
3. Focus	Its focus is on cost benefit analysis.	Its focus is on increase or decrease in expenditures over the past.

4. Communication	It includes both vertical and horizontal communication.	Communication is usually vertical.
5. Methods	Its preparation is based upon selection of decision package in view of cost benefit analysis	The method of preparation of traditional budget is bass upon extrapolation.



CHECK YOUR PROGRESS

Q 4: Mention two limitations of Zero Base Budgeting?

……

……



5.8 LETS US SUM UP

After going through the unit we have come through the following:

- The various features of Zero-based budgeting
- The steps in Zero-based budgeting
- The advantages and the limitations of Zero-based budgeting
- Differences between Zero-based budgeting and traditional budgeting.



5.9 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q. No.1:

"A method of budgeting whereby al activities are revalued each time a budget is set. Discrete levels of each activity are valued and a combination choosen to match funds available."

Answer to Q.No.2:

1. Zero Base Budgeting is a technique of planning and Budgeting Process.
2. It stats with zero by assuming that earlier budget has lost its utility.

Answer to Q.No.3:

a. ZBB improves efficiency of the management. Every manager will have to justify the demand for resources. Only those activities will be undertaken which will have justification and will be essential for the business.

Answer to Q.No.4:

a. Costs of operating Zero-based budgeting are very high.

b. ZBB is very time consuming.



5.10 FURTHER READING

1. Stategic Management Accounting (Theory and Practice) - By V.K.Kumar
2. Cost and Management Accounting- By Shashi K. Gupta and Sharma.
3. Modern Cost and Management Accounting – By M.Hanif
4. Cost Accounting (Principles and Practice) –By M.N.Arora
5. Management Accounting- By Paresh Shah



5.11 MODEL QUESTIONS

1. What is Zero-Based Budgeting?
2. What are the benefits of Zero-Based Budgeting?
3. Write the differences between Zero-Based Budgeting and Traditional Budgeting.
4. Explain three limitations of Zero-Based Budgeting.
5. What are the steps involved in ZBB?

*** ***** ***

UNIT 6: RESPONSIBILITY ACCOUNTING

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Fundamental Aspects of Responsibility Accounting

6.4 Principles of the Responsibility Accounting

6.5 Characteristics of Responsibility Accounting

6.6 Advantages of Responsibility Accounting

6.7 Process of Responsibility Accounting

6.8 Steps involved in Responsibility Accounting

6.9 Difficulties encountered in Introducing Responsibility Accounting

6.10 Responsibility Centre

6.11 Characteristics of Responsibility Centre

6.12 Types of Responsibility Centres

6.13 Objectives of Responsibility Performance Reporting

6.14 Let Us Sum Up

6.15 Answers to Check Your Progress

6.16 Further Reading

6.17 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define Responsibility Accounting
- discuss the steps involved in Responsibility Accounting
- state the objectives of Responsibility Accounting
- discuss the advantages of Responsibility Accounting
- outline the Responsibility Cost centres- Cost, Profit and Investment centres
- discuss the various objectives of responsibility performance reporting.

6.2 INTRODUCTION

This unit discusses the concept of Responsibility Accounting. It is the accounting system of control through which the responsibilities are assigning towards the control of cost. Persons are made responsible for costs. Proper authority is given to the persons so that they are able to keep their performance. In case the performance is not according to the pre-determined standards then the persons who are assigned duties will be responsible personally. In this system of accounting the emphasis is on men rather than on systems. For eg: If Mr. A, the manager of the department, prepares the cost budget of his department, then he will be made responsible for keeping the budgets under control. Mr. A will be supplied with full information of costs incurred by his department. In case the costs are more than the budgeted costs, then Mr. A will try to find out reasons and take necessary corrective measures. Mr. A will be personally responsible for the performance of his department.

It generates information on the basis of managerial responsibility, allowing information to be used directly in motivating and controlling the action of each manager in charge of a responsibility centre. Planning and controlling are essential for achieving good results in any business. First, a budget is prepared and then actual results are compared with the budgeted ones. Any difference is made the responsibility of the key individuals who were involved in setting standards, given necessary resources and powers to use them.

Responsibility accounting helps managers to trace costs, revenues, and profits in order to enable them to arrive at the right decision. It also provides costing information about controllable costs to the manager of the responsibility centre. Responsibility accounting focuses on people who participate actively in the planning process and thereby helps the management in cost-control through the budgeting process.

The basic idea is that large diversified organisations are difficult, if not possible to manage as a single segment hence they must be decentralised into manageable segments. These segments are referred

as responsibility centres, i.e. cost centres, profit centres, investment centres, and revenue centres. This method allows responsibility to be assigned to the segment managers that have the greatest amount of influence over the key elements to be managed. These elements include revenue centre which mainly generates revenue with relatively little costs. Cost centre that generates costs but no revenue. Profit centre that generates both revenue and cost. And finally in investment centre, the manager controls the acquisition and utilisation of assets as well as revenue and costs.

Responsibility accounting, the emphasis is on men rather than on machines. It is a system of control where responsibility is assigned for the control of costs. The persons are made responsible for the control of costs. The responsibility of the persons at the responsibility centres is to find out the reasons for variance between the budgeted and the actual performance.

