Corporate Finance

Contents

Chapter 1 Introduction to Financial Management

INTRODUCTION

Business concern needs finance to meet their requirements in the economic world. Any kind of business activity depends on the finance. Hence, it is called as lifeblood of business organization. Whether the business concerns are big or small, they need finance to fulfil their business activities.

In the modern world, all the activities are concerned with the economic activities and very particular to earning profit through any venture or activities. The entire business activities are directly related with making profit. (According to the economics concept of factors of production, rent given to landlord, wage given to labour, interest given to capital and profit given to shareholders or proprietors), a business concern needs finance to meet all the requirements. Hence finance may be called as capital, investment, fund etc. each term is having different meanings and unique characters. Increasing the profit is the main aim of any kind of economic activity.

MEANING OF FINANCE

Finance may be defined as art and science of managing money. It includes financial service and financial instruments. Finance also is referred as the provision of money at the time when it is needed. Finance function is the procurement of funds and their effective utilization in business concerns.

The concept of finance includes capital, funds, money, and amount. But each word is having unique meaning. Studying and understanding the concept of finance become an important part of the business concern.

DEFINITION OF FINANCE

According to **Khan and Jain,** "Finance is the art and science of managing money".

According to **Oxford dictionary**, the word 'finance' connotes 'management of money'.

Webster's Ninth New Collegiate Dictionary defines finance as "the Science on study of the management of funds' and the management of fund as the system that includes the circulation of money, the granting of credit, the making of investments, and the provisionof banking facilities.

DEFINITION OF BUSINESS FINANCE

According to the **Wheeler,** "Business finance is that business activity which concerns with the acquisition and conversation of capital funds in meeting financial needs and overall objectives of a business enterprise".

According to the **Guthumann and Dougall**, "Business finance can broadly be defined as the activity concerned of the funds withused in the business".

planning, raising, controlling, administering

In the words of **Parhter and Wert**, "Business finance deals primarily with raising, administering and disbursing funds ely owned business units operating in non-financial fields of industry".

is concerned w ith budgeting, financial forecasting, cash management, credit administration, investment analysis and fund procurement

Corporate finance business concern and the business concern needs to adopt modern technology and application suitable to the global environment.

According to the **Encyclopedia of Social Sciences**, "Corporation finance deals with the financial problems of corporate enterprises. These problems include the financial aspects of the promotion of new enterprises and their administration during early development, the accounting problems connected with the distinction between capital and income, the administrative questions created by growth and expansion, and finally, the financial adjustments required for the bolstering up or rehabilitation of a corporation which has come into financial difficulties".

TYPES OF FINANCE

Finance is one of the important and integral part of business concerns, hence, it plays a major role in every part of the business activities. It is used in all the area of the activities under the different names.

Finance can be classified into two major parts:

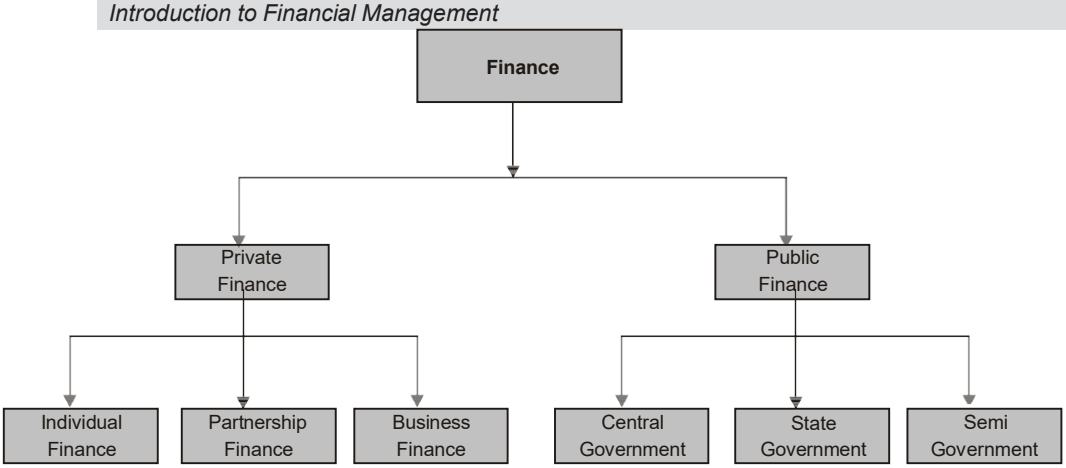


***Fig. 1.1** Types of Finance*

Private Finance, which includes the Individual, Firms, Business or Corporate activities to meet the Financial requirements.

Public Finance which concerns with revenue and disbursement of Government such matters.

as Central Government, State Government and Semi-Government Financial

DEFINITION OF FINANCIAL MANAGEMENT

Financial management is an integral part of overall management. It is concerned with the duties of the financial managers in the business firm.

The term financial management has been defined by **Solomon**, "It is concerned with the efficient use of an important economic resource namely, capital funds".

The most popular and acceptable definition of financial management as given by **S.C. Kuchal** is that "Financial Management deals with procurement of funds and their effective utilization in the business".

Howard and Upton : Financial management "as an application of general managerial principles to the area of financial decision-making.

Weston and Brigham : Financial management "is an area of financial decision-making, harmonizing individual motives and enterprise goals".

Joshep and Massie : Financial management "is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations.

Thus, Financial Management is mainly concerned with the effective funds management in the business. In simple words, Financial Management as practiced by business firms can be called as Corporation Finance or Business Finance.

SCOPE OF FINANCIAL MANAGEMENT

Financial management is one of the important parts of overall management, which is directly related with various functional departments like personnel, marketing and production. Financial management covers wide area with multidimensional approaches. The following are the important scope of financial management.

1. **Financial Management and Economics**
   Economic concepts like micro and macroeconomics are directly applied with the financial management approaches. Investment decisions, micro and macro environmental factors are closely associated with the functions of financial manager. Financial management also uses the economic equations like money value discount factor, economic order quantity etc. Financial economics is one of the emerging area, which provides immense opportunities to finance, and economical areas.
2. **Financial Management and Accounting**
   Accounting records includes the financial information of the business concern. Hence, we can easily understand the relationship between the financial management and accounting. In the olden periods, both financial management and accounting are treated as a same discipline and then it has been merged as Management Accounting because this part is very much helpful to finance manager to take decisions. But nowaday's financial management and accounting discipline are separate and interrelated.
3. **Financial Management or Mathematics**
   Modern approaches of the financial management applied large number of mathematical and statistical tools and techniques. They are also called as econometrics. Economic order quantity, discount factor, time value of money, present value of money, cost of capital, capital structure theories, dividend theories, ratio analysis and working capital analysis are used as mathematical and statistical tools and techniques in the field of financial management.
4. **Financial Management and Production Management**
   Production management is the operational part of the business concern, which helps to multiple the money into profit. Profit of the concern depends upon the production performance. Production performance needs finance, because production department requires raw material, machinery, wages, operating expenses etc. These expenditures are decided and estimated by the financial department and the finance manager allocates the appropriate finance to production department. The financial manager must be aware of the operational process and finance required for each process of production activities.
5. **Financial Management and Marketing**
   Produced goods are sold in the market with innovative and modern approaches. For this, the marketing department needs finance to meet their requirements.

The financial manager of finance department is responsible to allocate the adequate finance to the marketing department. Hence, marketing and financial management are interrelated and depends on each other.

6. **Financial Management and Human Resource**
   Financial management is also related with human resource department, which provides manpower to all the functional areas of the management. Financial manager should carefully evaluate the requirement of manpower to each department and allocate the finance to the human resource department as wages, salary, remuneration, commission, bonus, pension and other monetary benefits to the human resource department. Hence, financial management is directly related with human resource management.

OBJECTIVES OF FINANCIAL MANAGEMENT

Effective procurement and efficient use of finance lead to proper utilization of the finance by the business concern. It is the essential part of the financial manager. Hence, the financial manager must determine the basic objectives of the financial management. Objectives of Financial Management may be broadly divided into two parts such as:

1. Profit maximization
2. Wealth maximization.

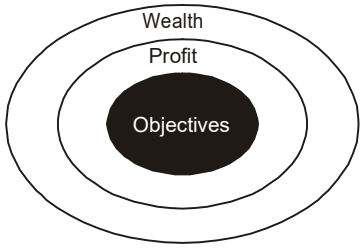


***Fig. 1.2** Objectives of Financial Management*

Profit Maximization

Main aim of any kind of economic activity is earning profit. A business concern is also functioning mainly for the purpose of earning profit. Profit is the measuring techniques to understand the business efficiency of the concern. Profit maximization is also the traditional and narrow approach, which aims at, maximizes the profit of the concern. Profit maximization consists of the following important features.

1. Profit maximization is also called as cashing per share maximization. It leads to maximize the business operation for profit maximization.
2. Ultimate aim of the business concern is earning profit, hence, it considers all the possible ways to increase the profitability of the concern.

3. Profit is the parameter of measuring the efficiency of the business concern. It shows the entire position of the business concern.
4. Profit maximization objectives help to reduce the risk of the business.

Favourable Arguments for Profit Maximization

The following important points are in support of the profit maximization objectives of thebusiness concern:

(i) Main aim is earning profit.
(ii) Profit is the parameter of the business operation.
(iii) Profit reduces risk of the business concern.
(iv) Profit is the main source of finance.
(v) Profitability meets the social needs also.

Unfavourable Arguments for Profit Maximization

The following important points are against the objectives of profit maximization:

(i) Profit maximization leads to exploiting workers and consumers.
(ii) Profit maximization creates immoral practices such as corrupt practice, unfairtrade practice, etc.
(iii) Profit maximization objectives leads to inequalities among the sake holders suchas customers, suppliers, public shareholders, etc.

Drawbacks of Profit Maximization

Profit maximization objective consists of certain drawback also:

(i) **It is vague :** In this objective, profit is not defined precisely or correctly. It creates some unnecessary opinion regarding earning habits of the business concern.
(ii) **It ignores the time value of money:** Profit maximization does not consider the time value of money or the net present value of the cash inflow. It leads certain differences between the actual cash inflow and net present cash flow during a particular period.
(iii) **It ignores risk:** Profit maximization does not consider risk of the business concern. Risks may be internal or external which will affect the overall operationof the business concern.

Wealth Maximization

Wealth maximization is one of the modern approaches, which involves latest innovations and improvements in the field of the business concern. The term wealth means shareholder wealth or the wealth of the persons those who are involved in the business concern.

Wealth maximization is also known as value maximization or net present worth maximization. This objective is an universally accepted concept in the field of business.

Favourable Arguments for Wealth Maximization

(i) Wealth maximization is superior to the profit maximization because the main aim of the business concern under this concept is to improve the value or wealth of the shareholders.

(ii) Wealth maximization considers the comparison of the value to cost associated with the business concern. Total value detected from the total cost incurred for the business operation. It provides extract value of the business concern.

(iii) Wealth maximization considers both time and risk of the business concern.

(iv) Wealth maximization provides efficient allocation of resources.

(v) It ensures the economic interest of the society.

Unfavourable Arguments for Wealth Maximization

(i) Wealth maximization leads to prescriptive idea of the business concern but it maynot be suitable to present day business activities.

(ii) Wealth maximization is nothing, it is also profit maximization, it is the indirectname of the profit maximization.

(iii) Wealth maximization creates ownership-management controversy.

(iv) Management alone enjoy certain benefits.

(v) The ultimate aim of the wealth maximization objectives is to maximize the profit.

(vi) Wealth maximization can be activated only with the help of the profitable positionof the business concern.

APPROACHES TO FINANCIAL MANAGEMENT

Financial management approach measures the scope of the financial management in various fields, which include the essential part of the finance. Financial management is not a revolutionary concept but an evolutionary. The definition and scope of financial management has been changed from one period to another period and applied various innovations. Theoretical points of view, financial management approach may be broadly divided into two major parts.

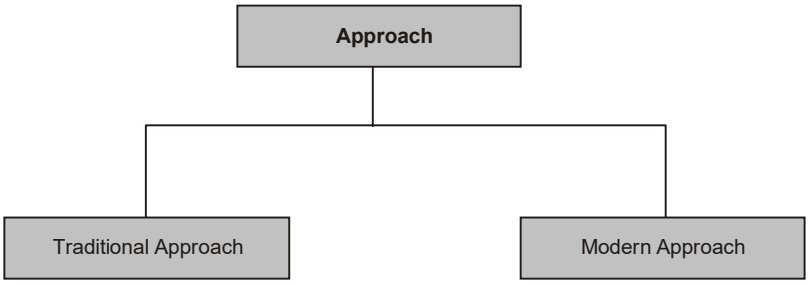


Fig. 1.3 *Approaches to Finance Management*

Traditional Approach

Traditional approach is the initial stage of financial management, which was followed, in the early part of during the year 1920 to 1950. This approach is based on the past experience and the traditionally accepted methods. Main part of the traditional approach is rising of funds for the business concern. Traditional approach consists of the following important area.

Arrangement of funds from lending body.

Arrangement of funds through various financial instruments. Finding out the various sources of funds.

FUNCTIONS OF FINANCE MANAGER

Finance function is one of the major parts of business organization, which involves the permanent, and continuous process of the business concern. Finance is one of the interrelated functions which deal with personal function, marketing function, production function and research and development activities of the business concern. At present, every business concern concentrates more on the field of finance because, it is a very emerging part which reflects the entire operational and profit ability position of the concern. Deciding the proper financial function is the essential and ultimate goal of the business organization.

Finance manager is one of the important role players in the field of finance function. He must have entire knowledge in the area of accounting, finance, economics and management. His position is highly critical and analytical to solve various problems related to finance. A person who deals finance related activities may be called finance manager.

Finance manager performs the following major functions:

1. **Forecasting Financial Requirements**
   It is the primary function of the Finance Manager. He is responsible to estimate the financial requirement of the business concern. He should estimate, how much finances required to acquire fixed assets and forecast the amount needed to meet the working capital requirements in future.
2. **Acquiring Necessary Capital**
   After deciding the financial requirement, the finance manager should concentrate how the finance is mobilized and where it will be available. It is also highly critical in nature.
3. **Investment Decision**
   The finance manager must carefully select best investment alternatives and consider the reasonable and stable return from the investment. He must be well versed in the field of capital budgeting techniques to determine the effective utilization of investment. The finance manager must concentrate to principles of safety, liquidity and profitability while investing capital.

4. **Cash Management**
   Present days cash management plays a major role in the area of finance because proper cash management is not only essential for effective utilization of cash but it also helps to meet the short-term liquidity position of the concern.
5. **Interrelation with Other Departments**
   Finance manager deals with various functional departments such as marketing, production, personel, system, research, development, etc. Finance manager should have sound knowledge not only in finance related area but also well versed in other areas. He must maintain a good relationship with all the functionaldepartments of the business organization.

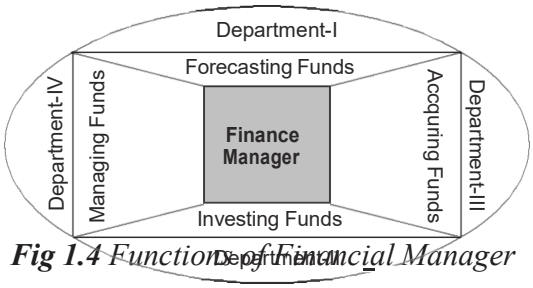


***Fig 1.4** Functions of Financial Manager*

IMPORTANCE OF FINANCIAL MANAGEMENT

Finance is the lifeblood of business organization. It needs to meet the requirement of the business concern. Each and every business concern must maintain adequate amount of finance for their smooth running of the business concern and also maintain the business carefully to achieve the goal of the business concern. The business goal can be achieved only with the help of effective management of finance. We can't neglect the importance of finance at any time at and at any situation. Some of the importance of the financial management is as follows:

Financial Planning

Financial management helps to determine the financial requirement of the business concernand leads to take financial planning of the concern. Financial planning is an important part of the business concern, which helps to promotion of an enterprise.

Acquisition of Funds

Financial management involves the acquisition of required finance to the business concern. Acquiring needed funds play a major part of the financial management, which involve possible source of finance at minimum cost.

Proper Use of Funds

Proper use and allocation of funds leads to improve the operational efficiency of the business concern. When the finance manager uses the funds properly, they can reduce the cost of capital and increase the value of the firm.

Financial Decision

Financial management helps to take sound financial decision in the business concern. Financial decision will affect the entire business operation of the concern. Because there is a direct relationship with various department functions such as marketing, production personnel, etc.

Improve Profitability

Profitability of the concern purely depends on the effectiveness and proper utilization of funds by the business concern. Financial management helps to improve the profitability position of the concern with the help of strong financial control devices such as budgetary control, ratio analysis and cost volume profit analysis.

Increase the Value of the Firm

Financial management is very important in the field of increasing the wealth of the investors and the business concern. Ultimate aim of any business concern will achieve the maximum profit and higher profitability leads to maximize the wealth of the investors as well as the nation.

Promoting Savings

Savings are possible only when the business concern earns higher profitability and maximizing wealth. Effective financial management helps to promoting and mobilizing individual and corporate savings.

Nowadays financial management is also popularly known as business finance or corporate finances. The business concern or corporate sectors cannot function without the importance of the financial management.

MODEL QUESTIONS

1. What is finance? Define business finance.
2. Explain the types of finance.
3. Discuss the objectives of financial management.
4. Critically evaluate various approaches to the financial management.
5. Explain the scope of financial management.
6. Discuss the role of financial manager.
7. Explain the importance of financial management.

Chapter 2 Financial Statement Analysis

INTRODUCTION

A financial statement is an official document of the firm, which explores the entire financial information of the firm. The main aim of the financial statement is to provide information and understand the financial aspects of the firm. Hence, preparation of the financial statement is important as much as the financial decisions.

MEANING AND DEFINITION

According to Hamptors John, the financial statement is an organized collection of data according to logical and consistent accounting procedures. Its purpose is to convey an understanding of financial aspects of a business firm. It may show a position at a moment of time as in the case of a balance-sheet or may reveal a service of activities over a given period of time, as in the case of an income statement.

Financial statements are the summary of the accounting process, which, provides useful information to both internal and external parties. **John N. Nyer** also defines it "Financial statements provide a summary of the accounting of a business enterprise, the balance-sheet reflecting the assets, liabilities and capital as on a certain data and the incomestatement showing the results of operations during a certain period".

Financial statements generally consist of two important statements:

(i) The income statement or profit and loss account.
(ii) Balance sheet or the position statement.

A part from that, the business concern also prepares some of the other parts ofstatements, which are very useful to the internal purpose such as:

(i) Statement of changes in owner's equity.
(ii) Statement of changes in financial position.

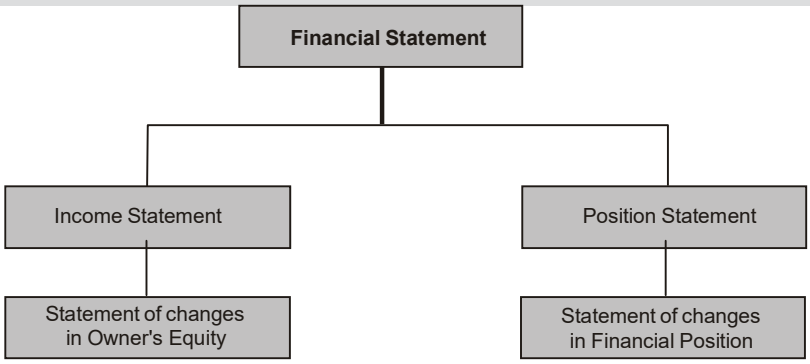


***Fig. 2.1** Financial Statement*

Income Statement

Income statement is also called as profit and loss account, which reflects the operational position of the firm during a particular period. Normally it consists of one accounting year. It determines the entire operational performance of the concern like total revenue generated and expenses incurred for earning that revenue.