6.3 FUNDAMENTAL ASPECTS OF RESPONSIBILITY ACCOUNTING

Some of the fundamental aspects or the features of Responsibility Accounting are discussed below:

1. Inputs and Outputs: The physical resources utilised in an organisation such as quantity of raw materials used and labour hours consumed, are termed as inputs. These inputs expressed in the monetary terms are known as costs. Similarly, outputs expressed in monetary terms are called revenues. Thus responsibility accounting is based on cost and revenue information.
2. Planned and actual information: Effective responsibility accounting requires both planned and actual financial information. It is not only the historic cost which is important but also the planned future data which is essential for the implementation of responsibility accounting system. The use of fixed budgets, flexible budgets and profit planning are all incorporated into one overall system of responsibility accounting.
3. Identification of Responsibility Centres: The responsibility centre represents the sphere of authority or decision points in an

organisation. The whole concept of responsibility accounting is focused around identification of responsibility centre. A responsibility centre is under control of an individual who is responsible for the control of activities of that sub-unit of the organisation. Again, for effective planning and control these responsibility centres are divided under three categories: Cost centre, Profit Centre and Investment Centre.

4. Transfer Pricing Policy: The significance of the transfer price can be well judged from the fact that for the transferring division it will be a source of revenue, whereas for the division to which the transfer is made it will be an element of cost. Thus, there is a need of a proper transfer policy for the successful implementation of responsibility accounting system.
5. Participative management: The function of responsibility accounting becomes more effective if participative style of management is followed, wherein standards are fixed according to the mutual consent, and decisions are reached after consulting subordinates.
6. Performance Reporting: For effective control it is necessary that deviations if any, from the plans must be reported at the earliest so that corrective action can be taken timely. This can be known only when performance is reported. Therefore, responsibility accounting system is focussed on performance reports also known as responsibility reports, prepared for each responsibility units. The reports should be made simple and clear, use of diagrams, charts, graphs and tables may be made to make them attractive and understandable.
7. Management by exception: An effective responsibility accounting must provide management by exception, i.e., it should focus attention of the management on significant deviations and not burden them with all kinds of routine matters but condensed reports requiring their attention must be sent to them particularly at higher levels of management.



CHECK YOUR PROGRESS

Q 1: Define Responsibility Accounting.

.....,,,,,.....

.....

Q 2: State two features of Responsibility Accounting.

.....

.....

6.4 PRINCIPLES OF RESPONSIBILITY ACCOUNTING

Responsibility accounting refers to the principles, practices and procedures, under which costs and revenues are classified according to the persons responsible for incurring the costs and generating the revenues. Thus, responsibility accounting is based on the basic principles that an executive will be held responsible only for those acts over which he has a control.

Responsibility accounting follows the basic principles of any system of cost control like budgetary control and standard costing. It differs only in the sense that it lays emphasis on human beings and fixes responsibilities for individuals. The principles of responsibility accounting are as follows:

a. Determination of responsibility centre.
b. A target is fixed for each responsibility centre.
c. Actual performance is compared with the target.
d. The variances are analysed so as to fix the responsibility of centres.
e. Corrective action is taken by the higher management and is communicated to the individual responsible.
f. Offer incentive as inducement.
g. Report to individual responsible for action.
h. A suitable Transfer Pricing Policy should be followed to get the desired result.
i. All apportioned costs and policy costs are excluded in determining the responsibility for costs because an individual manager has no control over these costs.

6.5 CHARACTERISTICS OF RESPONSIBILITY ACCOUNTING

1. The organisation is divided into various responsibility centres.
2. The objectives of responsibilities for each centre are set.
3. The actual performance is recorded.
4. Cost centres are put under certain persons and adequate authority is delegated to them.
5. The variances are ascertained and concerned executives are held responsible for controlling the costs of their centre, when actual and budgeted figure are taken into consideration.
6. The performance is constantly compared to the standards set and it is useful in exercising cost control.

6.6 ADVANTAGES OF RESPONSIBILITY ACCOUNTING

Responsibility accounting is used as a control device by the management. It is basically used to evaluate the performance of executives who are in charge of the cost centres. Their performance is compared with the targets and thereby actions are taken for low results. The advantages are therefore discussed below:

1. Assigning of Responsibility: Every person in the organisation is assigned with a work and they are entitled to do it. The responsibility can be easily identified and their performances whether satisfactory or not are known. Nobody can transfer their responsibility onto others, if something goes wrong, as responsibility is assigned individually.
2. Helpful in cost planning: Here, full information is collected about revenue and costs. This data is helpful in planning of future costs and revenues, fixing of standards and preparing of budgets.
3. Improves performances: The assigning of tasks to the persons is also a motivational factor where every individual is aware that their performance will be reported to the top management. So, they will

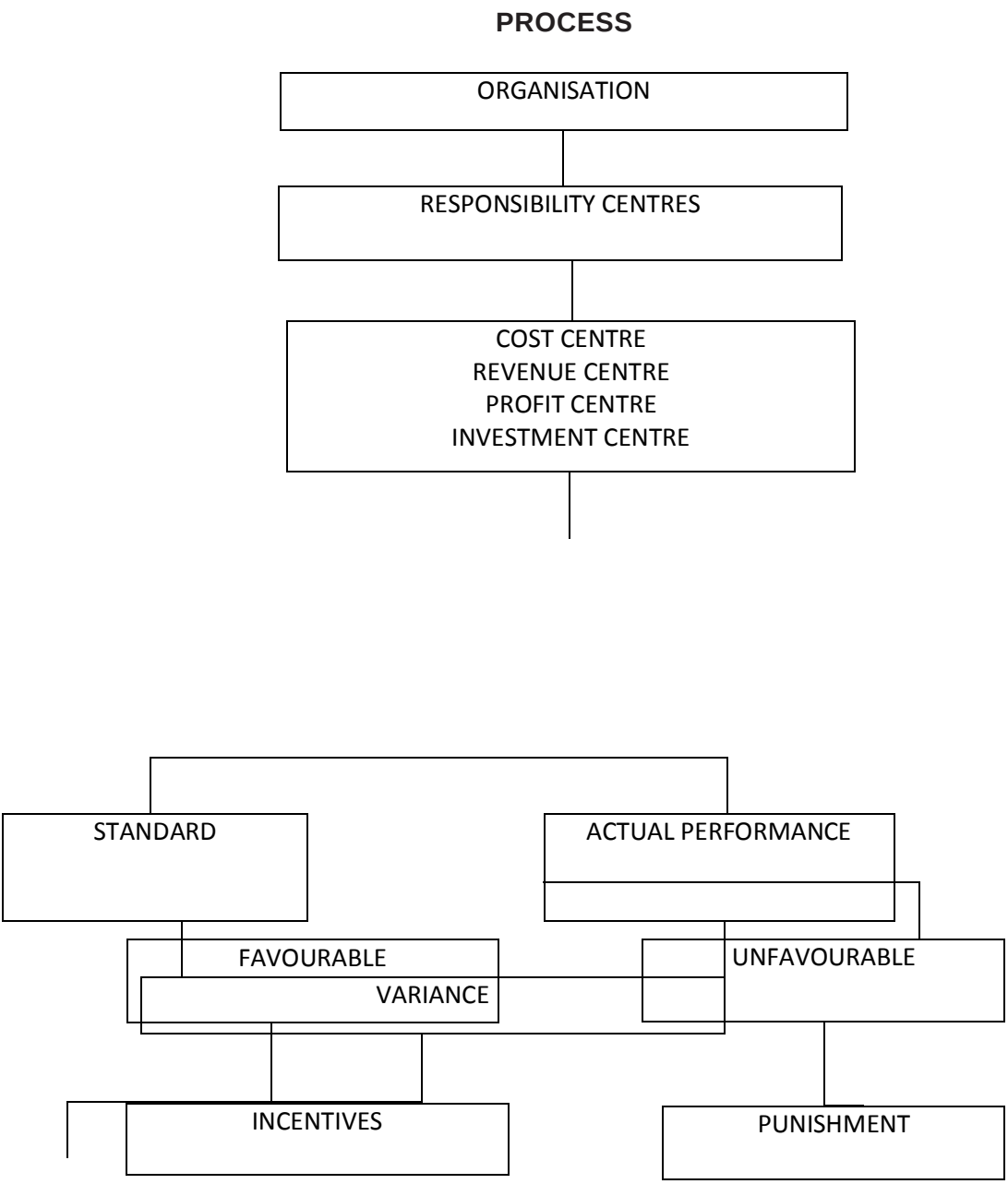
definitely try to improve their performance and it also acts as a deterrent for low performances as people have to explain for their low performances or deviations for which they are responsible.

4. Delegation and control: Responsibility accounting enables the management to delegate the authority while retaining the control. As the responsibilities of the persons are assigned it becomes easy in controlling their work. The control is in the hands of the top management because the performance of every cost centre is timely reported to them. So, the management is able to delegate the responsibility and at the same time retain control.
5. Helpful in decision making: this system is not only a control device but also helpful in decision making. It is helpful for the management in taking future decisions and actions. The past performances of various cost centres also help in fixing their future targets. Therefore, it enables the management to take proper decisions.
6. Simplification: It simplifies the structure of reports and facilitates the prompt reporting because of exclusion of those items which are beyond the scope of individual responsibility.

   Therefore, it can be concluded that the technique of responsibility accounting is helpful for all organisation Big, Small, Profit and Non-profit, Government and Non-Governmental Organisations etc. It must also be remembered that it can never be a substitute for a good management as it is merely a tool to be used effectively by the management.

6.7 PROCESS OF RESPONSIBILITY ACCOUNTING

Responsibility is an accounting process which reports as to how well managers of responsibility centres have fulfilled their responsibility. Thereby, the process of this accounting is given below:



6.8 STEPS INVOLVED IN REPONSIBILITY ACCOUNTING

The main aim of responsibility accounting is to help management in achieving organisational goals. The following are the steps involved in responsibility accounting;

1. The organisation is divided into various responsibility centres and each centre is put under the charge of a responsibility manager

who is responsible for the performance of their departments.

2. Targets are set in consultation with the manager of the centre so that he may be able to give full information about his department. The goals are properly communicated to them.
3. The actual performance are recorded and communicated to the executive concerned. The actual performance is compared with the goals set and it helps them in assessing the work of these centres.
4. If the actual performance of any department is less than the standard set, then variances if any are conveyed to the top management.
5. Timely action is taken to take necessary corrective measures so that the work does not suffer in future. The direction of the top management is conveyed to the centre concerned so that corrective action is taken at the earliest.