Income statement helps to ascertain the gross profit and net profit of the concern. Gross profit is determined by preparation of trading or manufacturing a/c and net profit is determined by preparation of profit and loss account.

Position Statement

Position statement is also called as balance sheet, which reflects the financial position of the firm at the end of the financial year.

Position statement helps to ascertain and understand the total assets, liabilities and capital of the firm. One can understand the strength and weakness of the concern with the help of the position statement.

Statement of Changes in Owner's Equity

It is also called as statement of retained earnings. This statement provides information about the changes or position of owner's equity in the company. How the retained earnings are employed in the business concern. Nowadays, preparation of this statement is not popular and nobody is going to prepare the separate statement of changes in owner's equity.

Statement of Changes in Financial Position

Income statement and position statement shows only about the position of the finance, hence it can't measure the actual position of the financial statement. Statement of changes in financial position helps to understand the changes in financial position from one periodto another period.

Statement of changes in financial position involves two important areas such as fund flow statement which involves the changes in working capital position and cash flow statement which involves the changes in cash position.

TYPES OF FINANCIAL STATEMENT ANALYSIS

Analysis of Financial Statement is also necessary to understand the financial positions during a particular period. According to Myres, "Financial statement analysis is largely a study of the relationship among the various financial factors in a business as disclosed by a single set of statements and a study of the trend of these factors as shown in a series of statements".

Analysis of financial statement may be broadly classified into two important types on the basis of material used and methods of operations.

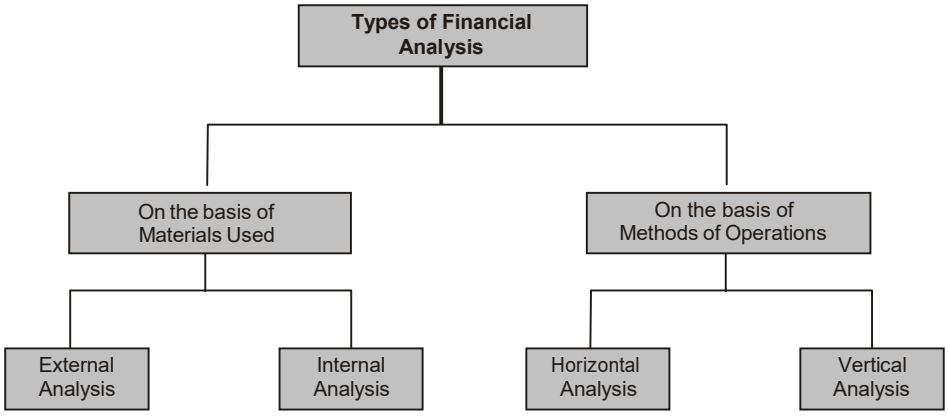


Fig. 2.2 *Types of Financial Statement Analysis*

1. **Based on Material Used**

   Based on the material used, financial statement analysis may be classified into two major types such as External analysis and internal analysis.

   A. External Analysis

   Outsiders of the business concern do normally external analyses but they are indirectly involved in the business concern such as investors, creditors, government organizations and other credit agencies. External analysis is very much useful to understand the financial and operational position of the business concern. External analysis mainly depends on the published financial statement of the concern. This analysis provides only limited information about the business concern.

   B. Internal Analysis

   The company itself does disclose some of the valuable informations to the business concern in this type of analysis. This analysis is used to understand

the operational performances of each and every department and unit of the business concern. Internal analysis helps to take decisions regarding achievingthe goals of the business concern.

2. **Based on Method of Operation**

Based on the methods of operation, financial statement analysis may be classified into two major types such as horizontal analysis and vertical analysis.

A. Horizontal Analysis

Under the horizontal analysis, financial statements are compared with several years and based on that, a firm may take decisions. Normally, the current year's figures are compared with the base year (base year is consider as 100) and how the financial information are changed from one year to another. This analysis is also called as dynamic analysis.

B. Vertical Analysis

Under the vertical analysis, financial statements measure the quantities relationship of the various items in the financial statement on a particular period. It is also called as static analysis, because, this analysis helps to determine the relationship with various items appeared in the financial statement. For example, a sale is assumed as 100 and other items are converted into salesfigures.

TECHNIQUES OF FINANCIAL STATEMENT ANALYSIS

Financial statement analysis is interpreted mainly to determine the financial and operational performance of the business concern. A number of methods or techniques are used to analyse the financial statement of the business concern. The following are the common methods or techniques, which are widely used by the business concern.

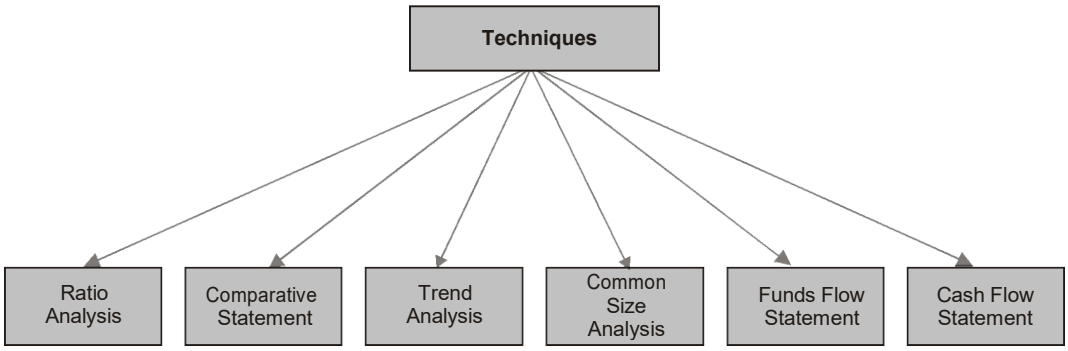


***Fig. 2.3** Techniques of Financial Statement Analysis*

1. Comparative Statement Analysis
   - A. Comparative Income Statement Analysis
   - B. Comparative Position Statement Analysis

2. Trend Analysis
3. Common Size Analysis
4. Fund Flow Statement
5. Cash Flow Statement
6. Ratio Analysis

Comparative Statement Analysis

Comparative statement analysis is an analysis of financial statement at different period of time. This statement helps to understand the comparative position of financial and operational performance at different period of time.

Comparative financial statements again classified into two major parts such as comparative balance sheet analysis and comparative profit and loss account analysis.

Comparative Balance Sheet Analysis

Comparative balance sheet analysis concentrates only the balance sheet of the concern at different period of time. Under this analysis the balance sheets are compared with previous year's figures or one-year balance sheet figures are compared with other years. Comparative balance sheet analysis may be horizontal or vertical basis. This type of analysis helps to understand the real financial position of the concern as well as how the assets, liabilities and capitals are placed during a particular period.

Exercise 1

The following are the balance sheets of Tamil Nadu Mercantile Bank Ltd., for the years 2003 and 2004 as on 31st March. Prepare a comparative balance sheet and discuss the operational performance of the business concern.

Balance Sheet of Tamil Nadu Mercantile Bank Limited

As on 31st March **(Rs. in thousands)**

Liabilities	2003 Rs.	2004 Rs.	Assets	2003 Rs.	2004 Rs.
Capital	2,845	2,845	Cash and Balance with RBI	27,06,808	22,37,601
Reserve and Surplus	39,66,009	47,65,406			
Deposits	4,08,45,783	4,40,42,730	Balance with Banks and	11,36,781	16,07,975
Borrowings			Money at call & and short notice	2,14,21,060	2,35,37,098
Other Liabilities	7,27,671	2,84,690	Investments	1,95,99,764	2,11,29,869
Provisions	16,74,165	17,99,197	Advances	4,93,996	5,36,442
			Fixed Assets	18,58,064	18,35,883
			Other Assets		
	4,72,16,473	5,08,94,868		4,72,16,473	5,08,94,868

Comparative Balance Sheet Analysis

Particulars	Year ending 31st March		Increased/ Decreased (Amount)	Increased / Decreased (Percentage)
	2003 Rs.	2004 Rs.	Rs.	Rs.
Assets				
Current Assets				
Cash and Balance with RBI	27,06,808	22,37,601	(+) 4,69,207	(+) 17.33
Balance with Banks and money at call and short notice	11,36,781	16,07,975	(–) 4,71,194	(–) 41.45
Total Current Assets	**38,43,589**	**38,45,576**	**1987**	**0.052**
Fixed Assets				
Investments	2,14,21,060	2,35,37,098	(-) 21,16,038	(-) 9.88
Advances	1,95,99,764	2,11,39,869	(-) 15,40,105	(-) 7.86
Fixed Assets	4,93,996	5,36,442	(-) 42,446	(-) 8.59
Other Assets	18,58,064	18,35,883	(+) 22,181	(+) 1.19
Total Fixed Assets	**4,33,72,884**	**4,70,49,292**	**(+) 36,76,408**	**8.48**
Total Assets	**4,72,16,473**	**5,08,94,868**	**36,78,395**	**7.79**
Current Liabilities				
Borrowings	7,27,671	2,84,690	(+) 4,42,981	60.88
Other Liability and Provisions	16,74,165	17,99,197	(–) 1,25,032	7.47
Total Current Liability	**24,01,836**	**20,83,887**	**3,17,949**	**13.24**
Fixed Liability Capital	2,845	2,845	—	—
Reserves surplus	39,66,009	47,65,406	(+) 7,99,397	20.16
Deposit	4,08,45,783	4,40,42,730	(+) 31,96,947	7.83
Total Fixed Liability	**4,48,14,637**	**4,88,10,981**	**(+) 39,96,344**	**8.92**
Total Liability	**4,72,16,473**	**5,08,94,868**	**36,78,395**	**7.79**

Comparative Profit and Loss Account Analysis

Another comparative financial statement analysis is comparative profit and loss account analysis. Under this analysis, only profit and loss account is taken to compare with previous year's figure or compare within the statement. This analysis helps to understand the operational performance of the business concern in a given period. It may be analyzed on horizontal basis or vertical basis.

Trend Analysis

The financial statements may be analysed by computing trends of series of information. It may be upward or downward directions which involve the percentage relationship of each and every item of the statement with the common value of 100%. Trend analysis helps to understand the trend relationship with various items, which appear in the financial statements. These percentages may also be taken as index number showing relative changes in the financial information resulting with the various period of time. In this analysis, only major items are considered for calculating the trend percentage.

Exercise 2

Calculate the Trend Analysis from the following information of Tamilnadu Mercantile Bank Ltd., taking 1999 as a base year and interpret them (in thousands).

Year	Deposits	Advances	Profit
1999	2,05,59,498	97,14,728	3,50,311
2000	2,66,45,251	1,25,50,440	4,06,287
2001	3,19,80,696	1,58,83,495	5,04,020
2002	3,72,99,877	1,77,26,607	5,53,525
2003	4,08,45,783	1,95,99,764	6,37,634
2004	4,40,42,730	2,11,39,869	8,06,755

Solution

Trend Analysis (Base year 1999=100)

(Rs. in thousands)

Year	Deposits		Advances		Profits	
	Amount Rs.	Trend Percentage	Amount Rs.	Trend Percentage	Amount Rs.	Trend Percentage
1999	2,05,59,498	100.0	97,14,728	100.0	3,50,311	100.0
2000	2,66,45,251	129.6	1,25,50,440	129.2	4,06,287	115.9
2001	3,19,80,696	155.5	1,58,83,495	163.5	5,04,020	143.9
2002	3,72,99,877	181.4	1,77,26,607	182.5	5,53,525	150.0
2003	4,08,45,783	198.7	1,95,99,764	201.8	6,37,634	182.0
2004	4,40,42,730	214.2	2,11,39,869	217.6	8,06,755	230.3

Common Size Analysis

Another important financial statement analysis techniques are common size analysis in which figures

reported are converted into percentage to some common base. In the balance sheet the total assets figures is assumed to be 100 and all figures are expressed as a percentage of this total. It is one of the simplest methods of financial statement analysis, which reflects the relationship of each and every item with the base value of 100%.

Exercise 3

Common size balance sheet of Tamilnadu Mercantile Bank Ltd., as on 31st March 2003 and 2004.

Particulars	31st March 2003 Amount	Percentage	31st March 2004 Amount	Percentage
Fixed Assets				
Investments	2,14,21,060	45.37	2,35,37,098	46.25
Advances	1,95,99,764	41.51	2,11,39,869	41.54
Fixed Assets	4,93,996	1.05	5,36,442	1.05
Other Assets	18,58,064	3.94	18,35,883	3.61
Total Fixed Assets	**4,33,72,884**	**91.86**	**4,70,49,292**	**94.44**
Current Assets				
Cash and Balance with RBI	27,06,808	5.73	22,37,601	4.40
Balance with banks and money at call and short notice	11,36,781	2.41	16,07,975	3.20
Total Current Assets	**38,43,589**	**8.14**	**38,45,576**	**7.60**
Total Assets	**4,72,16,473**	**100.00**	**5,08,94,868**	**100.00**
Fixed Liabilities				
Capital	2,845	0.01	2,845	0.01
Reserve and Surplus	39,66,009	8.40	47,65,406	9.36
Deposits	4,08,45,783	86.50	4,40,42,730	86.54
Total Fixed Liabilities	**4,48,14,637**	**94.91**	**4,88,10,981**	**95.91**
Current Liability				
Borrowings	7,27,671	1.54	2,84,690	0.56
Other Liabilities Provisions	16,74,165	3.55	17,99,197	3.53
Total Current Liability	**24,01,836**	**5.09**	**20,83,887**	**4.09**
Total Liabilities	**4,72,16,473**	**100.00**	**5,08,94,868**	**100.00**

FUNDS FLOW STATEMENT

Funds flow statement is one of the important tools, which is used in many ways. It helps to understand the changes in the financial position of a business enterprise between the beginning and ending financial statement dates. It is also called as statement of sources and uses of funds.

Institute of Cost and Works Accounts of India, funds flow statement is defined as "a statement prospective or retrospective, setting out the sources and application of the funds of an enterprise. The purpose of the statement is to indicate clearly the requirement of funds and how they are proposed to be raised and the efficient utilization and application of the same".

CASH FLOW STATEMENT

Cash flow statement is a statement which shows the sources of cash inflow and uses of cash out-flow of the business concern during a particular period of time. It is the statement, which involves only short-term financial position of the business concern. Cash flow statement provides a summary of operating, investment and financing cash flows and reconciles them with changes in its cash and cash equivalents such as

marketable securities. Institute of Chartered Accountants of India issued the Accounting Standard (AS-3) related to the preparation of cash flow statement in 1998.

Difference Between Funds Flow and Cash Flow Statement

Funds Flow Statement	Cash Flow Statement
1. Funds flow statement is the report on themovement of funds or working capital 2. Funds flow statement explains how working capital is raised and used during the particular 3. The main objective of fund flow statement isto show the how the resources have been balanced mobilized and used. 4. Funds flow statement indicates the results ofcurrent financial management. 5. In a funds flow statement increase or decreasein working capital is recorded. 6. In funds flow statement there is no openingand closing balances.	1. Cash flow statement is the report showingsources and uses of cash. 2. Cash flow statement explains the inflow and out flow of cash during the particular period. 3. The main objective of the cash flow statementis to show the causes of changes in cash between two balance sheet dates. 4. Cash flow statement indicates the factors contributing to the reduction of cash balancein spite of increase in profit and vice-versa. 5. In a cash flow statement only cash receipt andpayments are recorded. 6. Cash flow statement starts with opening cash balance and ends with closing cash balance.

Exercise 4

From the following balance sheet of A Company Ltd. you are required to prepare a schedule of changes in working capital and statement of flow of funds.

Balance Sheet of A Company Ltd., as on 31st March

Liabilities	2004	2005	Assets	2004	2005
Share Capital	1,00,000	1,10,000	Land and Building	60,000	60,000
Profit and Loss a/c	20,000	23,000	Plant and Machinery	35,000	45,000
Loans	—	10,000	Stock	20,000	25,000
Creditors	15,000	18,000	Debtors	18,000	28,000
Bills payable	5,000	4,000	Bills receivable	2,000	1,000
			Cash	5,000	6,000
	1,40,000	1,65,000		1,40,000	1,65,000

Solution

Schedule of Changes in Working Capital

Particulars	2004 Rs.	2005 Rs.	Increase Rs.	Decrease Rs.
Current Assets				
Stock	20,000	25,000	5,000	—
Debtors	18,000	28,000	10,000	—
Bills Receivable	2,000	1,000	—	1,000
Cash	5,000	6,000	1,000	
A	**45,000**	**60,000**		
Less Current Liabilities				
Creditors	15,000	18,000		3,000
Bills Payable	5,000	4,000	1,000	
B	**20,000**	**22,000**	17,000	4,000
A-B	25,000	38,000	—	13,000
Increase in W.C.	**38,000**	**38,000**	**17,000**	**17,000**

Fund Flow Statement

Sources	Rs.	Application	Rs.
Issued Share Capital	10,000	Purchase of Plant and Machinery	10,000
Loan	10,000	Increase in Working Capital	13,000
Funds From Operations	3,000		
	23,000		**23,000**

Exercise 5

From the above example 4 prepare a Cash Flow Statement.

Solution

Cash Flow Statement

Inflow	Rs.	Outflow	Rs.
Balance b/d	5,000	Purchase of plant	10,000
Issued Share Capital	10,000	Increase Current Assets	
Loan	10,000	Stock	
Cash Opening Profit	3,000	Decrease in Bills Payable	5,000
Decrease in Bills	1,000	Balance c/d	10,000
Receivable	3,000		1,000
Increase in Creditors			6,000
	32,000		**32,000**

RATIO ANALYSIS

Ratio analysis is a commonly used tool of financial statement analysis. Ratio is a mathematical relationship

between one number to another number. Ratio is used as an index for evaluating the financial performance of the business concern. An accounting ratio shows the mathematical relationship between two figures, which have meaningful relation with each other. Ratio can be classified into various types. Classification from the point of view of financial management is as follows:

- Liquidity Ratio
- Activity Ratio
- Solvency Ratio
- Profitability Ratio

Liquidity Ratio

It is also called as short-term ratio. This ratio helps to understand the liquidity in a business which is the potential ability to meet current obligations. This ratio expresses the relationship between current assets and current assets of the business concern during a particular period. The following are the major liquidity ratio:

S. No.	Ratio	Formula	Significant Ratio
1.	Current Ratio	Current Assets / Current Liability	2 : 1
2.	Quick Ratio	Quick Assets / Quick / Current Liability	1 : 1

Activity Ratio

It is also called as turnover ratio. This ratio measures the efficiency of the current assets and liabilities in the business concern during a particular period. This ratio is helpful to understand the performance of the business concern. Some of the activity ratios are given below:

S. No.	Ratio	Formula
1.	Stock Turnover Ratio	$\frac{\text{Cost of Sales}}{\text{Average Inventory}}$
2.	Debtors Turnover Ratio	$\frac{\text{Credit Sales}}{\text{Average Debtors}}$
3.	Creditors Turnover Ratio	$\frac{\text{Credit Purchase}}{\text{Average Credit}}$
4.	Working Capital Turnover Ratio	$\frac{\text{Sales}}{\text{Net Working Capital}}$

Solvency Ratio

It is also called as leverage ratio, which measures the long-term obligation of the business concern. This ratio helps to understand, how the long-term funds are used in the business concern. Some of the solvency ratios are given below:

S. No	Ratio	Formula
1.	Debt-Equity Ratio	External Equity / Internal Equity
2.	Proprietary Ratio	Shareholder / Shareholder ' s Fund / Total Assets
3.	Interest Coverage Ratio	EBIT / Fixed Interest Charges

Profitability Ratio

Profitability ratio helps to measure the profitability position of the business concern. Some of the major profitability ratios are given below.