The main purpose of all these steps is to assign responsibility to different individuals so that the performance is improved. Therefore responsibility accounting will certainly act as a control device and it will help in improving the overall performance of the business.

6.9 DIFFICULTIES ENCOUNTERED IN INTRODUCING RESPONSIBILITY ACCOUNTING

The following are the difficulties encountered in introducing Responsibility Accounting:

1. For a successful responsibility accounting schemes (i.e., a well defined organisation structure, proper delegation of work, proper allocation costs, etc) are absent and makes it difficult to have a responsibility accounting.
2. It becomes difficult to have a further analysis of expenses than provided by traditional classification of expenses.
3. While introducing the system supervisory staff may require additional classification especially in the responsibility reports. They must be explained properly the purpose and benefits of the new system.



CHECK YOUR PROGRESS

Q 3. Mention one characteristic of Responsibility Accounting.

.....

.....

Q 4: State two Principles of Responsibility Accounting.

.....

.....

6.10 RESPONSIBILITY CENTRE

It is very difficult to supervise the activities of a large firm by an individual. Therefore, a large firm is divided into some segments like divisions or departments. Each segment has certain activities to perform; its manager is assigned specific authority and responsibility to carry-out those activities and is held responsible for his actions and decisions affecting those activities. The units of an organisation for the purpose of control are called Responsible Centres.

According to Anthony, “A responsibility centre is like an engine in that it has inputs, which are physical quantities of material, hours of various types of labour, and a variety of services; it works with these resources usually; working capital and fixed assets are also required. As a result of this work, it produces output, which are classifies either as goods, if they are tangible or as services, if they are intangible. These goods or services go either to other responsibility centres within the company or to customers in the outside world.”

6.11 CHARACTERISTICS OF RESPONSIBILITY CENTRE

Responsibility Centres have the following characteristics:

a. Each responsibility centre has inputs like material, labour and services.

b. Responsibility centre produces outputs- goods or services.

c. Responsibility centres requires working capital and fixed assets.

d. Goods produced in one responsibility centre are transferred to another responsibility centre within the company or to the outside customers.

Responsibility accounting is used to measure both inputs and outputs. Inputs of responsibility centre are measure as costs. Outputs i.e. goods and services are measured as revenues. It is easy to measure the value of revenues when goods and services are sold to the outsiders, but it is difficult to measure when outputs are used within the organisation. Therefore a number of approaches can be followed like: Market price, Cost based price, and Full Cost Price.



CHECK YOUR PROGRESS

Q 5: Mention two difficulties in Responsibility Accounting.

.....

.....

Q 6: State four advantages of Responsibility Accounting.

.....

.....

6.12 TYPES OF RESPONSIBILITY CENTRE

For the purpose of evaluating financial performance and control, the responsibility centres are generally divided into three categories:

1. Cost Centre: Cost centres are the segments in which the managers are responsible for costs incurred but have no revenue responsibilities. A cost centre is the centre where inputs are measured in monetary terms. However, when we can measure only the expenses or costs incurred and not the revenue earned from a responsibility centre, it is known as Cost or Expense centre.

The performance of the cost centre will be judged in terms of quantity used in producing a given output. A comparison between the actual and the budgeted inputs is made to determine the variances which represent the efficiency of the cost centre.

Advantages:

a. Each cost centre can control the cost.

b. Cost centre increases the efficiency of the operation.

Limitation:

a. It ignores output measured in financial terms.

b. Cost centre manager is not responsible for common costs, which is common in the organisation.

2. Profit Centre: Responsibility Centres may have both inputs and outputs. The inputs are taken as costs and outputs are taken as revenues. Managers of profit centres have control over both the costs and the revenues because profit is the difference between the revenues and the costs. The main aim of this centre is to earn profit.

   A division of the company which produces and markets the products may be called a profit centre.

   Advantages:

   a. Profit centre manager is motivated to make decision about inputs and outputs.

   b. There is accountability for the transfer of goods to another department or selling to the outsiders.

3. Investment Centre: An investment centre is an entry segment in which a manager can control not only revenues and costs but also investment. The manager is made responsible for proper utilisation of the assets used in his centre. When only top management takes the decision regarding the capital expenditure decision i.e. Capital budgeting decision there will be only one investment centre covering the entire organisation. Whereas when such decision making is delegated to the divisional heads, there will be more number of investment centres. Therefore, all the investment centres are

normally profit and cost centres, but not all profit centres are investment centres.

6.13 OBJECTIVES OF RESPONSIBILITY PERFORMANCE REPORTING:

The main objectives of Responsibility performance reporting are:

1. To determine the degree of performance in the area of responsibility for which the concerned responsibility centre's manager is directly responsible and
2. To formulate measures to improve the performance of the Responsibility Centre's manager after ascertaining the deviation of the actual performance from the budgeted performance.

   The reports can be responsibility reporting for cost centres and profit centres. These reports contain items and information which are required by the concerned Responsibility Centre manager and which are within his responsibility area. Responsibility Accounting Reports for profit centres are normally in the form of income statements.



CHECK YOUR PROGRESS

Q 7: State two characteristics of Responsibility Centre.

.....

.....

Q 8: Mention the different types of Responsibility Centre.

.....

.....



6.14 LETS US SUM UP

After going through the unit we have come through the following:

- The various features and objectives of responsibility accounting

- The advantages of the responsibility accounting
- Various steps involved in this accounting
- The different responsibility centres and their characteristics
- The process involved in responsibility accounting



6.15 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q. No.1:

Responsibility Accounting is the accounting system of control through which the responsibilities are assigning towards the control of cost.

Answer to Q.No.2:

1. Inputs and Outputs or Costs and Revenues.
2. Identification of Responsibility centres.

Answer to Q. No.3:

1. The organisation is divided into various responsibility centres.

Answer to Q.No.4:

a. Determination of responsibility centre.
b. Actual performance is compared with the target.

Answer to Q.No.5:

1. Proper delegation of work is absent.
2. It becomes difficult to have a further analysis of expenses than provided by traditional classification of expenses.

Answer to Q.No.6:

1. Assigning of Responsibility.
2. Helpful in cost planning.
3. Improve performances.
4. Delegation and control.

Answer to Q.No.7:

a. Each responsibility centre has inputs like material, labour and services.
b. Responsibility centre produces outputs- goods or services.

Answer to Q.No 8:

1. Cost Centre
2. Profit Centre
3. Investment Centre



6.16 FURTHER READING

1. Stategic Management Accounting (Theory and Practice)- By V.K.Kumar
2. Cost and Management Accounting- By Shashi K. Gupta and Sharma.
3. Modern Cost and Management Accounting – By M.Hanif
4. Cost Accounitng (Principles and Practice) –By M.N.Arora.
5. Management Accounting- By Paresh Shah.

6.18 MODEL QUESTIONS

1. What is Responsibility accounting?
2. Define responsibility centre.
3. What is the function of cost centre?
4. What is the aim of Responsibility accounting?
5. Name the various types of responsibility centres.
6. Discuss the various steps involved in Responsibility accounting.
7. What are the objectives of Responsibility accounting?
8. Responsibility accounting is an important device for control. Explain.
9. What are the advantages of Responsibility accounting?
10. How far the responsibility centres helpful to the management?

objective type questions (True or False)

1. Responsibility accounting is also known as profitability accounting.
2. Responsibility centres are usually classified into four classes.
3. Profit centre is responsible for maximising the profit of the centre.

4. Responsibility accounting is a very old technique of control.
5. Responsibility accounting is used as a control device.
6. Responsibility accounting is a part of internal reporting system.
7. Input is concerned with cost centre.
8. Responsibility accounting also helps in cost planning and decision making.

Answers:

TRUE- 1,3,5,6,7,8 FALSE- 2,4,

*** ***** ***

UNIT 7: TRANSFER PRICING

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Definition of Transfer Pricing

7.4 Features of Transfer Pricing

7.5 Need of Transfer Pricing

7.6 Objectives of Transfer Pricing

7.7 Advantages of Transfer Pricing

7.8 Limitations of Transfer Pricing

7.9 Transfer Pricing Methods

7.10 International Transfer Pricing

7.11 Factors Affecting Fixation of Transfer Pricing

7.12 Let Us Sum Up

7.13 Answers to Check Your Progress

7.14 Further Reading

7.15 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- define Transfer Pricing
- discuss the features and objectives of Transfer Pricing
- explain the factors affecting Fixation of Transfer Pricing
- discuss the various methods of Transfer Pricing
- explain the different benefits and drawbacks of Transfer Pricing

7.2 INTRODUCTION

In Managerial Accounting, different division of a multi-entity company are responsible for their own profit and returns on invested capital. Hence, divisions are required to transact with each other, a transfer price is used to decide cost. It tends not much difference from the price in the market

because they will either be buying for more than the prevailing market price or selling below the market price and this will affect their performance. Transfer pricing, deals with the technique where parent company sells goods and services to subsidiary entities at an inflated price to deliberately reduce profit and tax liability.

The transfer pricing is the price that the “selling” division charges the “buying” division for the product. Because object that float usually flow downstream hence, the selling division is called the **upstream division** and the buying division is called **downstream division.**

Transferred product can be classified into two criteria. The first criterion is whether there is readily available external market price for the product. The second criterion is whether the downstream division will sell the product as is or whether or whether the transferred product becomes an input in the downstream division’s own production process.

Transfer pricing involves the assignment of costs to transactions for goods and services between related parties. It is considered as the setting of the price for goods and services sold between or related legal entities within an enterprise. For example, if a subsidiary company sells goods to a parent company, the cost of those goods paid by the parent to the subsidiary is the transfer price.

7.3 DEFINITION OF TRANSFER PRICING

A transfer price is what one part of a company charges another part of the same company for goods or services. Transaction may include the trade of supplies or labour between departments. Transfer prices are used when individual entities of a larger multi-entity firm are treated and measured as separately run entities and is also known as ‘transfer cost’.

Transfer price is the price one segment (sub-unit, department, process, division and so on) of the firm charges for a product or service supplied to another segment of the same firm. For eg: a publication company may have a number of divisions, like paper, printing, binding etc. The paper division may supply paper rolls to external markets and to the printing division for printing of books, magazines etc.