S. No	Ratio	Formula
1.	Gross Profit Ratio	Gross Profit / Net Sales × 100
2.	Net Profit Ratio	Net Profit after tax / Net Sales × 100
3.	Operating Profit Ratio	Operating Net Profit / Sales × 100
4.	Return in Investment	Net Profit after tax / Shareholder Fund × 100

Exercise 6

From the following balance sheet of Mr. Arvind Industries Ltd., as 31st March 2007.

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	10,000	Fixed assets (less depreciation Rs. 10,000)	26,000
7% Preference Share Capital	2,000	Current Assets:	
Reserves and Surplus	8,000	Cash	1,000
6% Mortgage Debentures	14,000	Investments (10%)	3,000
Current Liabilities:		Sundry debtors	4,000
Creditors	1,200	Stock	6,000
Bills payable	2,000		
Outstanding expenses	200		
Tax Provision	2,600		

	40,000		40,000

Other information:

1. Net sales Rs. 60,000
2. Cost of goods sold Rs. 51,600
3. Net income before tax Rs. 4,000
4. Net income after tax Rs. 2,000 Calculate appropriate ratios.

Solution

Short-term solvency ratios

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liability}} = \frac{14,000}{6,000} = 2.33 : 1$$

$$\text{Liquid Ratio} = \frac{\text{Liquid Ratio}}{\text{Current Liability}} = \frac{8,000}{6,000} = 1.33 : 1$$

Long-term solvency ratios

$$\text{Proprietary ratio} = \frac{\text{Proprietor's funds}}{\text{Total Assets}} = \frac{20,000}{40,000} = 0.5 : 1$$

Proprietor's fund or Shareholder's fund = Equity share capital + Preference share capital + Reserve and surplus

= 10,000 + 2,000 + 8,000 = 20,000

$$\text{Debt-Equity ratio} = \frac{\text{External equities}}{\text{Internal equities}} = \frac{20,000}{20,000} = 1:1$$

$$\text{Interest coverage ratio} = \frac{\text{EBIT}}{\text{Fixed interest charges}} = \frac{4,000+840}{840} = 5.7 \text{ times}$$

Fixed interest charges = 6% on debentures of Rs.14,000

= Rs. 840

Activity Ratio

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Sales}}{\text{Average Inventory}} = \frac{51,600}{6,000} = 8.6 \text{ times}$$

As there is no opening stock, closing stock is taken as average stock.

$$\text{Debtors Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Debtors}} = \frac{60,000}{6,000} = 10 \text{ times}$$

In the absence of credit sales and opening debtors, total sales is considered as credit sales and closing debtors as average debtors.

$$\text{Creditors turn over ratio} = \frac{\text{Credit Purchases}}{\text{Average Creditors}} = \frac{43,200}{1,200} = 36 \text{ times}$$

In absence of purchases, cost of goods sold – gross profit treated as credit purchases and in the absence of opening creditors, closing creditors are treated as average creditors.

$$\text{Working Capital Turnover Ratio} = \frac{\text{Sales}}{\text{Net Working Capital}} = \frac{60,000}{8,000} = 7.5 \text{ times}$$

Profitability Ratios

$$\text{Gross profit ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = \frac{8,400}{60,000} \times 100 = 14\%$$

$$\text{Net profit ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100 = \frac{2,000}{60,000} \times 100 = 3.33\%$$

In the absence of non-operating income, operating profit ratio is equal to net profit ratio.

$$\text{Return of Investment} = \frac{\text{Net Profit after Tax}}{\text{Shareholder's Fund}} \times 100 = \frac{2,000}{20,000} \times 100 = 10\%$$

MODEL QUESTIONS

1. What is financial statement?
2. What is financial statement analysis?
3. Discuss various types of financial statement analysis.
4. Explain various methods of financial statement analysis.
5. What are the differences between fund flow and cash flow?
6. What is ratio analysis? Explain its types.

Chapter 3 Sources of Financing

INTRODUCTION

Finance is the lifeblood of business concern, because it is interlinked with all activities performed by the business concern. In a human body, if blood circulation is not proper, body function will stop. Similarly, if the finance not being properly arranged, the business system will stop. Arrangement of the required finance to each department of business concern is highly a complex one and it needs careful decision. Quantum of finance may be depending upon the nature and situation of the business concern. But, the requirement of the finance may be broadly classified into two parts:

Long-term Financial Requirements or Fixed Capital Requirement

Financial requirement of the business differs from firm to firm and the nature of the requirements on the basis of terms or period of financial requirement, it may be long term and short-term financial requirements.

Long-term financial requirement means the finance needed to acquire land and building for business concern, purchase of plant and machinery and other fixed expenditure. Long- term financial requirement is also called as fixed capital requirements. Fixed capital is the capital, which is used to purchase the fixed assets of the firms such as land and building, furniture and fittings, plant and machinery, etc. Hence, it is also called a capital expenditure.

Short-term Financial Requirements or Working Capital Requirement

Apart from the capital expenditure of the firms, the firms should need certain expenditure like procurement of raw materials, payment of wages, day-to-day expenditures, etc. This kind of expenditure is to meet with the help of short-term financial requirements which will meet the operational expenditure of the firms. Short-term financial requirements are popularly known as working capital.

SOURCES OF FINANCE

Sources of finance mean the ways for mobilizing various terms of finance to the industrial concern. Sources of finance state that, how the companies are mobilizing finance for their requirements. The companies belong to the existing or the new which need sum amount of finance to meet the long-term and short-term requirements such as purchasing of fixed assets, construction of office building, purchase of raw materials and day-to-day expenses.

Sources of finance may be classified under various categories according to the following important heads:

1. **Based on the Period**

   Sources of Finance may be classified under various categories based on the period. **Long-term sources:** Finance may be mobilized by long-term or short-term. When the finance mobilized with large amount and the repayable over the period will be more than five years, it may be considered as long-term sources. Share capital, issue of debenture, long-term loans from financial institutions and commercial banks come under this kind of source of finance. Long-term source of finance needs to meet the capital expenditure of the firms such as purchase of fixed assets, land and buildings, etc.

   Long-term sources of finance include:

   - Equity Shares
   - Preference Shares
   - Debenture
   - Long-term Loans
   - Fixed Deposits

   Short-term sources: Apart from the long-term source of finance, firms can generate finance with the help of short-term sources like loans and advances from commercial banks, moneylenders, etc. Short-term source of finance needs to meet the operational expenditure of the business concern.

   Short-term source of finance include:

   - Bank Credit
   - Customer Advances
   - Trade Credit
   - Factoring
   - Public Deposits
   - Money Market Instruments

2. **Based on Ownership**

   Sources of Finance may be classified under various categories based on the period:

An ownership source of finance include

- Shares capital, earnings
- Retained earnings
- Surplus and Profits

Borrowed capital include

- Debenture
- Bonds
- Public deposits
- Loans from Bank and Financial Institutions.

3. **Based on Sources of Generation**

Sources of Finance may be classified into various categories based on the period.

Internal source of finance includes

- Retained earnings
- Depreciation funds
- Surplus

External sources of finance may be include

- Share capital
- Debenture
- Public deposits
- Loans from Banks and Financial institutions

4. **Based in Mode of Finance Security finance may be include**

- Shares capital
- Debenture

Retained earnings may include

- Retained earnings
- Depreciation funds

Loan finance may include

- Long-term loans from Financial Institutions
- Short-term loans from Commercial banks.

The above classifications are based on the nature and how the finance is mobilized from various sources. But the above sources of finance can be divided into three major classifications:

- Security Finance
- Internal Finance
- Loans Finance

SECURITY FINANCE

If the finance is mobilized through issue of securities such as shares and debenture, it is called as security finance. It is also called as corporate securities. This type of finance plays a major role in the field of deciding the capital structure of the company.

Characters of Security Finance

Security finance consists of the following important characters:

1. Long-term sources of finance.
2. It is also called as corporate securities.
3. Security finance includes both shares and debentures.
4. It plays a major role in deciding the capital structure of the company.
5. Repayment of finance is very limited.
6. It is a major part of the company's total capitalization.

Types of Security Finance

Security finance may be divided into two major types:

1. Ownership securities or capital stock.
2. Creditorship securities or debt capital.

Ownership Securities

The ownership securities also called as capital stock, is commonly called as shares. Shares are the most Universal method of raising finance for the business concern. Ownership capital consists of the following types of securities.

- Equity Shares
- Preference Shares
- No par stock
- Deferred Shares

EQUITY SHARES

Equity Shares also known as ordinary shares, which means, other than preference shares. Equity shareholders are the real owners of the company. They have a control over the management of the company. Equity shareholders are eligible to get dividend if the company earns profit. Equity share capital cannot be redeemed during the lifetime of the company. The liability of the equity shareholders is the value of unpaid value of shares.

Features of Equity Shares

Equity shares consist of the following important features:

1. **Maturity of the shares:** Equity shares have permanent nature of capital, which has no maturity period. It cannot be redeemed during the lifetime of the company.

2. **Residual claim on income:** Equity shareholders have the right to get income left after paying fixed rate of dividend to preference shareholder. The earnings or the income available to the shareholders is equal to the profit after tax minus preference dividend.
3. **Residual claims on assets:** If the company wound up, the ordinary or equity shareholders have the right to get the claims on assets. These rights are only available to the equity shareholders.
4. **Right to control:** Equity shareholders are the real owners of the company. Hence, they have power to control the management of the company and they have power to take any decision regarding the business operation.
5. **Voting rights:** Equity shareholders have voting rights in the meeting of the company with the help of voting right power; they can change or remove any decision of the business concern. Equity shareholders only have voting rights in the company meeting and also they can nominate proxy to participate and vote in the meeting instead of the shareholder.
6. **Pre-emptive right:** Equity shareholder pre-emptive rights. The pre-emptive right is the legal right of the existing shareholders. It is attested by the company in the first opportunity to purchase additional equity shares in proportion to their current holding capacity.
7. **Limited liability:** Equity shareholders are having only limited liability to the value of shares they have purchased. If the shareholders are having fully paid up shares, they have no liability. For example: If the shareholder purchased 100 shares with the face value of Rs. 10 each. He paid only Rs. 900. His liability is only Rs. 100.

   Total number of shares 100 Face value of shares Rs. 10

   Total value of shares $100 \times 10 = 1{,}000$ Paid up value of shares 900

   Unpaid value/liability 100

   Liability of the shareholders is only unpaid value of the share (that is Rs. 100).

Advantages of Equity Shares

Equity shares are the most common and universally used shares to mobilize finance for the company. It consists of the following advantages.

1. **Permanent sources of finance:** Equity share capital is belonging to long-term permanent nature of sources of finance, hence, it can be used for long-term or fixed capital requirement of the business concern.
2. **Voting rights:** Equity shareholders are the real owners of the company who have voting rights. This type of advantage is available only to the equity shareholders.
3. **No fixed dividend:** Equity shares do not create any obligation to pay a fixed rate of dividend. If the company earns profit, equity shareholders are eligible for

profit, they are eligible to get dividend otherwise, and they cannot claim any dividend from the company.

4. **Less cost of capital:** Cost of capital is the major factor, which affects the value of the company. If the company wants to increase the value of the company,
they have to use more share capital because, it consists of less cost of capital (K_e) while compared to other sources of finance.
5. **Retained earnings:** When the company have more share capital, it will be suitable for retained earnings which is the less cost sources of finance while compared to other sources of finance.

Disadvantages of Equity Shares

1. **Irredeemable:** Equity shares cannot be redeemed during the lifetime of the business concern. It is the most dangerous thing of over capitalization.
2. **Obstacles in management:** Equity shareholder can put obstacles in management by manipulation and organizing themselves. Because, they have power to contrast any decision which are against the wealth of the shareholders.
3. **Leads to speculation:** Equity shares dealings in share market lead to secularism during prosperous periods.
4. **Limited income to investor:** The Investors who desire to invest in safe securities with a fixed income have no attraction for equity shares.
5. **No trading on equity:**When the company raises capital only with the help of equity, the company cannot take the advantage of trading on equity.

PREFERENCE SHARES

The parts of corporate securities are called as preference shares. It is the shares, which have preferential right to get dividend and get back the initial investment at the time of winding up of the company. Preference shareholders are eligible to get fixed rate of dividendand they do not have voting rights.

Preference shares may be classified into the following major types:

1. **Cumulative preference shares:** Cumulative preference shares have right to claim dividends for those years which have no profits. If the company is unable to earn profit in any one or more years, C.P. Shares are unable to get any dividend but they have right to get the comparative dividend for the previous years if the company earned profit.
2. **Non-cumulative preference shares:** Non-cumulative preference shares have no right to enjoy the above benefits. They are eligible to get only dividend if the company earns profit during the years. Otherwise, they cannot claim any dividend.

3. **Redeemable preference shares:** When, the preference shares have a fixed maturity period it becomes redeemable preference shares. It can be redeemable during the lifetime of the company. The Company Act has provided certain restrictionson the return of the redeemable preference shares.

Irredeemable Preference Shares

Irredeemable preference shares can be redeemed only when the company goes for liquidator.There is no fixed maturity period for such kind of preference shares.

Participating Preference Shares

Participating preference sharesholders haveright to participate extra profits after distributing the equity shareholders.

Non-Participating Preference Shares

Non-participating preference sharesholders are not having any right to participate extra profits after distributing to the equity shareholders. Fixed rate of dividend is payable tothe type of shareholders.

Convertible Preference Shares

Convertible preference sharesholders have right to convert their holding into equity shares after a specific period. The articles of association must authorize the right of conversion.

Non-convertible Preference Shares

There shares, cannot be converted into equity shares from preference shares.

Features of Preference Shares

The following are the important features of the preference shares:

1. **Maturity period:** Normally preference shares have no fixed maturity period except in the case of redeemable preference shares. Preference shares can be redeemable only at the time of the company liquidation.
2. **Residual claims on income:** Preferential sharesholders have a residual claim on income. Fixed rate of dividend is payable to the preference shareholders.
3. **Residual claims on assets:** The first preference is given to the preference shareholders at the time of liquidation. If any extra Assets are available thatshould be distributed to equity shareholder.
4. **Control of Management:** Preference shareholder does not have any voting rights. Hence, they cannot have control over the management of the company.

Advantages of Preference Shares

Preference shares have the following important advantages.

1. **Fixed dividend:** The dividend rate is fixed in the case of preference shares. It is called as fixed income security because it provides a constant rate of incometo the investors.

2. **Cumulative dividends:** Preference shares have another advantage which is called cumulative dividends. If the company does not earn any profit in any previous years, it can be cumulative with future period dividend.
3. **Redemption:** Preference Shares can be redeemable after a specific period except in the case of irredeemable preference shares. There is a fixed maturity period for repayment of the initial investment.
4. **Participation:** Participative preference sharesholders can participate in the surplus profit after distribution to the equity shareholders.
5. **Convertibility:** Convertibility preference shares can be converted into equity shares when the articles of association provide such conversion.

Disadvantages of Preference Shares

1. **Expensive sources of finance:** Preference shares have high expensive source of finance while compared to equity shares.
2. **No voting right:** Generally preference sharesholders do not have any voting rights. Hence they cannot have the control over the management of the company.
3. **Fixed dividend only:** Preference shares can get only fixed rate of dividend. They may not enjoy more profits of the company.
4. **Permanent burden:** Cumulative preference shares become a permanent burden so far as the payment of dividend is concerned. Because the company must pay the dividend for the unprofitable periods also.
5. **Taxation:** In the taxation point of view, preference shares dividend is not a deductible expense while calculating tax. But, interest is a deductible expense. Hence, it has disadvantage on the tax deduction point of view.

DEFERRED SHARES

Deferred shares also called as founder shares because these shares were normally issued to founders. The shareholders have a preferential right to get dividend before the preference shares and equity shares. According to Companies Act 1956 no public limited company or which is a subsidiary of a public company can issue deferred shares.

These shares were issued to the founder at small denomination to control over the management by the virtue of their voting rights.

NO PAR SHARES

When the shares are having no face value, it is said to be no par shares. The company issues this kind of shares which is divided into a number of specific shares without any specific denomination. The value of shares can be measured by dividing the real net worthof the company with the total number of shares.

$$\text{Value of no. per share} = \frac{\text{Therealnetworth}}{\text{Total no.of shares}}$$

CREDITORSHIP SECURITIES

Creditorship Securities also known as debt finance which means the finance is mobilized from the creditors. Debenture and Bonds are the two major parts of the Creditorship Securities.

Debentures

A Debenture is a document issued by the company. It is a certificate issued by the company under its seal acknowledging a debt.

According to the Companies Act 1956, "debenture includes debenture stock, bonds and any other securities of a company whether constituting a charge of the assets of the company or not."

Types of Debentures

Debentures may be divided into the following major types:

1. **Unsecured debentures:** Unsecured debentures are not given any security on assets of the company. It is also called simple or naked debentures. This type of debentures are treaded as unsecured creditors at the time of winding up of the company.
2. **Secured debentures:** Secured debentures are given security on assets of the company. It is also called as mortgaged debentures because these debentures are given against any mortgage of the assets of the company.
3. **Redeemable debentures:** These debentures are to be redeemed on the expiryof a certain period. The interest is paid periodically and the initial investment is returned after the fixed maturity period.
4. **Irredeemable debentures:** These kind of debentures cannot be redeemable during the life time of the business concern.
5. **Convertible debentures:** Convertible debentures are the debentures whose holdershave the option to get them converted wholly or partly into shares. These debentures are usually converted into equity shares. Conversion of the debentures may be:
   Non-convertible debentures Fully convertible
   debentures Partly convertible debentures
6. **Other types:** Debentures can also be classified into the following types. Someof the common types of the debentures are as follows:
   1. Collateral Debenture
   2. Guaranteed Debenture
   3. First Debenture
   4. Zero Coupon Bond
   5. Zero Interest Bond/Debenture

1. **Maturity period:** Debentures consist of long-term fixed maturity period. Normally, debentures consist of 10–20 years maturity period and are repayable with the principle investment at the end of the maturity period.
2. **Residual claims in income:** Debenture holders are eligible to get fixed rate of interest at every end of the accounting period. Debenture holders have priority of claim in income of the company over equity and preference shareholders.
3. **Residual claims on asset:** Debenture holders have priority of claims on Assets of the company over equity and preference shareholders. The Debenture holders may have either specific change on the Assets or floating change of the assets of the company. Specific change of Debenture holders are treated as secured creditors and floating change of Debenture holders are treated as unsecured creditors.
4. **No voting rights:** Debenture holders are considered as creditors of the company. Hence they have no voting rights. Debenture holders cannot have the control over the performance of the business concern.
5. **Fixed rate of interest:** Debentures yield fixed rate of interest till the maturity period. Hence the business will not affect the yield of the debenture.

Advantages of Debenture

Debenture is one of the major parts of the long-term sources of finance which of consists the following important advantages:

1. **Long-term sources:** Debenture is one of the long-term sources of finance to the company. Normally the maturity period is longer than the other sources of finance.
2. **Fixed rate of interest:** Fixed rate of interest is payable to debenture holders, hence it is most suitable of the companies earn higher profit. Generally, the rate of interest is lower than the other sources of long-term finance.
3. **Trade on equity:** A company can trade on equity by mixing debentures in its capital structure and thereby increase its earning per share. When the company apply the trade on equity concept, cost of capital will reduce and value of the company will increase.
4. **Income tax deduction:** Interest payable to debentures can be deducted from the total profit of the company. So it helps to reduce the tax burden of the company.
5. **Protection:** Various provisions of the debenture trust deed and the guidelines issued by the SEB1 protect the interest of debenture holders.