7.4 FEATURES OF TRANSFER PRICING

The following are the features of transfer pricing:

a. Goal Congruence: It should be in the best interest of the company. All the decision made my different profit centre manager should be consistent with the objectives of the company.

b. Fairness: All the divisions must perceive that the transfer price must be fair since it will impact divisional profit and hence performance evaluation.

c. Autonomy: The autonomy of the divisional managers must be maintained by the system used to set the transfer price, as this will improve managerial motivation.

d. Book keeping: The transfer price chosen should make it simple to record the movement of goods and services between divisions.

e. Minimise global tax liability: All the companies can use transfer pricing policies to move the profits around the world and thereby minimize their global tax liability.



CHECK YOUR PROGRESS

Q 1: Define Transfer Pricing.

.....

.....

Q 2: State are the two features of transfer pricing.

.....

.....

7.5 NEED OF TRANSFER PRICING

When product is transfer between profit centres or investment centres within a decentralised firm, transfer prices are necessary to calculate divisional profit, which can affect divisional performance evaluation. The transfer price can determine whether managers incentive align with the incentives of the overall company and its owners. The transfer price

becomes an expense for the downstream division and revenue for the upstream division.

Rationale of Transfer pricing is given below:

a. It communicates data that leads to goal congruence decision.
b. It guides the manager to make the best possible decisions regarding whether to buy or sell products inside or outside the organisation.
c. It develops base for MNCs to minimize their worldwide taxes, duties and tariffs.
d. It ensures optimal decisions which lead to profit in the divisions of the same organisation.
e. It helps in evaluating segment performance and thus motivates the buying and selling managers towards goal congruence.



CHECK YOUR PROGRESS

Q 3: Mention one rationale of transfer pricing.

.....

.....

7.6 OBJECTIVES OF TRANSFER PRICING

The objectives of transfer pricing include the following:

1. It promotes internal transfers between individual profit centres.
2. It provides a mechanism whereby the profits of the company as a whole are shared out between individual profit centres. This also helps sustain high level of managerial efficiency.
3. It provides data on the basis of which optimal resource allocation decisions can be made.
4. It provides data based on which sourcing decisions can be made. In case of publication company, for example, the important question is: should the printing division get paper rolls from the paper division or buy them from external suppliers?
5. A transfer pricing system if properly established can check multinational companies and international groups which may try to

manipulate transfer prices between countries in order to minimise the overall tax burden.

6. Transfer prices should allow goal congruence to take place, which in effect means that the objectives of divisional managers are compatible with the objectives of overall company.

7.7 ADVANTAGES OF TRANSFER PRICING:

It provides market price for goal congruence and managerial effort in competitive market under profit center concept.

(i) It facilitates variable costs which is ideal when excess capacity exist for selling division.

(ii) It is based on the total cost. Selling division is not required to bear any loss. Fixed costs are also recovered.

7.8 LIMITATIONS OF TRANSFER PRICING

The points of limitations transfer pricing are given below:

1. Market prices are not always available.
2. It fails to encourage selling divisions for supply and does not reflect the efficiency of buying unit as material is obtained at less than market price.
3. It fails to measure the performance of selling division and difficult to understand the efficiency of buying unit as material is obtained at less than market price.



CHECK YOUR PROGRESS

Q 4: State two objectives of transfer pricing

.....

.....

Q 5: Mention two advantages of transfer pricing?

.....

.....

Q 6: Give a point of limitation of Transfer Pricing.

.....

.....

7.9 TRANSFER PRICING METHODS

The following are the methods of transfer pricing:

1. **Market-Based Transfer Prices:** Microeconomic theory shows that when divisional manager strives to maximize divisional profits, a market based transfer price aligns their incentives with owners' incentives of maximising overall cooperate profit. The transfer will occur when it is in the best interest of shareholder and the transfer will be refused by at least one divisional manager when shareholder would prefer for the transfer not to occur.

   Market-based transfer pricing continues to align managerial incentives with corporate goals even in the presence of these cost savings. In this case does appropriate adjustment to the transfer price, i.e., the market-based transfer price is reduced by theses cost savings.

   Advantages:

   Actual costs are fluctuating and hence, difficult to ascertain. On the other hand, market prices can be easily ascertained.

   (i) Profits resulting from market price based transfer prices are good parameters for performance evaluation of selling and buying divisions.

   (ii) It represents the basis of purchasing/selling from outside and thus; supplying division gets a fair reward.

   Limitations of Market-based Pricing:

   Buying division generally results market price. They may question buying from the selling division if in any way they have to pay the market price?

   (i) Market price is a rather vague term as such prices may be ex-factory prices, wholesale prices, retail prices etc.

(ii) Market Prices may not be available for intermediate products, as these products may not have any market.

(iii) It is difficult to operate if the intermediate product is for captive consumption.