Disadvantages of Debenture

Debenture finance consists of the following major disadvantages:

1. **Fixed rate of interest:** Debenture consists of fixed rate of interest payable to securities. Even though the company is unable to earn profit, they have to pay the fixed rate of interest to debenture holders, hence, it is not suitable to those company earnings which fluctuate considerably.

2. **No voting rights:** Debenture holders do not have any voting rights. Hence, they cannot have the control over the management of the company.
3. **Creditors of the company:** Debenture holders are merely creditors and not the owners of the company. They do not have any claim in the surplus profits of the company.
4. **High risk:** Every additional issue of debentures becomes more risky and costly on account of higher expectation of debenture holders. This enhanced financial risk increases the cost of equity capital and the cost of raising finance through debentures which is also high because of high stamp duty.
5. **Restrictions of further issues:** The company cannot raise further finance through debentures as the debentures are under the part of security of the assets already mortgaged to debenture holders.

INTERNAL FINANCE

A company can mobilize finance through external and internal sources. A new company may not raise internal sources of finance and they can raise finance only external sources such as shares, debentures and loans but an existing company can raise both internal and external sources of finance for their financial requirements. Internal finance is also one of the important sources of finance and it consists of cost of capital while compared to other sources of finance.

Internal source of finance may be broadly classified into two categories:

A. Depreciation Funds
B. Retained earnings

Depreciation Funds

Depreciation funds are the major part of internal sources of finance, which is used to meet the working capital requirements of the business concern. Depreciation means decrease in the value of asset due to wear and tear, lapse of time, obsolescence, exhaustion and accident. Generally depreciation is changed against fixed assets of the company at fixed rate for every year. The purpose of depreciation is replacement of the assets after the expired period. It is one kind of provision of fund, which is needed to reduce the tax burden and overall profitability of the company.

Retained Earnings

Retained earnings are another method of internal sources of finance. Actually is not a method of raising finance, but it is called as accumulation of profits by a company for its expansion and diversification activities.

Retained earnings are called under different names such as; self finance, inter finance, and plugging back of profits. According to the Companies Act 1956 certain percentage, as prescribed by the central government (not exceeding 10%) of the net profits after tax of a

financial year have to be compulsorily transferred to reserve by a company before declaring dividends for the year.

Under the retained earnings sources of finance, a part of the total profits is transferred to various reserves such as general reserve, replacement fund, reserve for repairs and renewals, reserve funds and secrete reserves, etc.

Advantages of Retained Earnings

Retained earnings consist of the following important advantages:

1. **Useful for expansion and diversification**: Retained earnings are most useful to expansion and diversification of the business activities.
2. **Economical sources of finance:** Retained earnings are one of the least costly sources of finance since it does not involve any floatation cost as in the case of raising of funds by issuing different types of securities.
3. **No fixed obligation:** If the companies use equity finance they have to pay dividend and if the companies use debt finance, they have to pay interest. But if the company uses retained earnings as sources of finance, they need not pay any fixed obligation regarding the payment of dividend or interest.
4. **Flexible sources:** Retained earnings allow the financial structure to remain completely flexible. The company need not raise loans for further requirements, if it has retained earnings.
5. **Increase the share value:** When the company uses the retained earnings as the sources of finance for their financial requirements, the cost of capital is very cheaper than the other sources of finance; Hence the value of the share will increase.
6. **Avoid excessive tax:** Retained earnings provide opportunities for evasion of excessive tax in a company when it has small number of shareholders.
7. **Increase earning capacity:** Retained earnings consist of least cost of capital and also it is most suitable to those companies which go for diversification and expansion.

Disadvantages of Retained Earnings

Retained earnings also have certain disadvantages:

1. **Misuses:** The management by manipulating the value of the shares in the stock market can misuse the retained earnings.
2. **Leads to monopolies:** Excessive use of retained earnings leads to monopolistic attitude of the company.
3. **Over capitalization:** Retained earnings lead to over capitalization, because if the company uses more and more retained earnings, it leads to insufficient source of finance.
4. **Tax evasion:** Retained earnings lead to tax evasion. Since, the company reduces tax burden through the retained earnings.

5. **Dissatisfaction:** If the company uses retained earnings as sources of finance, the shareholder can't get more dividends. So, the shareholder does not like to use the retained earnings as source of finance in all situations.

LOAN FINANCING

Loan financing is the important mode of finance raised by the company. Loan finance maybe divided into two types:

(a) Long-Term Sources
(b) Short-Term Sources

Loan finance can be raised through the following important institutions.

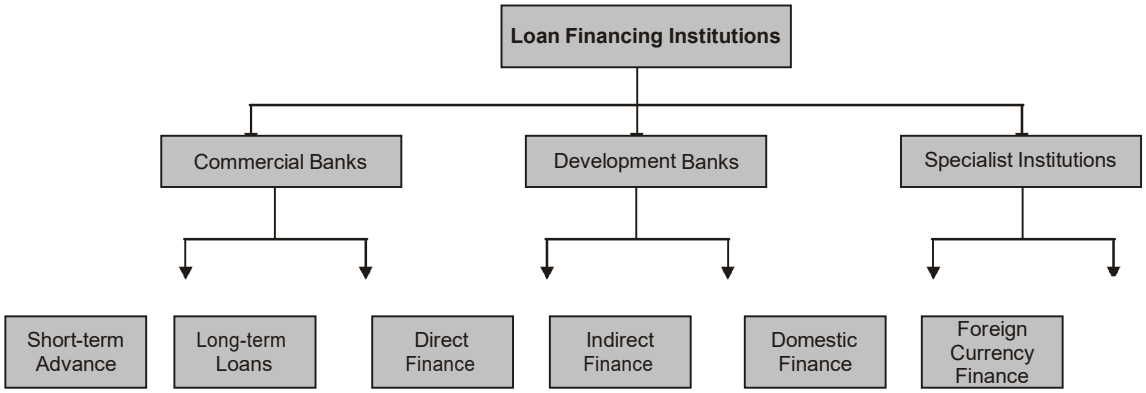


Fig. 3.1 *Loan Financing*

Financial Institutions

With the effect of the industrial revaluation, the government established nation-wide and state-wise financial industries to provide long-term financial assistance to industrial concerns in the country. Financial institutions play a key role in the field of industrial development and they are meeting the financial requirements of the business concern. IFCI, ICICI, IDBI, SFC, EXIM Bank, ECGC are the famous financial institutions in the country.

Commercial Banks

Commercial Banks normally provide short-term finance which is repayable within a year. The major finance of commercial banks is as follows:

Short-term advance: Commercial banks provide advance to their customers with or without securities. It is one of the most common and widely used short-term sources of finance, which are needed to meet the working capital requirement of the company.

It is a cheap source of finance, which is in the form of pledge, mortgage, hypothecation and bills discounted and rediscounted.

Short-term Loans

Commercial banks also provide loans to the business concern to meet the short-term financial requirements. When a bank makes an advance in lump sum against some security it is termed as loan. Loan may be in the following form:

(a) Cash credit: A cash credit is an arrangement by which a bank allows his customer to borrow money up to certain limit against the security of the commodity.

(b) Overdraft: Overdraft is an arrangement with a bank by which a current account holder is allowed to withdraw more than the balance to his credit up to a certain limit without any securities.

Development Banks

Development banks were established mainly for the purpose of promotion and development the industrial sector in the country. Presently, large number of development banks are functioning with multidimensional activities. Development banks are also called as financial institutions or statutory financial institutions or statutory non-banking institutions. Development banks provide two important types of finance:

(a) Direct Finance
(b) Indirect Finance/Refinance

Some of the important development banks are discussed in Chapter 11.

Presently the commercial banks are providing all kinds of financial services including development-banking services. And also nowadays development banks and specialisted financial institutions are providing all kinds of financial services including commercial banking services. Diversified and global financial services are unavoidable to the present day economics. Hence, we can classify the financial institutions only by the structure and set up and not by the services provided by them.

MODEL QUESTIONS

1. Explain the various sources of financing.
2. What is meant by security financing?
3. What is debt financing?
4. Critically examine the advantages and disadvantages of equity shares.
5. Discuss the features of equity shares.
6. What are the merits of the deferred shares?
7. Explain the merits and demerits of preference shares?
8. List out the types of debentures.

9. Evaluate the overall view of debentures.
10. How internal sources of finance is used in the industrial concern?
11. What is retained earnings?
12. Evaluate the advantages and disadvantages of retained earnings.
13. How does depreciation funds help the industrial concern as sources of finance?
14. Evaluate the overall structure of the loan financing?
15. Explain the Commercial Bank financing?
16. Enumerate the major development banks.
17. Explain the role of UTI and LIC in industrial financing?
18. What is cash credit?
19. Mention the functions of IFCI.

Chapter 4 Capitalization

nagement

INTRODUCTION

Financial planning and decision play a major role in the field of financial management which consists of the major area of financial management such as, capitalization, financial structure, capital structure, leverage and financial forecasting.

Financial planning includes the following important parts:

- Estimating the amount of capital to be raised.
- Determining the form and proportionate amount of securities.
- Formulating policies to manage the financial plan.

MEANING OF CAPITAL

The term capital refers to the total investment of the company in terms of money, and assets. It is also called as total wealth of the company. When the company is going to invest large amount of finance into the business, it is called as capital. Capital is the initial and integral part of new and existing business concern.

The capital requirements of the business concern may be classified into two categories:

(a) Fixed capital
(b) Working capital.

Fixed Capital

Fixed capital is the capital, which is needed for meeting the permanent or long-term purpose of the business concern. Fixed capital is required mainly for the purpose of meeting capital expenditure of the business concern and it is used over a long period. It is the amount invested in various fixed or permanent assets, which are necessary for a business concern.

Definition of Fixed Capital

According to the definition of **Hoagland,** "Fixed capital is comparatively easily defined to include land, building, machinery and other assets having a relatively permanent existence".

Character of Fixed Capital

- Fixed capital is used to acquire the fixed assets of the business concern.
- Fixed capital meets the capital expenditure of the business concern.
- Fixed capital normally consists of long period.
- Fixed capital expenditure is of nonrecurring nature.
- Fixed capital can be raised only with the help of long-term sources of finance.

Working Capital

Working capital is the capital which is needed to meet the day-to-day transaction of the business concern. It may cross working capital and net working capital. Normally working capital consists of various compositions of current assets such as inventories, bills, receivable, debtors, cash, and bank balance and prepaid expenses.

According to the definition of **Bonneville,** "any acquisition of funds which increasesthe current assets increase the Working Capital also for they are one and the same".

Working capital is needed to meet the following purpose:

- Purchase of raw material
- Payment of wages to workers
- Payment of day-to-day expenses
- Maintenance expenditure etc.

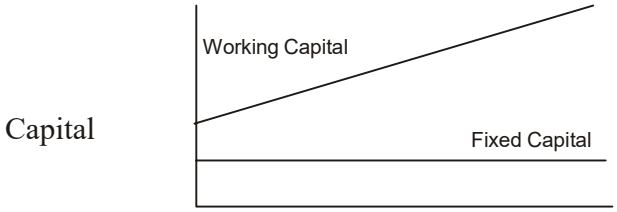


***Fig. 4.1** Position of Capital*

CAPITALIZATION

Capitalization is one of the most important parts of financial decision, which is related to thetotal amount of capital employed in the business concern.

Understanding the concept of capitalization leads to solve many problems in the field of financial management. Because there is a confusion among the capital, capitalization and capital structure.

Meaning of Capitalization

Capitalization refers to the process of determining the quantum of funds that a firm needs to run its business. Capitalization is only the par value of share capital and debenture andit does not include reserve and surplus.

Definition of Capitalization

Capitalization can be defined by the various financial management experts. Some of the definitions are mentioned below:

According to **Guthman and Dougall,** "capitalization is the sum of the par value of stocks and bonds outstanding".

"Capitalization is the balance sheet value of stocks and bonds outstands".

— Bonneville and Dewey

According to **Arhur. S. Dewing,** "capitalization is the sum total of the par value of all shares".

TYPES OF CAPITALIZATION

Capitalization may be classified into the following three important types based on its nature:

- Over Capitalization
- Under Capitalization
- Water Capitalization

Over Capitalization

Over capitalization refers to the company which possesses an excess of capital in relation to its activity level and requirements. In simple means, over capitalization is more capital than actually required and the funds are not properly used.

According to **Bonneville, Dewey and Kelly,** over capitalization means, "when a business is unable to earn fair rate on its outstanding securities".

Example

A company is earning a sum of Rs. 50,000 and the rate of return expected is 10%. This company will be said to be properly capitalized. Suppose the capital investment of the company is Rs. 60,000, it will be over capitalization to the extent of Rs. 1,00,000. The new rate of earning would be:

$$50{,}000/60{,}000 \times 100 = 8.33\%$$

When the company has over capitalization, the rate of earnings will be reduced from 10% to 8.33%.

Causes of Over Capitalization

Over capitalization arise due to the following important causes:

- Over issue of capital by the company.
- Borrowing large amount of capital at a higher rate of interest.
- Providing inadequate depreciation to the fixed assets.

- Excessive payment for acquisition of goodwill.
- High rate of taxation.
- Under estimation of capitalization rate.

Effects of Over Capitalization

Over capitalization leads to the following important effects:

- Reduce the rate of earning capacity of the shares.
- Difficulties in obtaining necessary capital to the business concern.
- It leads to fall in the market price of the shares.
- It creates problems on re-organization.
- It leads under or misutilisation of available resources.

Remedies for Over Capitalization

Over capitalization can be reduced with the help of effective management and systematic design of the capital structure. The following are the major steps to reduce over capitalization.

- Efficient management can reduce over capitalization.
- Redemption of preference share capital which consists of high rate of dividend.
- Reorganization of equity share capital.
- Reduction of debt capital.

Under Capitalization

Under capitalization is the opposite concept of over capitalization and it will occur when the company's actual capitalization is lower than the capitalization as warranted by its earning capacity. Under capitalization is not the so called inadequate capital.

Under capitalization can be defined by **Gerstenberg,** "a corporation may be under capitalized when the rate of profit is exceptionally high in the same industry".

Hoagland defined under capitalization as "an excess of true assets value over the aggregate of stocks and bonds outstanding".

Causes of Under Capitalization

Under capitalization arises due to the following important causes:

- Under estimation of capital requirements.
- Under estimation of initial and future earnings.
- Maintaining high standards of efficiency.
- Conservative dividend policy.
- Desire of control and trading on equity.

Effects of Under Capitalization

Under Capitalization leads certain effects in the company and its shareholders.

- It leads to manipulate the market value of shares.
- It increases the marketability of the shares.

- It may lead to more government control and higher taxation.
- Consumers feel that they are exploited by the company.
- It leads to high competition.

Remedies of Under Capitalization

Under Capitalization may be corrected by taking the following remedial measures:

1. Under capitalization can be compensated with the help of fresh issue of shares.
2. Increasing the par value of share may help to reduce under capitalization.
3. Under capitalization may be corrected by the issue of bonus shares to the existingshareholders.
4. Reducing the dividend per share by way of splitting up of shares.

Watered Capitalization

If the stock or capital of the company is not mentioned by assets of equivalent value, it is called as watered stock. In simple words, watered capital means that the realizable value of assets of the company is less than its book value.

According to **Hoagland's** definition, "A stock is said to be watered when its true value is less than its book value."

Causes of Watered Capital

Generally watered capital arises at the time of incorporation of a company but it also arisesduring the life time of the business. The following are the main causes of watered capital:

1. Acquiring the assets of the company at high price.
2. Adopting ineffective depreciation policy.
3. Worthless intangible assets are purchased at higher price.

MODEL QUESTIONS

1. What is capital and define the capital?
2. Explain the types of capital.
3. What is capitalization?
4. What are the kinds of capitalization?
5. Explain the effects of under capitalization.
6. Discuss the causes of over capitalization.

Chapter 5 Capital Structure

INTRODUCTION

Capital is the major part of all kinds of business activities, which are decided by the size, and nature of the business concern. Capital may be raised with the help of various sources. If the company maintains proper and adequate level of capital, it will earn high profit and they can provide more dividends to its shareholders.

Meaning of Capital Structure

Capital structure refers to the kinds of securities and the proportionate amounts that make up capitalization. It is the mix of different sources of long-term sources such as equity shares, preference shares, debentures, long-term loans and retained earnings.

The term capital structure refers to the relationship between the various long-term source financing such as equity capital, preference share capital and debt capital. Deciding the suitable capital structure is the important decision of the financial management becauseit is closely related to the value of the firm.

Capital structure is the permanent financing of the company represented primarily by long-term debt and equity.

Definition of Capital Structure

The following definitions clearly initiate, the meaning and objective of the capital structures.

According to the definition of **Gerestenbeg,** "Capital Structure of a company refers to the composition or make up of its capitalization and it includes all long-term capital resources".

According to the definition of **James C. Van Horne,** "The mix of a firm's permanent long-term financing represented by debt, preferred stock, and common stock equity".

According to the definition of **Presana Chandra,** "The composition of a firm's financing consists of equity, preference, and debt".

According to the definition of **R.H. Wessel,** "The long term sources of funds employed in a business enterprise".

FINANCIAL STRUCTURE

The term financial structure is different from the capital structure. Financial structure shows the pattern total financing. It measures the extent to which total funds are available to finance the total assets of the business.

Financial Structure = Total liabilities

Or

Financial Structure = Capital Structure + Current liabilities.

The following points indicate the difference between the financial structure and capital structure.

Financial Structures	Capital Structures
1. It includes both long-term and short-term sources of funds	1. It includes only the long-term sources of funds.
2. It means the entire liabilities side of the balance sheet.	2. It means only the long-term liabilities of the company.
3. Financial structures consist of all sources of capital.	3. It consist of equity, preference and retained earning capital.
4. It will not be more important while determining the value of the firm.	4. It is one of the major determinations of the value of the firm.

Example

From the following information, calculate the capitalization, capital structure and financial structures.

Balance Sheet

Liabilities		Assets	
Equity share capital	50,000	Fixed assets	25,000
Preference share capital	5,000	Good will	10,000
Debentures	6,000	Stock	15,000
Retained earnings	4,000	Bills receivable	5,000
Bills payable	2,000	Debtors	5,000
Creditors	3,000	Cash and bank	10,000
	70,000		70,000

(i) Calculation of Capitalization

S. No.	Sources	Amount
1.	Equity share capital	50,000
2.	Preference share capital	5,000
3.	Debentures	6,000
	Capitalization	**61,000**

(ii) Calculation of Capital Structures

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	76.92
2.	Preference share capital	5,000	7.69
3.	Debentures	6,000	9.23
4.	Retained earnings	4,000	6.16
		65,000	**100%**

(iii) Calculation of Financial Structure

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	71.42
2.	Preference share capital	5,000	7.14
3.	Debentures	6,000	8.58
4 .	Retained earnings	4,000	5.72
5.	Bills payable	2,000	2.85
6.	Creditors	3,000	4.29
		70,000	**100%**

OPTIMUM CAPITAL STRUCTURE

Optimum capital structure is the capital structure at which the weighted average cost ofcapital is minimum and thereby the value of the firm is maximum.

Optimum capital structure may be defined as the capital structure or combination ofdebt and equity, that leads to the maximum value of the firm.

Objectives of Capital Structure

Decision of capital structure aims at the following two important objectives:

1. Maximize the value of the firm.
2. Minimize the overall cost of capital.

Forms of Capital Structure

Capital structure pattern varies from company to company and the availability of finance.Normally the following forms of capital structure are popular in practice.

- Equity shares only.
- Equity and preference shares only.
- Equity and Debentures only.
- Equity shares, preference shares and debentures.

FACTORS DETERMINING CAPITAL STRUCTURE

The following factors are considered while deciding the capital structure of the firm.

Leverage

It is the basic and important factor, which affect the capital structure. It uses the fixed cost financing such as debt, equity and preference share capital. It is closely related to the overall cost ofcapital.

Cost of Capital

Cost of capital constitutes the major part for deciding the capital structure of a firm. Normally long- term finance such as equity and debt consist of fixed cost while mobilization. When the cost of capital increases, value of the firm will also decrease. Hence the firm must take careful steps to reduce the cost of capital.

(a) Nature of the business: Use of fixed interest/dividend bearing finance depends upon the nature of the business. If the business consists of long period of operation, it will apply for equity than debt, and it will reduce the cost of capital.

(b) Size of the company: It also affects the capital structure of a firm. If the firm belongs to large scale, it can manage the financial requirements with the help of internal sources. But if it is small size, they will go for external finance. It consists of high cost of capital.

(c) Legal requirements: Legal requirements are also one of the considerations while dividing the capital structure of a firm. For example, banking companies are restricted to raise funds from some sources.

(d) Requirement of investors: In order to collect funds from different type of investors, it will be appropriate for the companies to issue different sources of securities.

Government policy

Promoter contribution is fixed by the company Act. It restricts to mobilize large, long- term funds from external sources. Hence the company must consider government policy regarding the capital structure.

CAPITAL STRUCTURE THEORIES

Capital structure is the major part of the firm's financial decision which affects the value of the firm and it leads to change EBIT and market value of the shares. There is a relationship among the capital structure, cost of capital and value of the firm. The aim of effective capital structure is to maximize the value of the firm and to reduce the cost of capital.

There are two major theories explaining the relationship between capital structure, cost of capital and value of the firm.

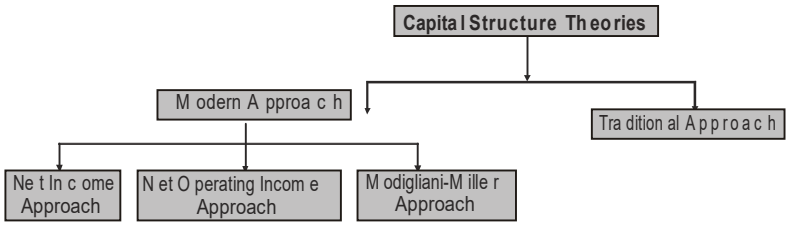


Fig. 5.1 *Capital Structure Theories*

Traditional Approach

It is the mix of Net Income approach and Net Operating Income approach. Hence, it is also called as intermediate approach. According to the traditional approach, mix of debt and equity capital can increase the value of the firm by reducing overall cost of capital up to certain level of debt. Traditional approach states that the K_o decreases only within theresponsible limit of financial leverage and when reaching the minimum level, it startsincreasing with financial leverage.

Assumptions

Capital structure theories are based on certain assumption to analysis in a single andconvenient manner:

- There are only two sources of funds used by a firm; debt and shares.
- The firm pays 100% of its earning as dividend.
- The total assets are given and do not change.
- The total finance remains constant.
- The operating profits (EBIT) are not expected to grow.
- The business risk remains constant.
- The firm has a perpetual life.
- The investors behave rationally.

Exercise 1

ABC Ltd., needs Rs. 30,00,000 for the installation of a new factory. The new factory expects to yield annual earnings before interest and tax (EBIT) of Rs.5,00,000. In choosing a financial plan, ABC Ltd., has an objective of maximizing earnings per share (EPS). The company proposes to issuing ordinary shares and raising debit of Rs. 3,00,000 and Rs. 10,00,000 of Rs. 15,00,000. The current market price per share is Rs. 250 and is expectedto drop to Rs. 200 if the funds are borrowed in excess of Rs. 12,00,000. Funds can be raised at the following rates.

–up to Rs. 3,00,000 at 8%
–over Rs. 3,00,000 to Rs. 15,000,00 at 10%
–over Rs. 15,00,000 at 15%
Assuming a tax rate of 50% advise the company.

Solution

Earnings Before Interest and Tax (BIT) less Interest Earnings Before Tax less: Tax@50%.

Alternatives		
I (Rs. 3,00,000 debt)	I I Rs. 10,00,000 debt)	II I (Rs. 15,00,000 debt)
5,00,000 24,000	5,00,000 1,00,000	5,00,000 2,25,000
4,76,000 2,38,000	4,00,000 2,00,000	2,75,000 1,37,500
2,38,000 27,00,000 250 10800 2,38,000	2,00,000 20,00,000 250 8,000 2,00,000	1,37,500 15,00,000 200 7,500 1,37,500
No. of shares 10,800 Earnings per share 22.03	8,000 25	7,500 18.33

The secure alternative which gives the highest earnings per share is the best. Therefore the company is advised to revise Rs. 10,00,000 through debt amount Rs. 20,00,000 through ordinary shares.

Exercise 2

Compute the market value of the firm, value of shares and the average cost of capital from the following information.

Net operating income Rs. 1,00,000
Total investment Rs. 5,00,000 Equity capitalization Rate:

(a) If the firm uses no debt 10%
(b) If the firm uses Rs. 25,000 debentures 11%
(c) If the firm uses Rs. 4,00,000 debentures 13%

Assume that Rs. 5,00,000 debentures can be raised at 6% rate of interest whereas Rs. 4,00,000 debentures can be raised at 7% rate of interest.

Solution

Computation of market value of firm value of shares and the average cost of capital.

Particulars	(a) No Debt	(b) Rs. 2,50,000 6% debentures	(c) Rs. 4,00,000 7% debentures
Net operating system	1,00,000	1,00,000	1,00,000
(–) Interest (i.e.) Cost of debt	–	15,000	28,000
Earnings available to Equity shareholders	1,00,000	85,000	72,000
Equity Capitalization Rate	10%	11%	13%
Market value of shares	10,000 □ 10 / 100	85,000 □ 100 / 11	72,000 □ 100 / 13
	Rs. 10,00,000/-	Rs.772727/-	Rs.553846/-
Market Value of firm	10,00,000	10,22,727	9,53,846
Average cost of capital	1,00,000 / 10,00,000 □ 100	1,00,000 / 10,22,727 □ 100	1,00,000 / 9,53,846 □ 100
Earnings / Value of the firm			
EBIT / V	=10%	=9.78%	=10.48%

Comments

From the above data, if debt of Rs. 2,50,000 is used, the value of the firm increases and the overall cost of capital decreases. But, if more debt is used to finance in place of equity i.e., Rs. 4,00,000 debentures, the value of the firm decreases and the overall cost of capital increases.

Net Income (NI) Approach

Net income approach suggested by the Durand. According to this approach, the capital structure decision is relevant to the valuation of the firm. In other words, a change in the capital structure leads to a corresponding change in the overall cost of capital as well as the total value of the firm.

According to this approach, use more debt finance to reduce the overall cost of capitaland increase the value of firm.

Net income approach is based on the following three important assumptions:

1. There are no corporate taxes.
2. The cost debt is less than the cost of equity.
3. The use of debt does not change the risk perception of the investor.

where

$V = S+B$

V = Value of firm

S = Market value of equity B = Market value of debt

Market value of the equity can be ascertained by the following formula:

$$S = \frac{NI}{K_e}$$

where

NI=Earnings available to equity shareholder K_e =Cost of equity/equity capitalization rate

Format for calculating value of the firm on the basis of NI approach.

Particulars	Amount
Net operating income (EBIT)	XXX
Less: interest on debenture (i)	XXX
Earnings available to equity holder (NI)	XXX
Equity capitalization rate (K_e)	XXX
Market value of equity (S)	XXX
Market value of debt (B)	XXX
Total value of the firm (S+B)	XXX
Overall cost of capital = K_o = EBIT/V(%)	XXX%

Exercise 3

(a) A Company expects a net income of Rs. 1,00,000. It has Rs. 2,50,000, 8% debentures. The equality capitalization rate of the company is 10%. Calculate the value of the firm and overall capitalization rate according to the net income approach (ignoring income tax).

(b) If the debenture debts are increased to Rs. 4,00,000. What shall be the value of the firm and the overall capitalization rate?

Solution

(a) Capitalization of the value of the firm

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 2,50,000	20,000
Earnings available to equality shareholders	80,000
Equity capitalization rate	10%

$$= \frac{80,000}{10} \square\ 100$$

Market value of equity = 8,00,000 Market value of debentures = 2,50,000 Value of the firm = 10,50,000

Calculation of overall capitalization rate

$$\text{Overall cost of capital } (K_o) = \frac{\text{Earnings}}{\text{Value of the firm}} \quad \frac{\text{EBIT}}{V}$$

$$\frac{1,00,000}{10,50,000} \times 100$$

$$= 9.52\%$$

(b) Calculation of value of the firm if debenture debt is raised to Rs. 3,00,000.

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 4,00,000	32,000
Equity Capitalization rate	68,000
	10%

Market value of equity $= 68,000 \times \frac{100}{10} =$ 6,80,000

$= 6,80,000$

Market value of Debentures $= 4,00,000$

Value of firm $= 10,80,000$

Overall cost of capital $= \frac{1,00,000}{10,80,000} \times 10$

$= 9.26\%$

Thus, it is evident that with the increase in debt financing, the value of the firm has increased and the overall cost of capital has increased.

Net Operating Income (NOI) Approach

Another modern theory of capital structure, suggested by **Durand**. This is just the opposite to the Net Income approach. According to this approach, Capital Structure decision is irrelevant to the valuation of the firm. The market value of the firm is not at all affected by the capital structure changes.

According to this approach, the change in capital structure will not lead to any change in the total value of the firm and market price of shares as well as the overall cost of capital.

NI approach is based on the following important assumptions; The overall cost of capital remains constant;

There are no corporate taxes;

The market capitalizes the value of the firm as a whole;

Value of the firm (V) can be calculated with the help of the following formula

$$V = \frac{EBIT}{K_o}$$

Where,

V = Value of the firm

EBIT = Earnings before interest and tax

K_o = Overall cost of capital

Exercise 4

XYZ expects a net operating income of Rs. 2,00,000. It has 8,00,000, 6% debentures. The overall capitalization rate is 10%. Calculate the value of the firm and the equity capitalization rate (Cost of Equity) according to the net operating income approach.

If the debentures debt is increased to Rs. 10,00,000. What will be the effect on volume of the firm and the equity capitalization rate?

Solution

Net operating income = Rs. 2,00,000

Overall cost of capital = 10%

Market value of the firm (V)

$$= \frac{EBIT}{K_o}$$

$$= 2,00,000 \times \frac{100}{10} = \text{Rs. } 20,00,000$$

Market value of the firm = Rs. 20,00,000

Less: market value of Debentures = Rs. 8,00,000

12,00,000

Equity capitalization rate (or) cost of equity (Ke)

$$= \frac{EBIT - I}{V - D}$$

Where, V = value of the firm

D = value of the debt capital

$$= \frac{2,00,000 - 48,000}{20,00,000 - 8,00,000} \times 100$$

$$= 12.67\%$$

If the debenture debt is increased to Rs. 10,00,000, the value of the firm shall remain changed to Rs. 20,00,000. The equity capitalization rate will increase as follows:

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 60,000}{20,00,000 - 10,00,000} \times 100$$

$$= \frac{1,40,000}{10,00,000} \times 100$$

$$= 14\%.$$

Exercise 5

Abinaya company Ltd. expresses a net operating income of Rs. 2,00,000. It has Rs. 8,00,000 to 7% debentures. The overall capitalization rate is 10%.

(a) Calculate the value of the firm and the equity captialization rate (or) cost of equity according to the net operating income approach.

(b) If the debenture debt is increasesd to Rs. 12,00,000. What will be the effect on the value of the firm, the equity capitalization rate?

Solution

(a) Net operating income = Rs. 2,00,000 Over all cost of capital = 10%

Market value of the firm (V)

$$\frac{NOI(EBIT)}{\text{Overall cost of capital}(OK)}$$

$$= 2,00,000 \times 100/10$$

$$= \text{Rs. } 20,00,000$$

Market value of firm = Rs. 20,00,000 Less Market value of debentures = Rs. 8,00,000 Total marketing value of equity = Rs. 12,00,000 Equity capitalization rate (or) cost of equity (K_e)

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 56,000}{20,00,000 - 8,00,000} \times 100$$

$$= \frac{1,44,000}{12,00,000} \times 100$$

$$= 12\%$$

where I = Interest of debt V = Value of the firm
D = Value of debt capital
I = 8,00,000×7%=56,000
V = 20,00,000
D = 8,00,000

(b) If the debenture debt is increased at Rs. 12,00,000, the value of the firm shall changed to Rs. 20,00,000.

Equity Capitalization Rate (K_e)

$$= \frac{EBIT - I}{V - D}$$

$$= \frac{2,00,000 - 84,000}{20,00,000 - 12,00,000}$$

$$= 14.5\%$$

where I= 12,00,000 at 7% = 84,000

Modigliani and Miller Approach

Modigliani and Miller approach states that the financing decision of a firm does not affect the market value of a firm in a perfect capital market. In other words MM approach maintains that the average cost of capital does not change with change in the debt weighted equity mix or capital structures of the firm.

Modigliani and Miller approach is based on the following important assumptions:

- There is a perfect capital market.
- There are no retained earnings.
- There are no corporate taxes.
- The investors act rationally.
- The dividend payout ratio is 100%.
- The business consists of the same level of business risk.

Value of the firm can be calculated with the help of the following formula:

$$\frac{EBIT}{}(1 - t)K_o$$

Where

EBIT = Earnings before interest and tax K_o = Overall cost of capital
t = Tax rate

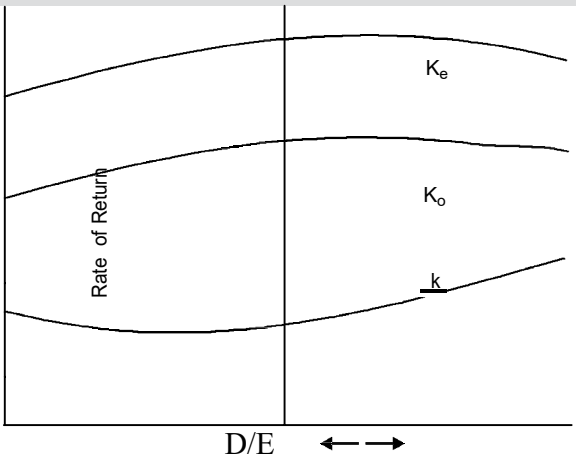


Fig. 5.2 *Modigliani and Miller Approach*

Exercise 6

There are two firms 'A' and 'B' which are exactly identical except that A does not use any debt in its financing, while B has Rs. 2,50,000 , 6% Debentures in its financing. Both the firms have earnings before interest and tax of Rs. 75,000 and the equity capitalization rate is 10%. Assuming the corporation tax is 50%, calculate the value of the firm.

Solution

The market value of firm A which does not use any debt.

$$V_u = \frac{EBIT}{K_o}$$

$$= \frac{75,000}{10/100} = 75,000 \times 100/10$$

$$= \text{Rs. } 7,50,000$$

The market value of firm B which uses debt financing of Rs. 2,50,000

$$V_t = V_u + t$$

$V_u = 7,50,000$, $t = 50\%$ of Rs. 2,50,000

$$= 7,50,000 + 1,25,000$$

$$= \text{Rs. } 8,75,000$$

Exercise 7

The following data regarding the two companies 'X' and 'Y' belonging to the sameequivalent class:

	Company 'X'	Company 'Y'
Number of ordinary shares	75,000	1,25,000
5% debentures	40,000	–
Market price per shares	Rs. 1.25	Rs. 1.00
Profit before interest	Rs. 25,000	Rs. 25,000

All profits after paying debenture interest are distributed as dividends.

Youarerequired to explain how under Modiglianiand Miller approach, an investorholding 10% of shares in company 'X' will be better off in switching his holding to company 'Y'.

Solution

As per the opinion of Modigliani and Miller, two similar firms in all respects except their capital structure cannot have different market values because of arbitrage process. In case two similar firms except for their capital structure have different market values, arbitrage will take place and the investors will engage in 'personal leverage' as against the corporate leverage. In the given problem, the arbitrage will work out as below.

1. The investor will sell in the market 10% of shares in company 'X' for
   75,000×10/100×1.25=Rs. 9375
2. He will raise a loan of Rs. 40,000×10/100=Rs. 4000

To take advantage of personal leverage as against the corporate leverage the company 'Y' does not use debt content in its capital structure. He will put 13375 shares in company'Y' with the total amount realized from 1 and 2 i.e., Rs. 9375 plus Rs. 4000. Thus he will have 10.7% of shares in company 'Y'.

The investor will gain by switching his holding as below:

Present income of the investor in company 'X'	**Rs.**
Profit before Interest of the Company	25,000
Less: Interest on Debentures 5%	2,000
Profit after Interest	23,000

Share of the investor = 10% of Rs. 23,000 i.e., Rs. 2300

Income of the investor after switching holding to company

Profit before Interest of the company	Rs. 25,000
Less Interest	——
Profit after Interest	25,000
Share of the investor : $25,000\times\frac{13,375}{1,25,000}$	= Rs. 2,675
Interest paid on loan taken 4000×5/100	200
Net Income of the Investor	**2,475**

As the cost of income of the investor in company 'Y' is higher than the cost of income from company 'X' due to switching the holding, the investor will gain in switching his holdings to company 'Y'.

Exercise 8

Paramount Products Ltd. wants to raise Rs. 100 lakh for diversification project. Current estimates of EBIT from the new project is Rs. 22 lakh p.a.

Cost of debt will be 15% for amounts up to and including Rs. 40 lakh, 16% for additional amounts up to and including Rs. 50 lakh and 18% for additional amounts above Rs. 50 lakh. The equity shares (face value of Rs. 10) of the company have a current market value of Rs. 40. This is expected to fall to Rs. 32 if debts exceeding Rs. 50 lakh are raised. The following options are under consideration of the company.

Option	Debt	Equity
I	50%	50%
II	40%	60%
III	60%	40%

Determine EPS for each option and state which option should the Company adopt. Tax rate is 50%.

(ICWA Inter Dec. 1997)

Solution

	I	II	III
Equity	50,00,000	60,00,000	40,00,000
Debt	50,00,000	40,00,000	60,00,000
Amount to be raised	1,00,00,000	1,00,00,000	1,00,00,000
EBIT	22,00,000	22,00,000	22,00,000
Less: Interest of Debt	7,60,000	6,00,000	9,40,000
PBT	14,40,000	16,00,000	12,60,000
Less : Tax @ 50%	7,20,000	8,00,000	6,30,000
PAT	7,20,000	8,00,000	6,30,000
No. of equity shares	1,25,000	1,50,000	1,25,000
	Rs. 5.76	Rs. 5.33	Rs. 5.04

Working Notes

Calculation of Interest on Debt

Total Debt	I	II	III
Interest on:	50,00,000	40,00,000	60,00,000
Ist Rs. 40,00,000 @ 15%	6,00,000	6,00,000	6,00,000
Next Rs.10,00,000 @ 16%	1,60,000	–	1,60,000
Balance Rs. 10,00,000 @ 18%	–	–	1,80,000
	7,60,000	6,00,000	9,40,000

Exercise 9

The following is the data regarding two Company's. X and Y belonging to the samerisk class.

	X	Y
No. of ordinary shares	90,000	1,50,000
Market price/share (Rs.)	1.2	1.0
6% debentures	60,000	–
Profit before interest	18,000	18,000

All profits after interest are distributed as dividend.