2. **Cost-Based Transfer Price:** It can also align managerial incentives with corporate goals, if various factors are properly considered. This includes the outside market opportunities for both the divisions and possible capacity constraints of the upstream divisions. According to this method, goods and services are transferred from one segment of the company to another on the basis of unit cost of production of the transferring division. The cost could either be taken to be the actual cost of production or the standard cost of production. The advantage of this method of transfer pricing is that it is very simple and convenient to operate.
3. **Marginal Cost Pricing:** When the internal price is too high compared to the market price and purchasing department is free to acquire the goods from the market. If we use there will be a heavy loss to the company as the company's own production cannot be disposed off. But it will be in the interest of the company to utilise the goods produced internally to the maximum extent. Under such situation goods should be invoiced at marginal cost only excluding the fixed cost.
4. **Opportunity Cost Pricing:** It recognise the minimum price that the selling division is ready to accept and the maximum price that the buying division is ready to pay. The final transfer price may be based on these minimum expectations of both the division. The most ideal situation will be when the maximum price expected by the selling division is less than the maximum price accepted by the buying division.

It is also important to note that the fixation of transfer prices is a very delicate decision. Hence, when fixing the transfer price, overall interest of the organization should be taken into consideration. However, goal congruence should be given highest importance rather

than interests of the selling or buying division alone.

Advantages:

1. It is based on minimum expectation of division concerned.
2. It helps in providing a minimum base for pricing decision.

Limitations:

1. It is illusory in nature
2. It is affected by conflict of interest of parties concerned.

5. **Negotiated Transfer Prices:** This method has the advantage of emulating a free market in which divisional managers buy and sell from each other in a manner that simulates arm's length transaction. However, there is no reason to assume that the outcome of these transfer price negotiation will serve the best interests of the company or shareholders. The transfer price could depend on which divisional manager is the better poker player, rather than whether the transfer results in profit-maximizing production and sourcing decisions. The price arrived at after negotiations will be the mutually agreed price. Such a pricing method will be advantageous to both the divisions as well as the company as a whole.

Advantages:

1. It is governed by mutuality of the part concerned.
2. It helps in getting a competitive price for supplies.

Limitations:

1. A lot of time is spent by both the negotiating parties in fixation of negotiated prices.
2. Negotiating skills are required for the managers for arriving at mutually acceptable prices; otherwise, there is a possibility of conflicts between the divisions.

6. **Dual Transfer Price (two sets of prices):** This method of transfer pricing motivates both the buying and transferring divisions to demand and supply of the optimal quantity of the product. The selling division is credited with one price but the buying division is charged at a different price. The difference between these two prices is made

to the main account of the company and discarded when the centers' statement are consolidated.

Under a dual transfer pricing scheme, the selling price received by the upstream division differs from the purchase price paid by the downstream division. According to this method, the transferring division is allowed to give credit at one price, whereas, the buying division is charged at a different price. it enables better evaluation of profit centres and avoids conflict among them on account of transfer prices.

Advantages:

1. This method of pricing helps to avoid conflicts between the buying and selling divisions which occurred because there was one transferred priced and the contribution of profit received varied.
2. This method helps in better assessment of the exchange value of the transferred product and performance evaluation.

Disadvantages:

1. The profits of the various centers would vary from that of the whole company.
2. This method involves additional Book-keeping and where the company's main account is debited.
3. This method is misleading because it shows the different centers as making more profit than that of the whole company.
4. When conflict between centers are resolved by the dual method, problems that could have been due to the organizational structure overlooked by the top management.

7. **Incremental Cost:** Another method of transfer pricing in use by certain companies is the incremental cost of the transferring division. Incremental cost can be computed in two ways depending upon the circumstances. In case entire production is transferred to another division within the same company, the incremental cost will be the total of variable cost of transferring centre plus any fixed costs which are directly attributable to the centre/division.

8. **Shared Profit Relative to the Cost:**

According to this method no price is charged for the intra company transfer. Rather out of the total sales revenue of the company the aggregate cost of various division is deducted to find out the profit for the company as a whole; and then the profit is shared by the various profit centres relative to the cost basis of each centre, as below:

Share of profit of a particular profit centre

$$= \frac{\text{Profit the company x cost of Particular Profit centre}}{\text{Total Cost}}$$

9. **Standard Price:** Transfer prices can also be fixed on predetermined standard price basis. The standard price may be determined on the basis of cost of production and the prevailing market condition.

7.10 INTERNATIONAL TRANSFER PRICING

There is certain business organization engaged internationally. They have their subsidiary and divisions in foreign countries. Most of the multinational companies generally do business with the help of their subsidiaries. These subsidiaries develop their production base in those countries where they can get their goods and services produced at minimum possible costs. Thus, to facilitate their marketing effectiveness international intra-group transfer pricing of goods moved from one country to another. MNC's are giving special consideration to transfer pricing system.

Transfer price may be set for two subsidiaries of a corporate body so as to minimize the implication of tax on their overall profit. For example, if tax rate on profit in country A is lower than in Country B, the subsidiary will go down by this process, so tax on its profit will be less, whilst the profit of the latter subsidiary will be inflated and thereby it will bear a lower tax burden.

Transfer pricing has been assigned to play its role in international scenario. However regulatory system of the host country also be considered at the time of formulating transfer pricing system.

7.11 FACTORS AFFECTNG FIXATION OF TRANSFER PRICES

Factors affecting determination of transfer pricing are as follows:

a. Transfer price should help in the accurate measurement of divisional performance.

b. It should motivate the divisional managers to maximise the profitability of their divisions.

c. Autonomy and authority of a division should be ensured.

d. Transfer Price should allow "Goal Congruence" which means that the objectives of divisional managers match with those of the organisation.