Explain how under Modigliani & Miller Approach an investor holding 10% of shares in Company X will be better off in switching his holding to Company Y.

(CA Final Nov. 1993)

Solution

Both the firms have EBIT of Rs. 18,000. Company X has to pay interest of Rs. 3600 (i.e., 6% on Rs. 60,000) and the remaining profit of Rs. 14,400 is being distributed among the shareholders. The Company Y on the other hand has no interest liability and therefore is distributing Rs.18,000 among the shareholders.

The investor will be well off under MM Model by selling the shares of X and shifting to shares of Y company through the arbitrage process as follows. If he sells shares of X Company He gets Rs. 10,800 (9,000 shares @ Rs.1.2 per share). He now takes a 6% loan of Rs.6,000

(*i.e.* 105 of Rs. 60,000) and out of the total cash of Rs. 16,800 he purchases 10% of shares of Company Y for Rs. 15,000; his position with regard to Company Y would be as follows:

	X	Y
Dividends (10% of Profits)	1,440	1,800
Less:Interest (6% on Rs. 6,000)	0	360
Net Income	1,440	1,440

Thus by shifting from Company Y the investor is able to get the same income of Rs. 1,440 and still having funds of Rs. 1,800 (i.e., Rs. 16,800 – 15,000) at his disposal. He is better off not in terms of income but in terms of having capital of Rs. 1,800 with him which he can invest elsewhere.

Exercise 10

Gentry Motors Ltd., aproducer of turbine generators,is inthissituation; EBIT= Rs. 40 lac. rate =35%, dept. outstanding = D = Rs. 20 lac., rate of Interest =10%, K_e = 15%, shares of stock outstanding = No. = Rs. 6,00,000 and book value per share = Rs. 10. Since Gentry's productmarket is stable andthe Company expects no growth, all earnings are paid out as dividends. The debt consists of perpetual bonds. What are the Gentry's EBS and its price per share, P_o? **(CS Final Dec. 1998)**

Solution

(a) EBIT	40,00,000	
interest @ 10%	2,00,000	
	38,00,000	
Tax @ 35%	13,30,000	
	24,70,000	
No. of shares		6,00,000
EPS (or Dividend)		Rs. 4.12
Ke (given)		15%
P_o (*i.e.*, D/K_e)		4.12/.15
		Rs. 27.47

In the same question if the Company increases its debt by Rs. 80 lakh to a total of Rs. 1 crore using the new debt to buy and retire of its shares at current price, its interest rateon debt will be 12% and its cost of equity will rise from 15% to 17%. EBIT will remain constant, should this Company change its capital structure.

If Company decides to increase its debt by Rs. 80 lacs, the Company may buy back 80,00,000 □ 27.47 = 2,91,226 shares. Thereafter the remaining no. of shares would be 3,08,774 (*i.e.*, 6,00,000 – 2,91,226).

The market price of the share may be ascertained as follows:

EBIT	40,00,000
Interest @ 12% on Rs. 1 crore	12,00,000
	28,00,000
Tax @ 35%	9,80,000
	18,20,000
No. of equity shares	3,08,774
EPS	Rs. 5.89
Ke	17%
Po (*i.e.*, D/Ke)	5.89
	.17
	= Rs. 34.64

As the price is expected to rise from 27.47 to Rs 34.64, the Company may change its capital structure by raising debt and retaining some number of shares.

1. Define capital structure.
2. Differentiate the capital structure and financial structure.
3. What is optimum capital structure?
4. Discuss the various factors affecting the capital structure.
5. Explain the capital structure theories.
6. XYZ Ltd., expects a net income of Rs. 1,50,000. The company has 10% of 5,00,000 Debentures. The equity capitalization rate of the company is 10%.
   (a) Calculate the value of the firm and overall capitalization rate according tothe net income approach (ignoring income tax).
   (b) If the debenture debt is increased to Rs. 7,50,000 and interest of debt is changeto 9%. What is the value of the firm and overall capitalization rate?

   (**Ans.** (a) Rs. 15,00,000, 10% (b) Rs. 15,75,000 and 9.52%)
7. A Company Ltd., projected net operating income of Rs. 75,000. It has Rs. 3,00,000, 8% debentures.
   (a) Calculate the value of the firm according to 10 net opening income and overallcapitalization rate is 10%.
   (b) If debenture debt is increased to Rs. 5,00,000. What is the value of the firm andthe equity capitalization rate? (**Ans.** (a) Rs. 7,50,000, (b) 11.33%, 14%)
8. According to Traditional approach, compute the market value of the firm, valueof shares and the average cost of capital from the following information:
   Net Operating Income 1,00,000Total Investment

   7,00,000 Equity capitalization Rate:

   (a) if the firms uses no debt 7%.
   (b) if the firm uses Rs. 2,00,000 debentures 8%
   (c) if the firm uses Rs. 4,00,000 debentures 9%

   Assume that Rs 2,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 7% rate of interest. (**Ans.** 7%, 7.69%, 8.33)

Chapter 6

Cost of Capital

INTRODUCTION

Cost of capital is an integral part of investment decision as it is used to measure the worth of investment proposal provided by the business concern. It is used as a discount rate in determining the present value of future cash flows associated with capital projects. Cost of capital is also called as cut-off rate, target rate, hurdle rate and required rate of return. When the firms are using different sources of finance, the finance manager must take careful decision with regard to the cost of capital; because it is closely associated with the value of the firm and the earning capacity of the firm.

Meaning of Cost of Capital

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings. If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of the shareholders.

Definitions

The following important definitions are commonly used to understand the meaning and concept of the cost of capital.

According to the definition of **John J. Hampton** " Cost of capital is the rate of return the firm required from investment in order to increase the value of the firm in the market place".

According to the definition of **Solomon Ezra,** "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditure".

According to the definition of James **C. Van Horne**, Cost of capital is "A cut-off rate for the allocation of capital to investment of projects. It is the rate of return on a project thatwill leave unchanged the market price of the stock".

According to the definition of **William and Donaldson**, "Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due".

Assumption of Cost of Capital

Cost of capital is based on certain assumptions which are closely associated while calculatingand measuring the cost of capital. It is to be considered that there are three basic concepts:

1. It is not a cost as such. It is merely a hurdle rate.
2. It is the minimum rate of return.
3. It consis of three important risks such as zero risk level, business risk and financial risk.Cost of capital can be measured with the help of the following equation.

$$K = r_j + b + f.$$

Where,

K = Cost of capital.

r_j = The riskless cost of the particular type of finance. b = The business risk premium.

f = The financial risk premium.

CLASSIFICATION OF COST OF CAPITAL

Cost of capital may be classified into the following types on the basis of nature and usage:

- Explicit and Implicit Cost.
- Average and Marginal Cost.
- Historical and Future Cost.
- Specific and Combined Cost.

Explicit and Implicit Cost

The cost of capital may be explicit or implicit cost on the basis of the computation of costof capital.

Explicit cost is the rate that the firm pays to procure financing. This may be calculatedwith the help of the following equation;

$$CI_o = \sum_{t=1}^{n} \frac{CO_t}{(t \square C)t}$$

Where,

CI_o = initial cash inflow

C = outflow in the period concerned

N = duration for which the funds are provided T = tax rate

Implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be forgone if the projects presently under consideration by the firm were accepted.

Average and Marginal Cost

Average cost of capital is the weighted average cost of each component of capital employed by the company. It considers weighted average cost of all kinds of financing such as equity, debt, retained earnings etc.

Marginal cost is the weighted average cost of new finance raised by the company. It is the additional cost of capital when the company goes for further raising of finance.

Historical and Future Cost

Historical cost is the cost which as already been incurred for financing a particular project. It is based on the actual cost incurred in the previous project.

Future cost is the expected cost of financing in the proposed project. Expected cost is calculated on the basis of previous experience.

Specific and Combine Cost

The cost of each sources of capital such as equity, debt, retained earnings and loans is called as specific cost of capital. It is very useful to determine the each and every specific source of capital.

The composite or combined cost of capital is the combination of all sources of capital. It is also called as overall cost of capital. It is used to understand the total cost associated with the total finance of the firm.

IMPORTANCE OF COST OF CAPITAL

Computation of cost of capital is a very important part of the financial management to decide the capital structure of the business concern.

Importance to Capital Budgeting Decision

Capital budget decision largely depends on the cost of capital of each source. According to net present value method, present value of cash inflow must be more than the present value of cash outflow. Hence, cost of capital is used to capital budgeting decision.

Importance to Structure Decision

Capital structure is the mix or proportion of the different kinds of long term securities. A firm uses particular type of sources if the cost of capital is suitable. Hence, cost of capital helps to take decision regarding structure.

Cost of capital is one of the important determine which affects the capital budgeting, capital structure and value of the firm. Hence, it helps to evaluate the financial performance of the firm.

Importance to Other Financial Decisions

Apart from the above points, cost of capital is also used in some other areas such as, market value of share, earning capacity of securities etc. hence, it plays a major part in the financial management.

COMPUTATION OF COST OF CAPITAL

Computation of cost of capital consists of two important parts:

1. Measurement of specific costs
2. Measurement of overall cost of capital

Measurement of Cost of Capital

It refers to the cost of each specific sources of finance like:

- Cost of equity
- Cost of debt
- Cost of preference share
- Cost of retained earnings

Cost of Equity

Cost of equity capital is the rate at which investors discount the expected dividends of the firm to determine its share value.

Conceptually the cost of equity capital (K_e) defined as the "Minimum rate of return that a firm must earn on the equity financed portion of an investment project in order to leave unchanged the market price of the shares".

Cost of equity can be calculated from the following approach:

- Dividend price (D/P) approach
- Dividend price plus growth (D/P + g) approach
- Earning price (E/P) approach
- Realized yield approach.

Dividend Price Approach

The cost of equity capital will be that rate of expected dividend which will maintain the present market price of equity shares.

Dividend price approach can be measured with the help of the following formula:

$$K_e = \frac{D}{N_p}$$

Where,

K_e = Cost of equity capital

D = Dividend per equity share

N_p = Net proceeds of an equity share

Exercise 1

A company issues 10,000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 25% dividend to equity shareholders for the past five years and expects to maintain the same in the future also. Compute the cost of equity capital. Will it make any difference if the market price of equity share is Rs. 175?

Solution

$$K_e = \frac{D}{N_p}$$

$$= \frac{25}{100} \times 100$$

$$= 22.72\%$$

If the market price of a equity share is Rs. 175.

$$K_e = \frac{D}{N_p}$$

$$= \frac{25}{175} \times 100$$

$$= 14.28\%$$

Dividend Price Plus Growth Approach

The cost of equity is calculated on the basis of the expected dividend rate per share plus growth in dividend. It can be measured with the help of the following formula:

$$K_e = \frac{D}{N_p} + g$$

Where,

K_e = Cost of equity capital

D = Dividend per equity share g = Growth in expected dividend

N_p = Net proceeds of an equity share

Exercise 2

(a) A company plans to issue 10000 new shares of Rs. 100 each at a par. The floatation costs are expected to be 4% of the share price. The company pays a dividend of Rs. 12 per share initially and growth in dividends is expected to be 5%. Compute the cost of new issue of equity shares.

(b) If the current market price of an equity share is Rs. 120. Calculate the cost of existing equity share capital

Solution

(a) $$K_e = \frac{D}{N_p} + g$$

$$= \frac{12}{100 - 4} + 5 = 17.5\%$$

(b) $$K_e = \frac{D}{N_p} + g$$

$$= \frac{12}{120} + 5\% = 15\%$$

Exercise 3

The current market price of the shares of A Ltd. is Rs. 95. The floatation costs are Rs. 5 per share amounts to Rs. 4.50 and is expected to grow at a rate of 7%. You are required to calculate the cost of equity share capital.

Solution

Market price Rs. 95Dividend Rs.

4.50

Growth 7%.

$$K_e = \frac{D}{N_p} + g$$

$$= \frac{4.50}{95} \times 100 + 7\%$$

$$= 4.73\% + 7\% = 11.73\%$$

Earning Price Approach

Cost of equity determines the market price of the shares. It is based on the future earning prospects of the equity. The formula for calculating the cost of equity according to this approach is as follows.

$$K_e = \frac{E}{N_p}$$

Where,

K_e = Cost of equity capital E = Earning per share

N_p = Net proceeds of an equity share

Exercise 4

A firm is considering an expenditure of Rs. 75 lakhs for expanding its operations. The relevant information is as follows :

Number of existing equity shares =10 lakhs Market value of existing share =Rs.100

Net earnings =Rs.100 lakhs

Compute the cost of existing equity share capital and of new equity capital assuming that new shares will be issued at a price of Rs. 92 per share and the costs of new issue will be Rs. 2 per share.

Solution

Cost of existing equity share capital:

$$K_e = \frac{E}{NP}$$

$$\text{Earnings Per Share(EPS)} = \frac{100 \text{ lakhs}}{10 \text{ lakhs}} = Rs.10$$

$$K_e = \frac{10}{100} \times 10$$

$$= 10\%$$

Cost of Equity Capital

$$K_e = \frac{E}{N}$$

$$= \frac{P}{\frac{10}{92 - 2}} \times 100$$

$$= 11.11\%$$

Realized Yield Approach

It is the easy method for calculating cost of equity capital. Under this method, cost of equity is calculated on the basis of return actually realized by the investor in a company on their equity capital.

$$K_e = PVf \times D$$

Where,

K_e = Cost of equity capital.

PVf = Present value of discount factor. D = Dividend per share.

Cost of Debt

Cost of debt is the after tax cost of long-term funds through borrowing. Debt may be issuedat par, at premium or at discount and also it may be perpetual or redeemable.

Debt Issued at Par

Debt issued at par means, debt is issued at the face value of the debt. It may be calculatedwith the help of the following formula.

$$K_d = (1 - t)\, R$$

Where,

K_d = Cost of debt capital t = Tax rate

R = Debenture interest rate

Debt Issued at Premium or Discount

If the debt is issued at premium or discount, the cost of debt is calculated with the help ofthe following formula.

$$K_d = \frac{I}{N_p}(1 - t)$$

Where,

K_d = Cost of debt capital

I = Annual interest payable N_p =Netproceeds of debenture

t = Tax rate

Exercise 5

(a) A Ltd. issues Rs. 10,00,000, 8% debentures at par. The tax rate applicable to thecompany is 50%. Compute the cost of debt capital.

(b) B Ltd. issues Rs. 1,00,000, 8% debentures at a premium of 10%. The tax rateapplicable to the company is 60%. Compute the cost of debt capital.

(c) A Ltd. issues Rs. 1,00,000, 8% debentures at a discount of 5%. The tax rateis 60%, compute the cost of debt capital.

(d) B Ltd. issues Rs. 10,00,000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate applicable is 50%. Compute the cost of debt-capital.

In all cases, we have computed the after-tax cost of debt as the firm saves on accountof tax by using debt as a source of finance.

Solution

(a) $K_{da} = \frac{I}{Np}(1-t)$

$$= \frac{8,000}{1,00,000} \times (1 - 0.5)$$

$$= \frac{8,000}{1,00,000} \times 0.5$$

$$= 4\%$$

$$K_{da} = \frac{I}{N_p}(1 - t)$$

(b) N_p = Face Value + Premium = 1,00,000+10,000=1,10,000

$$= \frac{8,000}{1,10,000} \times (1 - 0.6)$$

$$\frac{8,000}{1,10,000} \times 0.6$$

$$= 2.91\%$$

(c) $$K_{da} = \frac{I}{N_p}(1 - t)$$

$$= \frac{8,000}{95,000} \times (1 - t)$$

$$= 3.37\%$$

(d) $$K_{da} = \frac{I}{N}(1 - t), N = \text{Rs. } (10,00,000 + 1,00,000) \times \frac{2}{100}$$

$$= \frac{90,000}{10,78,000} \times (1 - 0.5)$$

$$= 4.17\% = 11,00,000 - 22,000 = \text{Rs. } 10,78,000$$

Cost of Perpetual Debt and Redeemable Debt

It is the rate of return which the lenders expect. The debt carries a certain rate of interest.

$$K_{db} = \boxed{\frac{I + 1/n(P - N_p)n}{1/n(P + N_p)/2}}$$

Where,

I = Annual interest payable P = Par value of debt

N_p = Net proceeds of the debenture n = Number of years to maturity

K_{db} = Cost of debt before tax.

Cost of debt after tax can be calculated with the help of the following formula:

$$K_{da} = K_{db} \times (1-t)$$

Where,

K_{da} = Cost of debt after tax K_{db} = Cost of debt before tax

t = Tax rate

Exercise 6

A company issues Rs. 20,00,000, 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 50,000. The debentures are redeemable after 8 years. Calculate before tax and after tax. Cost of debt assuring a tax rate of 55%.

Solution

$$K_{db} = \frac{I + 1/n (P - N_p)}{1/2(P + Np)}$$

$$= \frac{20,00,000 + 1/8(20,00,000 - 18,50,000)}{1/2(20,00,000 + 18,50,000)}$$

Note Np = 20,00,000 – 10,00,000 – 50,000

$$= \frac{2,00,000 + 18750}{19,25,000}$$

= 11.36%.

After Tax Cost of Debt K_{db}

$= K_{da} (1 – t)$

=11.36 (1– 0.55)

=5.11%.

Cost of Preference Share Capital

Cost of preference share capital is the annual preference share dividend by the net proceeds from the sale of preference share.

There are two types of preference shares irredeemable and redeemable. Cost of redeemable preference share capital is calculated with the help of the following formula:

$$K_p = \frac{D_p}{N_p}$$

Where,

K_p = Cost of preference share D_p

=Fixed preference dividend

N_p = Net proceeds of an equity share

Cost of redeemable preference share is calculated with the help of the following formula:

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

Where,

K_p = Cost of preference share D_p = Fixed preference share P = Par value of debt

N_p = Net proceeds of the preference share n = Number of maturity period.

Exercise 7

XYZ Ltd. issues 20,000, 8% preference shares of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference share capital if these shares are issued (a) at par, (b) at a premium of 10% and (c) of a debentures of 6%.

Solution

Cost of preference share capital $K_p = \frac{D}{N_p}$

(a) $K_p = \frac{1,60,000}{20,00,000} \times 100$

$= \frac{1,60,000}{20,00,000} \times 100$

$= 8.16\%$

(b) $K_p = \frac{1,60,000}{20,00,000 - 40,000} \times 100$

$= \frac{1,60,000}{19,60,000} \times 100$

$= 8.16\%$

(c) $I K_p = \frac{1,60,000}{20,00,000 - 1,20,000 - 40,000} \times 100$

$= \frac{1,60,000}{18,40,000} \times 100$

$= 8.69\%$

Exercise 8

ABC Ltd. issues 20,000, 8% preference shares of Rs. 100 each. Redeemable after 8 years at a premium of 10%. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

$$= \frac{1,60,000 \square 1/8\ (22,00,000 \square 19,60,000)}{1/2(22,00,000 \square 19,60,000)}$$

$$= \frac{1,60,000 \square 30,000}{20,80,000}$$

$$= 9.13\%$$

where $D_p = 20,000 \times 100 \times 8\% = 1,60,000$

$P = 20,00,000 + 2,00,000 = 22,00,00$

$N_p = 20,00,000 - 40,000 = 19,60,000$

$n = 8$ years

Exercise 9

ABC Ltd. issues 20,000, 8% preference shares of Rs. 100 each at a premium of 5% redeemable after 8 years at par. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

Solution

$$K_p = \frac{D_p + (P - N_p)/n}{(P + N_p)/2}$$

$$= \frac{1,60,000 \square 1/8\ (20,00,000 \square 20,60,000)}{1/2\ (20,00,000 \square 20,60,000)}$$

$$= \frac{1,60,000 - 7,500}{20,30,000}$$

$$= 7.51\%$$

where $D_p = 20,000 \times 100 \times 8\% = 1,60,000$ $P = 20,00,000$

$n = 8$ years

$N_p = 20,00,000 + 10,00,000 - 40,000 = 20,60,000$

Cost of Retained Earnings

Retained earnings is one of the sources of finance for investment proposal; it is different from other sources like debt, equity and preference shares. Cost of retained earnings is the same as the cost of an equivalent fully subscripted issue of additional shares, which is measured by the cost of equity capital. Cost of retained earnings can be calculated with the help of the following formula:

$$K_r = K_e\ (1 - t)\ (1 - b)$$

Where,

K_r = Cost of retained earnings K_e = Cost of equity

t = Tax rate

b = Brokerage cost

Exercise 10

A firm's K_e (return available to shareholders) is 10%, the average tax rate of shareholders is 30% and it is expected that 2% is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution

Cost of Retained Earnings, $K_r = K_e (1 - t) (1 - b)$ Where,

K_e = rate of return available to shareholders t = tax rate

b = brokerage cost

So, $K_r = 10\% (1 - 0.5) (1 - 0.02)$

$= 10\% \times 0.5 \times 0.98$

$= 4.9\%$

Measurement of Overall Cost of Capital

It is also called as weighted average cost of capital and composite cost of capital. Weighted average cost of capital is the expected average future cost of funds over the long run found by weighting the cost of each specific type of capital by its proportion in the firms capital structure.