Example 1. A Company is organized into two divisions. Division A produces a component which is sold to division B. Division A has no external buyer for its components. Division B assembles the component into a product to sell the same to external customers. The demand for its product is elastic to selling price. The estimate of the number of units which division B proposed to sell at different prices during the next year s as under:

No of units of sales	Selling price per unit (Rs)
1,000	250
2,000	200
3,000	180
4,000	150
6,000	120
8,000	100

Division A has quoted a price of Rs 80 per unit of the component on the basis of the following cost sheet

	(Figures in Rs)
Direct Material	10
Direct Labour	20
Factory Overheads	30
Factory Cost	60

Profit 20

Transfer Price 80

The factory overhead costs are fixed. Division B incurs a variable cost of Rs

On assembly of the product into finished item.

Required:

a. Prepare a statement for each division and the company as a whole to show the profitability at each level of output.

b. Determine the profit of the company as a whole at the output level at which

Division A's profit is maximum; Division B's profit is maximum.

c. What transfer price will ensure overall optimality of the company as a whole? Show your calculations.

(TP- Transfer Price)

Solution:

Statement Showing Profitability of Division A

Output	Sales@Rs 80 T.P	Variable Cost@Rs 30	Contribution
Units	Rs	Rs	Rs
1,000	80,000	30,000	50,000
2,000	1,60,000	60,000	1,00,000
3,000	2,40,000	90,000	1,50,000
4,000	3,20,000	1,20,000	2,00,000
6,000	4,80,000	1,80,000	3,00,000
8,000	6,40,000	2,40,000	4,00,000

Statement Showing Profitability Of Division B

Output	Selling Price	Total Sales	DivisionB VariableCost@ Rs 20	Transfer Value From Deptt A @ Rs 80	Total Variable Cost of Division B	Contribution
Units	Rs	Rs	Rs	Rs	Rs	
1,000	250	2,50,000	20,000	80,000	1,00,000	1,50,000
2,000	200	4,00,000	40,000	1,60,000	2,00,000	2,00,000
3,000	180	5,40,000	60,000	2,40,000	3,00,000	2,40,000
4,000	150	6,00,000	80,000	3,20,000	4,00,000	2,00,000
6,000	120	7,20,000	1,20,000	4,80,000	6,00,000	1,20,000
8,000	100	8,00,000	1,60,000	6,40,000	8,00,000	Nil

Statement showing profitability of the company as a whole

Output	Selling Price	Total Sales	DivisionA VariableCost@ Rs 30	Transfer Value From Deptt B @ Rs 20	Total Variable Cost	Contribution
Units	Rs	Rs	Rs	Rs	Rs	
1,000	250	2,50,000	30,000	20,000	50,000	2,00,000
2,000	200	4,00,000	60,000	40,000	1,00,000	3,00,000
3,000	180	5,40,000	90,000	60,000	1,50,000	3,90,000
4,000	150	6,00,000	1,20,000	80,000	2,00,000	4,00,000
6,000	120	7,20,000	1,80,000	1,20,000	3,00,000	4,20,000
8,000	100	8,00,000	2,40,000	1,60,000	4,00,000	4,00,000

a. From the tables given above, it can be concluded that division A's Profit is maximum at 8,000 units at which level company's profit as a whole is Rs 4,00,000.

b. Division B's Profit is maximum at 3,000 units at which level company's profit as a whole is Rs 3,90,000

c. Transfer price at variable cost will ensure overall optimality of the company as a whole. When transfer price for transfer of component

from division A to division B is at Rs 30 (i.e. variable cost), optimum profit of the company will be Rs 4,20,000 at output of 6,000 as is visible from table (iii)



7.12 LETS US SUM UP

After going through the unit we have come through the following:

- The various features of Transfer Pricing
- The scope of Transfer Pricing
- The factors affecting fixation of transfer pricing
- The advantages and the disadvantages of Transfer Pricing
- The methods of Transfer Pricing.



7.13 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q. No.1:

A transfer price is what one part of a company charges another part of the same company for goods or services.

Answer to Q.No.2:

1. Goal Congruence
2. Fairness.

Answer to Q.No.3:

a. It guides the manager to make the best possible decisions regarding whether to buy or sell products inside or outside the organisation.

Answer to Q.No.4:

1. It promotes internal transfers between individual profit centres.
2. It provides data on the basis of which optimal resource allocation decisions can be made.

Answer to Q.No.5:

(i) It facilitates variable costs which is ideal when excess capacity exist for selling division.

(ii) It is based on the total cost. Selling division is not required to bear any loss. Fixed costs are also recovered.

Answer to Q.No.6:

1. Market prices are not always available.



7.14 FURTHER READING

1. Stategic Management Accounting (Theory and Practice) - By V.K.Kumar
2. Cost and Management Accounting- By Shashi K. Gupta and Sharma.
3. Cost and Management Accounting – By M.C.Shukla.
4. Cost Accounting (Principles and Practice) –By M.N.Arora
5. Management Accounting- By Paresh Shah

7.1 MODEL QUESTIONS

1. What is a transfer price? Evaluate the importance of transfer pricing system.
2. Examine the advantages and the disadvantages of transfer pricing.
3. Discuss the nature of transfer pricing. Explain its rationale.
4. Explain the various methods of fixation of transfer prices.
5. What are the features of transfer pricing?

*** ***** ***