The computation of the overall cost of capital (K_o) involves the following steps.

(a) Assigning weights to specific costs.

(b) Multiplying the cost of each of the sources by the appropriate weights.

(c) Dividing the total weighted cost by the total weights.

The overall cost of capital can be calculated with the help of the following formula;

$$K_o = K_d W_d + K_p W_p + K_e W_e + K_r W_r$$

Where,

K_o = Overall cost of capital K_d = Cost of debt

K_p = Cost of preference share K_e = Cost of equity

K_r = Cost of retained earnings

W_d = Percentage of debt of total capital

W_p = Percentage of preference share to total capital W_e = Percentage of equity to total capital

W_r = Percentage of retained earnings

Weighted average cost of capital is calculated in the following formula also:

$$K_w \quad \frac{\Sigma XW}{\Sigma W}$$

Where,

K_W = Weighted average cost of capital X = Cost of specific sources of finance

W = Weight, proportion of specific sources of finance.

Exercise 11

A firm has the following capital structure and after-tax costs for the different sources of funds used :

Source of Funds	Amount Rs.	Proportion %	After-tax cost %
Debt	12,000	20	4
Preference Shares	15,000	25	8
Equity Shares	18,000	30	12
Retained Earnings	15,000	25	11
Total	60,000	100	

You are required to compute the weighted average cost of capital.

Exercise 12

A company has on its books the following amounts and specific costs of each type of capital.

Type of Capital	Book Value Rs.	Market Value Rs.	Specific Costs (%)
Debt	4,00,000	3,80,000	5
Preference	1,00,000	1,10,000	8
Equity	6,00,000	9,00,000	15
Retained Earnings	2,00,000	3,00,000	13
	13,00,000	16,90,000	

Determine the weighted average cost of capital using:

(a) Book value weights, and

(b) Market value weights.

How are they different? Can you think of a situation where the weighted average cost of capital would be the same using either of the weights? **(MBA – P.U. Nov. 2005)**

Solution

Computation of Weighted Average Cost of Capital

A. Book Value

Source of Funds	Amount	Cost % (X)	Weighted Cost Proportion X Cost (XW)
Debt	4,00,000	5	20,000
Preference Shares	1,00,000	8	8,000
Equity Shares	6,00,000	15	90,000
Retained Earnings	2,00,000	13	26,000
	□W = 13,00,000		□XW = 1,44,000

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$Kw = \frac{1,44,000}{13,00,000} \times 100 = 11.1\%$$

Computation Weighted Average Cost of Capital

B. Market Value

Source of Funds	Amount	Cost % (X)	Weighted Cost Proportion X Cost (XW)
Debt	3,80,000	5	19,000
Preference Shares	1,10,000	8	8,800
Equity Shares	9,00,000	15	13,500
Retained Earnings	3,00,000	13	39,000
	□W = 16,90,000		□XW = 2,01,800

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

$$Kw = \frac{2,01,800}{16,90,000} \times 100 = 11.9\%$$

Exercise 13

ABC Ltd. has the following capital structure.

	Rs.
Equity (expected dividend 12%)	10,00,000
10% preference	5,00,000
8% loan	15,00,000

You are required to calculate the weighted average cost of capital, assuming 50% as therate of income-tax, before and after tax.

Solution

Solution showing weighted average cost of capital:

Particulars	Rs.	After	Weights	Cost
Equity	10,00,000	12%	33.33%	3.99
Preference	5,00,000	10%	16.67	1.67
8% Loan	15,00,000	4%	50.00	2.00
				7.66%

Weight average cost of capital = 7.66%

MODEL QUESTIONS

1. What is cost of capital?
2. Define cost of capital.
3. Cost of capital computation based on certain assumptions. Discuss.
4. Explain the classification of cost.
5. Mention the importance of cost of capital.
6. Explain the computation of specific sources of cost of capital.
7. How over all cost of capital is calculated?
8. Explain various approaches for calculation of cost of equity.
9. Rama company issues 120000 10% debentures of Rs. 10 each at a premium of 10%. The costs of floatation are 4%. The rate of tax applicable to the companyis 55%. Complete the cost of debt capital. (**Ans.** 4.26%)
10. Siva Ltd., issues 8000 8% debentures for Rs. 100 each at a discount of 5%. The commission payable to underwriters and brokers is Rs. 40000. The debentures are redeemable after 5 years. Compute the after tax cost of debt assuming a tax rate of 60%. (**Ans.** 3.69%)
11. Bharathi Ltd., issues 4000 12% preference shares of Rs. 100 each at a discount of 5%. Costs of raising capital are Rs. 8000. Compute the cost of preference capital. (**Ans.** 12.90%)

12. Firm's tax rate at 60%. Compute the after tax cost of capital of a preferred share sold at Rs. 100 with a 8%. Dividend and a redemption price of Rs.110, if the company redeems in five years. (**Ans.** 9.52%)
13. Your company share is quoted in the market at Rs. 40 currently. The company pays a dividend of Rs. 5 per share and the investors market expects a growth rate of 7.5% per year:
    (i) Compute the company's equity cost of capital.
    (ii) If the anticipated growth rate is 10% p.a. Calculate the indicated market price per share.
    (iii) If the company's cost of capital is 15% and the anticipated growth rate is 10% p.a. Calculate the indicated market price if the dividend of Rs. 5 per share is to be maintained. (**Ans.** (i) 20%, (ii) 1/10%, (iii) 1/5%)
14. Mr. Subramanian is a shareholder in Alpha Company Ltd. Although earnings for the Alpha company have varied considerably, Subramanian has determined that long turn average dividends for the firm have been Rs. 5 per share. He expects a similar pattern to prevail in the future. Given the volatility of the Alpha's minimum rate of 40%, should it be earned on a share, what price would Subramanian be willing to pay for the Alpha is shares? (**Ans.** Rs. 12.50%)
15. A Beta Ltd., iron steel reserves are being depleted and its costs of recovering a declining quantity of iron steel are rising each year. As a equal to it the company earnings and dividends are declining at a rate of 12% p.a. If the previous year's dividend (DO) was Rs. 40 and the required rate of return is 15%. What would be the current price of the equity share of the company? (**Ans.** Rs. 95.14)
16. The following items have been extracted from the liabilities side of the balance sheet of Vivekananda company as on 31st December 2004.

Paid up capital	Rs.
2500 Equity shares of Rs. 100 each	250000
Reserve and Surplus	350000
Loans:	
10% Debentures	100000
12% Institutional Loans	300000

Other information about the company as relevant is given below:

Year ended Market Price	Dividend Per share	Earnings Per share	Average Per share
31st Dec.	(Rs.)	(Rs.)	(Rs.)
2004	7.00	11.00	80.00
2003	6.00	10.00	60.00
2002	7.00	8.00	50.00

You are required to calculate the weighted average cost of capital, using book value weights and earnings/price (E/P) ratio as the basis of cost of equity. Assume 50% tax rate.

(**Ans.** Weighted average cost of capital = 10.55%)

17. The following is an extract from the financial statements of Ramakrishna Ltd.

	(Rs. Lakhs)
Operating Profit	90
Less: Interest on Debentures	24
	66
Less: Income Tax (50%)	33
Net Profit	33
Equity share capital (share of Rs. 10)	150
Reserve and Surplus	75
10% Debentures	150
	375

The market price per equity share is 11 and per debenture Rs. 95.

(i) What is the earning per share?

(ii) What is the percentage cost of capital to the company for the equity and debentures funds?

(**Ans.** (i) Rs. 2.20, (ii) 20%)

(iii) Cost of debenture funds Book Value =

5% Market Price = 5.26%

18. Raj Ltd. is currently earning Rs. 2,00,000 and its share is selling at a market price of Rs. 160. The firm has 20,000 shares outstanding and has no debt. The earnings of the firm are expected to remain stable, and it has a payout ratio of 100%. What is the cost of equity? If the firms earns 15% rate of return on its investment opportunities then what would be the firm's cost of equity if the payout ratio is 60%?

(**Ans.** (i) When the payout ratio is 100%, 12.5%
(ii) When the payout ratio is 60%, 13.5%)

19. Kumar Industries Ltd. has assets of Rs. 80000 which have been financed with Rs. 26,000 of debt and Rs. 45,000 of equity and a general reserve of Rs. 9,000 The firm's total profit after interest and taxes for the year ended 31st March 2,000 were Rs. 6,750. It pays 10% interest on borrowed funds and is in the 60% tax bracket. It has 450 equity shares of Rs. 100 each selling at a market price of Rs. 120 per share. What is the weighted average cost of capital?

(i) EPS Rs. 15

(ii) Cost of equity 12.5%

(iii) Average cost of capital 9.74.

Chapter 7 Leverage

INTRODUCTION

Financial decision is one of the integral and important parts of financial management inany kind of business concern. A sound financial decision must consider the board coverage of the financial mix (Capital Structure), total amount of capital (capitalization) and cost of capital (K_O). Capital structure is one of the significant things for the management, since itinfluences the debt equity mix of the business concern, which affects the shareholder's return and risk. Hence, deciding the debt-equity mix plays a major role in the part of the value of the company and market value of the shares. The debt equity mix of the companycan be examined with the help of leverage.

The concept of leverage is discussed in this part. Types and effects of leverage is discussedin the part of EBIT and EPS.

Meaning of Leverage

The term leverage refers to an increased means of accomplishing some purpose. Leverage is used to lifting heavy objects, which may not be otherwise possible. In the financial point of view, leverage refers to furnish the ability to use fixed cost assets or funds to increasethe return to its shareholders.

Definition of Leverage

James Horne has defined leverage as, "the employment of an asset or fund for which the firm pays a fixed cost or fixed return.

Types of Leverage

Leverage can be classified into three major headings according to the nature of the finance mix of the company.

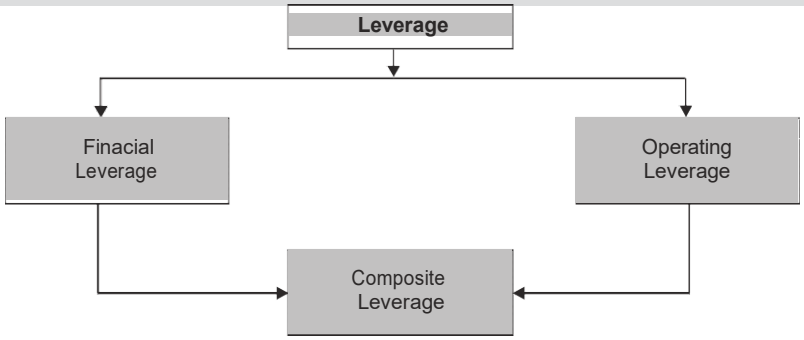


***Fig. 7.1** Types of Leverage*

The company may use finance or leverage or operating leverage, to increase the EBIT and EPS.

OPERATING LEVERAGE

The leverage associated with investment activities is called as operating leverage. It is caused due to fixed operating expenses in the company. Operating leverage may be defined as the company's ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. Operating leverage consists of two important costs viz., fixed cost and variable cost. When the company is said to have a high degree of operating leverage if it employs a great amount of fixed cost and smaller amount of variable cost. Thus, the degree of operating leverage depends upon the amount of various cost structure. Operating leverage can be determined with the help of a break even analysis.

Operating leverage can be calculated with the help of the following formula:

$$OL = \frac{C}{OP}$$

Where,

OL = Operating Leverage C = Contribution

OP = Operating Profits

Degree of Operating Leverage

The degree of operating leverage may be defined as percentage change in the profits resulting from a percentage change in the sales. It can be calculated with the help of the following formula:

$$DOL = \frac{\text{Percentage change in profits}}{\text{Percentage change in sales}}$$

Exercise 1

From the following selected operating data, determine the degree of operating leverage. Which company has the greater amount of business risk? Why?

	Company A Rs.	Company B Rs.
Sales	25,00,000	30,00,000
Fixed costs	7,50,000	15,00,000

Variable expenses as a percentage of sales are 50% for company A and 25% for company B.

Solution

Statement of Profit

	Company A Rs.	Company B Rs.
Sales	25,00,000	30,00,000
Variable cost	12,50,000	7,50,000
Contribution	12,50,000	22,50,000
Fixed cost	7,50,000	15,00,000
Operating Profit	5,00,000	7,50,000

Operating Leverage $= \frac{\text{Contribution}}{\text{Operating Profit}}$

"A" Company Leverage $= \frac{12,50,000}{5,00,000} = 2.5$

="B" Company Leverage $= \frac{2,25,000}{7,50,000} = 3$

Comments

Operating leverage for B Company is higher than that of A Company; B Company has a higher degree of operating risk. The tendency of operating profit may vary portionately with sales, is higher for B Company as compared to A Company.

Uses of Operating Leverage

Operating leverage is one of the techniques to measure the impact of changes in sales which lead for change in the profits of the company.

If any change in the sales, it will lead to corresponding changes in profit. Operating leverage helps to identify the position of fixed cost and variable cost.

Operating leverage measures the relationship between the sales and revenue of the company during a particular period.

Operating leverage helps to understand the level of fixed cost which is invested in theoperating expenses of business activities.

Operating leverage describes the over all position of the fixed operating cost.

FINANCIAL LEVERAGE

Leverage activities with financing activities is called financial leverage. Financial leverage represents the relationship between the company's earnings before interest and taxes (EBIT) or operating profit and the earning available to equity shareholders.

Financial leverage is defined as "the ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share". It involves the use of funds obtained at a fixed cost in the hope of increasing the return to the shareholders. "The use of long-term fixed interest bearing debt and preference share capital along with share capital is called financial leverage or trading on equity".

Financial leverage may be favourable or unfavourable depends upon the use of fixed cost funds.

Favourable financial leverage occurs when the company earns more on the assets purchased with the funds, then the fixed cost of their use. Hence, it is also called as positive financial leverage.

Unfavourable financial leverage occurs when the company does not earn as much as the funds cost. Hence, it is also called as negative financial leverage.

Financial leverage can be calculated with the help of the following formula:

$$FL = \frac{OP}{PBT}$$

Where,

FL = Financial leverage

OP =Operating profit (EBIT)PBT = Profit before tax.

Degree of Financial Leverage

Degree of financial leverage may be defined as the percentage change in taxable profit as a result of percentage change in earning before interest and tax (EBIT). This can be calculatedby the following formula

$$DFL = \frac{\text{Percentage change in taxable Income}}{\text{change in EBIT}}\text{Precentage}$$

Alternative Definition of Financial Leverage

According to **Gitmar**, "financial leverage is the ability of a firm to use fixed financial changesto magnify the effects of change in EBIT and EPS".

$$FL = \frac{EBIT}{EPS}$$

Where,

FL = Financial Leverage

EBIT = Earning Before Interest and Tax EPS = Earning Per share.

Exercise 2

A Company has the following capital structure.

	Rs.
Equity share capital	1,00,000
10% Prof. share capital	1,00,000
8% Debentures	1,25,000

The present EBIT is Rs. 50,000. Calculate the financial leverage assuring that thecompany is in 50% tax bracket.

Solution

Statement of Profit	Rs.
Earning Before Interest and Tax (EBIT)	50,000
(or) Operating Profit	
. Interest on Debenture 1,25,000 × 8 × 100	10,000
Earning before Tax (EBT)	40,000
Income Tax	20,000
Profit	20,000

$$\text{Financial leverage} = \frac{\text{Operating Profit (OP) Profit}}{\text{Before Tax (PBT)}}$$

$$= \frac{50,000}{40,000} = 1.25$$

Uses of Financial Leverage

Financial leverage helps to examine the relationship between EBIT and EPS.

Financial leverage measures the percentage of change in taxable income to the percentage change in EBIT.

Financial leverage locates the correct profitable financial decision regarding capital structure of the company.

Financial leverage is one of the important devices which is used to measure the fixed cost proportion with the total capital of the company.

If the firm acquires fixed cost funds at a higher cost, then the earnings from those assets, the earning per share and return on equity capital will decrease.

The impact of financial leverage can be understood with the help of the following exercise.

Exercise 3

XYZ Ltd. decides to use two financial plans and they need Rs. 50,000 for total investment.

Particulars	Plan A	Plan B
Debenture (interest at 10%)	40,000	10,000
Equity share (Rs. 10 each)	10,000	40,000
Total investment needed	50,000	50,000
Number of equity shares	4,000	1,000

The earnings before interest and tax are assumed at Rs. 5,000, and 12,500. The tax rate is 50%. Calculate the EPS.

Solution

When EBIT is Rs. 5,000

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT)	5,000	5,000
Less : Interest on debt (10%)	4,000	1,000
Earnings before tax (EBT)	1,000	4,000
Less : Tax at 50%	500	2,000
Earnings available to equity shareholders.	Rs.500	Rs.2,000
No. of equity shares	1,000	4,000
Earnings per share (EPS) Earnings/No. of equity shares	Rs. 0.50	Rs. 0.50

When EBIT is Rs. 12,500

Particulars	Plan A	Plan B
Earnings before interest and tax (EBIT).	12,500	12,500
Less: Interest on debt (10%)	4,000	1,000

(Contd. .)

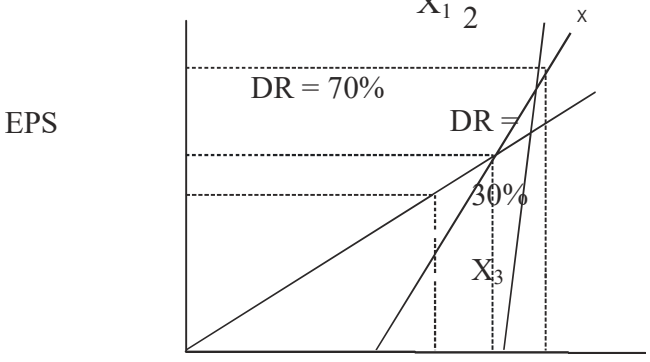
Earning before tax (EBT)	8,500	11,500
Less : Tax at 50%	4,250	5,750
Earnings available to equity shareholders	4,250	5,750
No. of equity shares	1,000	4,000
Earning per share	4.25	1.44

DISTINGUISH BETWEEN OPERATING LEVERAGE AND FINANCIAL LEVERAGE

Operating Leverage/Financial Leverage

Operating Leverage	Financial Leverage
1. Operating leverage is associated withinvestment activities of the company.	1. Financial leverage is associated with financingactivities of the company.
2. Operating leverage consists of fixed operating expenses of the company.	2. Financial leverage consists of operating profitof the company.
3. It represents the ability to use fixedoperating cost.	3. It represents the relationship between EBITand EPS.
4. Operating leverage can be calculated by $OL = \frac{C}{OP}$.	4. Financial leverage can be calculated by $FL = \frac{OP}{PBT}$.
5. A percentage change in the profits resulting from a percentage change in the sales iscalled as degree of operating leverage.	5. A percentage change in taxable profit is the result of percentage change in EBIT.
6. Trading on equity is not possible while thecompany is operating leverage.	6. Trading on equity is possible only when thecompany uses financial leverage.
7. Operating leverage depends upon fixedcost and variable cost.	7. Financial leverage depends upon theoperating profits.
8. Tax rate and interest rate will not affect theoperating leverage.	8. Financial leverage will change due to tax rateand interest rate.

EBIT - EPS Break even chart for three different financing alternatives



R = 0%

D

EBIT

C1 C2 C3

Fig. 7.2 *EBIT - EPS Break Even Chart*

Where,

DR= Debt Ratio

C_1, C_2, C_3 =Indifference Point X_1, X_2, X_3

= Financial BEP

Financial BEP

It is the level of EBIT which covers all fixed financing costs of the company. It is the level of EBIT at which EPS is zero.

Indifference Point

It is the point at which different sets of debt ratios (percentage of debt to total capital employed in the company) gives the same EPS.

COMBINED LEVERAGE

When the company uses both financial and operating leverage to magnification of any change in sales into a larger relative changes in earning per share. Combined leverage is also called as composite leverage or total leverage.

Combined leverage express the relationship between the revenue in the account of sales and the taxable income.

Combined leverage can be calculated with the help of the following formulas:

$$CL = OL \times FL$$

$$\frac{C}{OP} \times \frac{OP}{PBT} = \frac{C}{PBT}$$

Where,

CL = Combined Leverage OL = Operating Leverage FL = Financial Leverage

C = Contribution

OP = Operating Profit (EBIT) PBT = Profit Before Tax

Degree of Combined Leverage

The percentage change in a firm's earning per share (EPS) results from one percent change in sales. This is also equal to the firm's degree of operating leverage (DOL) times its degree of financial leverage (DFL) at a particular level of sales.

$$\text{Degree of contributed coverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in sales}}$$

Exercise 4

Kumar company has sales of Rs. 25,00,000. Variable cost of Rs. 12,50,000 and fixed cost of Rs. 50,000 and debt of Rs. 12,50,000 at 8% rate of interest. Calculate combined leverage.

Solution

Statement of Profit

Sales	25,00,000
Less: Variable cost	15,00,000
Contribution	10,00,000
Less: Fixed cost	5,00,000
Operating Profit	5,00,000

Combined leverage =Operating leverage×Financial leverage

Calculation of financial leverage

$$\frac{\text{Contribution}}{\text{Operating Profit}} = \frac{10,00,000}{5,00,000} = 2$$

Calculation of financial leverage

Earning before Interest and Tax (EBIT)	5,00,000
Less: Interest on Debenture (8% of 12,50,000)	1,00,000
Earnings before Tax	4,00,000

$$\text{Operating leverage} = \frac{\text{Operating Profit}}{\text{Earning Before Tax}} = \frac{5,00,000}{4,00,000} = 1.25$$

Combined leverage = 2 × 1.25 = 2.5

Exercise 5

Calculate the operating, financial and combined leverage under situations 1 and 2 and the financial plans for X and Y respectively from the following information relating to the operating and capital structure of a company, and also find out which gives the highest and the least value ? Installed capacity is 5000 units. Annual Production and sales at 60% of installed capacity.

Selling price per unit Rs. 25 Variable cost per unit Rs. 15 **Fixed cost:**

Situation 1 : Rs. 10,000
Situation 2 : Rs. 12,000

Financial Plan	X (Rs.)	Y (Rs.)
Equity	25,000	50,000
Debt (cost 10%)	50,000	25,000
	75,000	75,000

Solution

Annual production and sales 60% of 5,000 = 3000 Unit

Contribution per Unit	Rs.
Selling Price	25 Per Unit
Variable Price	15 Per Unit
	10 Per Unit Total contribution

is 3000 Units×Rs. 10=Rs. 30,000Computation of leverage.

Financial plan

	PLAN-X		PLAN-Y	
	Situation 1	**Situation 2**	**Situation 1**	**Situation 2**
Contribution	30000	30000	30000	30000
Fixed cost operating profit (or) EBIT	10000	12000	10000	12000
	20000	18000	20000	18000
Interest on Debts 10% of 50,000 10% of 25,000	5000	5000	2500	2500
Earnings before Tax	15000	13000	17500	15500
(1) Operating Leverage				
Contribution	30000	30000	30000	30000
	20000	18000	20000	18000
	= 1.5	1.67	1.5	1.67
(ii) Financial Leverage				
Operating Profit (op)	20000	18000	20000	18000
Profit Before Tax (PBI)	15000	13000	17500	15500
(iii) Combined leverage				
OL × FL =	1.5 × 1.33	1.67 × 1.38	1.5 × 1.14	1.67 × 1.16
	1.995	2.30	1.71	1.94

Highest and least value of combined leverage. Highest Value = 2.30 under situation 2 plan X.Least Value = 1.71 under situation

an Y.

Exercise 6

Calculate operating, financial and combined leverages under situations when fixed costs are:

(i) Rs. 5,000 and

(ii) Rs. 10,000 and financial plans 1 and 2 respectively from the following information pertaining to the operating and capital structure of a textile company :

	Rs.
Total Assets	30,000
Total Assets turnover	2
Variable cost as percentage of sales	60

Capital structure	**Financial Plan**	
	1	2
	Rs.	Rs.
Equity	30,000	10,000
10% debentures	10,000	30,000

Solution

Computation of Leverage Financial Plan

Plan	**1**		**2**	
Situation	**i**	**ii**	**i**	**ii**
Sales	60,000	60,000	60,000	60,000
Less : Variable cost	36,000	36,000	36,000	36,000
Contribution	24,000	24,000	24,000	24,000
Less : Fixed cost	5,000	10,000	5,000	10,000
Operating profit (EBIT)	19,000	14,000	19,000	14,000
Less : Interest	1,000	1,000	3,000	3,000
Profit before tax (PBT)	18,000	13,000	16,000	11,000
Operating leverage	24,000	24,000	24,000	24,000
Contribution	19,000	14,000	19,000	14,000
EBIT	1.26	1.71	1.26	1.71
Financial leverage	19,000	14,000	19,000	14,000
EBIT	18,000	13,000	16,000	11,000
PBT	1.05	1.07	1.18	1.27
Combined leverage	1.32	1.83	1.49	2.17

WORKING CAPITAL LEVERAGE

One of the new models of leverage is working capital leverage which is used to locate the investment in working capital or current assets in the company.

Working capital leverage measures the sensitivity of return in investment of charges in the level of current assets.

$$WCL = \frac{\text{Percentage Change in ROI}}{\text{Percentage Change is WC}}$$

If the earnings are not affected by the changes in current assets, the working capital leverage can be calculated with the help of the following formula.

$$WCL = \frac{CA}{TA - DCA}$$

Where,

CA = Current Assets TA = Total Assets

DCA = Changes in the level of Current Assets

Exercise 7

The following information is available for two companies.

	X Ltd.	**Y Ltd.**
Fixed Assets	Rs. 4,00,000	1,00,000
Current Assets	Rs. 10,00,000	4,00,000
Total Assets	Rs. 14,00,000	14,00,000
Earning before interest and taxes	Rs. 1,50,000	1,50,000

You are required to compare the sensitivity earnings of the two companies for 30% charge in the level of their current assets.

Solution

$$\text{Working capital leverage} = \frac{\text{Current Assets}}{\text{Total Assets} - \text{DCA}}$$

$$\text{X Ltd.} = \frac{1,00,000}{14,00,000 - 3,00,000}$$

$$= \frac{10,00,000}{11,00,000}$$

$$= 0.90$$

$$\text{Y Ltd.} = \frac{4,00,000}{14,00,000 - 1,20,000}$$

$$= \frac{4,00,000}{12,80,000}$$

$$= 0.3125$$

Looking at the working capital leverage of the two companies, we can say that the sensitivity of earnings for charge on the level of current assets of X Ltd. is a greater than ofY Ltd.

Exercise 8

Calculate operating leverage and financial leverage under situations A, B and C and financial plans 1, 2 and 3 respectively from the following information relating to the operating and financial leverage which give the highest value and the least value.

Installed capacity (units)	1,200
Actual production and sales (units)	800
Selling price per unit (Rs.)	15
Variable cost per unit (Rs.)	10
Fixed costs (Rs.) Situation A	1,000
Situation B	2,000
Situation C	3,000

Capital Structure	**Financial Plan**		
	1	2	3
Equity	Rs. 5,000	Rs. 7,500	Rs. 2,500
Debt	Rs. 5,000	Rs. 2,500	Rs. 7,500
Cost of debt (for all plans)	12 per cent		

(MBA – P.U. Nov. 2005)

Solution

$$DOL = \frac{S - VC}{EBIT} \quad \text{or} \quad \frac{EBIT}{S - VC}$$

	A	B	C
EBIT	4,000	4,000	4,000
S – VC	3,000	2,000	1,000
	1.33	2	4
	1	2	3

Situation A

EBIT	3,000	3,000	3,000
Less : Interest	600	300	900
EBT	2,400	2,700	2,100
Financial Leverage	1.25	1.11	1.43

Situation B

EBIT	2,000	2,000	2,000
Less : Interest	600	300	900

EBT	1,400	1,700	1,100
Financial Leverage	1.43	1.18	1.82

Situation C

EBIT	1,000	1,000	1,000
Less : Interest	600	300	900
EBT–I	400	700	100
Financial Leverage	2.5	1.43	10

Exercise 9

' XYZ' company has a choice of the following three financial plans. You are required to calculate the financial leverage in each case.

	Plan I	**Plan II**	**Plan III**
Equity capital	Rs. 2,000	Rs. 1,000	Rs. 3,000
Debt	Rs. 2,000	Rs. 3,000	Rs. 1,000
EBIT	Rs. 400	Rs. 400	Rs. 400

Interest @10% per annum on debts in all cases.

Solution

	Plan I	**Plan II**	**Plan III**
	Rs.	Rs.	Rs.
EBIT	400	400	400
Less Interest-(I)	200	300	100
EBIT –I	200	100	300
FL	2	4	1.33

MODEL QUESTIONS

1. Write a note on trading on equity.
2. What is meant by working capital leverage?
3. What is leverage? Mention different types of leverage?
4. Explain the operating leverage.
5. Discuss the concept of financial leverage.
6. How compared leverage is calculated?
7. Explain the working capital leverage.

8. What is point of indifference?
9. Distinguish the operating leverage from financial leverage.
10. Explain the uses of operating leverage.
11. From the following information find out operating, financial and combined leverages.

Sales	1,00,000
Variable Cost	60,000
Fixed Cost	20,000
Interest	10,000

(**Ans.** OL 2, FL 1.33, LL 2.67)

12. Arvind Ltd. is having the following informations. Calculate financial leverage opening leverage and combined leverage.

Sales	50,000 units Rs. 10 each
UC	Rs. 6 Per Unit
FC	Rs. 1,00,000
Interest	8 of 5,00,000

(**Ans.** FL 1.66, OL 2, CL 3.33)

13. X Ltd. is having the following capital structure. Calculate financial leverage, operating leverage and combined leverage having two situations A and B and financial plans I and II respectively.

Capacity	1,500 units
Production	1,200 units
Selling Price	Rs. 25
Variable Cost	Rs. 18
Fixed Cost Situation I	Rs. 1,400
Situation II	Rs. 2,400

Capital structure

Financial Plan

	A	B
Equity	80,000	60,000
Debt	20,000	40,000

(**Ans.** OL 1.2, 1.4, 1.2, 1.4
FL 1.16, 1.2, 1.4, 1.5
CL 1.39, 1.68, 1.68, 2.1)

14. The following details are available for the two companies.

	X Ltd.	Y Ltd.
Fixed Assets	4,00,000	6,00,000
Current Assets	6,00,000	4,00,000
Total Asset	10,00,000	10,00,000
Earnings Before Interest and Taxes	1,50,000	1,50,000

You are required to compare the sensibility of the two companies for a 30% changes in the level of current assets with the help of using capital leverages.
(**Ans.** X .73, Y 4.5)

Chapter 8 Dividend Decision

INTRODUCTION

The financial manager must take careful decisions on how the profit should be distributed among shareholders. It is very important and crucial part of the business concern, because these decisions are directly related with the value of the business concern and shareholder'swealth. Like financing decision and investment decision, dividend decision is also a major part of the financial manager. When the business concerns decide dividend policy, they have to consider certain factors such as retained earnings and the nature of shareholder of the business concern.

Meaning of Dividend

Dividend refers to the business concerns net profits distributed among the shareholders. It may also be termed as the part of the profit of a business concern, which is distributed among its shareholders.

According to the **Institute of Chartered Accountant of India**, dividend is defined as "a distribution to shareholders out of profits or reserves available for this purpose".

TYPES OF DIVIDEND/ FORM OF DIVIDEND

Dividend may be distributed among the shareholders in the form of cash or stock. Hence,Dividends are classified into:

A. Cash dividend
B. Stock dividend
C. Bond dividend
D. Property dividend

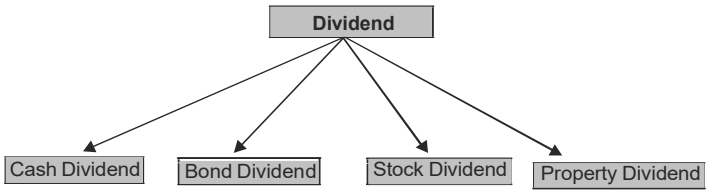


***Fig. 8.1** Types of Dividend*

Cash Dividend

If the dividend is paid in the form of cash to the shareholders, it is called cash dividend. It is paid periodically out the business concerns EAIT (Earnings after interest and tax). Cash dividends are common and popular types followed by majority of the business concerns.

Stock Dividend

Stock dividend is paid in the form of the company stock due to raising of more finance. Under this type, cash is retained by the business concern. Stock dividend may be bonus issue. This issue is given only to the existing shareholders of the business concern.

Bond Dividend

Bond dividend is also known as script dividend. If the company does not have sufficient funds to pay cash dividend, the company promises to pay the shareholder at a future specific date with the help of issue of bond or notes.

Property Dividend

Property dividends are paid in the form of some assets other than cash. It will distributed under the exceptional circumstance. This type of dividend is not published in India.

DIVIDEND DECISION

Dividend decision of the business concern is one of the crucial parts of the financial manager, because it determines the amount of profit to be distributed among shareholders and amount of profit to be treated as retained earnings for financing its long term growth. Hence, dividend decision plays very important part in the financial management.

Dividend decision consists of two important concepts which are based on the relationship between dividend decision and value of the firm.

Dividend Theories

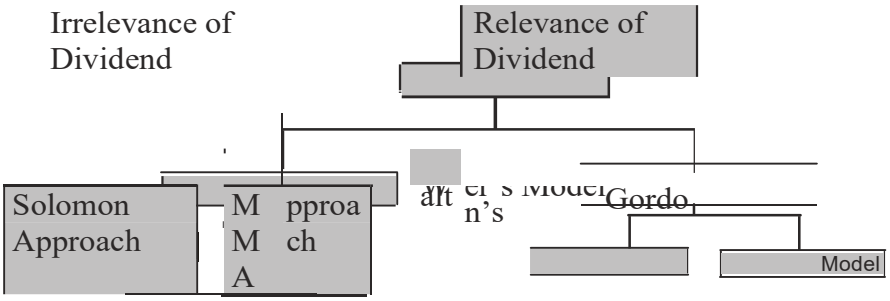


Fig. 8.2 *Dividend Theories*

Irrelevance of Dividend

According to professors **Soloman, Modigliani and Miller**, dividend policy has no effect on the share price of the company. There is no relation between the dividend rate and value of the firm. Dividend decision is irrelevant of the value of the firm. Modigliani and Miller contributed a major approach to prove the irrelevance dividend concept.

Modigliani and Miller's Approach

According to MM, under a perfect market condition, the dividend policy of the company is irrelevant and it does not affect the value of the firm.

"Under conditions of perfect market, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of shares".

Assumptions

MM approach is based on the following important assumptions:

1. Perfect capital market.
2. Investors are rational.
3. There are no tax.
4. The firm has fixed investment policy.
5. No risk or uncertainty.

Proof for MM approach

MM approach can be proved with the help of the following formula:

$$P_o = \frac{D_1 + P_1}{(1 + K_e)}$$

Where,

P_o = Prevailing market price of a share. K_e = Cost of equity capital.

D_1 = Dividend to be received at the end of period one. P_1 = Market price of the share at the end of period one.

P1 can be calculated with the help of the following formula.

$$P1 = Po\ (1+Ke) - D1$$

The number of new shares to be issued can be determined by the following formula: $M \times P1 = I - (X - nD1)$

Where,

M = Number of new share to be issued. P1 = Price at which new issue is to be made.

I = Amount of investment required.

X = Total net profit of the firm during the period. nD1 = Total dividend paid during the period.

Exercise 1

X Company Ltd., has 100000 shares outstanding the current market price of the shares Rs. 15 each. The company expects the net profit of Rs. 2,00,000 during the year and it belongs to a rich class for which the appropriate capitalisation rate has been estimated to be 20%. The company is considering dividend of Rs. 2.50 per share for the current year.

What will be the price of the share at the end of the year (i) if the dividend is paid and (ii) if the dividend is not paid.

Solution

$$P_o = \frac{D_1 + P_1}{(1 + W_e)}$$

(i) If the dividend is paid

$$Po = Rs.15 \quad Ke = 20\%$$

$$D1 = 2.50 \quad P1 = ?$$

$$15 = \frac{Z.50 + P1}{1 + Z0\%}$$

$$15 = \frac{Z.50 + P1}{1.Z}$$

$$2.50 + P1 = 15 \times 1.2$$

$$P1 = 18 - 2.50 \quad P1 = Rs.\ 15.50$$

(ii) If the dividend is not paid

$$Po = 15$$

$$Ke = 20\%$$

$$D1 = 0$$

$P_1 = ?$

$$15 = \frac{0 + P_1}{1 + 20\%}$$

$$15 = \frac{0 + P_1}{1.20}$$

$$0 + P_1 = 15 \times 1.20 \quad P_1 = \text{Rs. } 18.$$

Exercise 2

Ram company belongs to a risk class for which the appropriate capitalization rate is 12%. It currently has outstanding 30000 shares selling at Rs. 100 each. The firm is contemplating the declaration of dividend of Rs. 6 per share at the end of the current financial year. The company expects to have a net income of Rs. 3,00,000 and a proposal for making new investments of Rs. 6,00,000. Show that under the MM assumptions, the payment of dividend does not affect the value of the firm. How many new shares issuedand what is the market value at the end of the year?

Solution

$$P_o = \frac{D_1 + P_1}{1 + K_e}$$

$P_o = 100 \quad D_1 = \text{Rs. } 6 \quad P_1 = ?$

$K_e = 12\%$

$$100 = \frac{6 + P_1}{1 + 12\%}$$

$$100 = \frac{6 + P_1}{1.12}$$

$$6 + P_1 = 112$$

$$P_1 = 112 - 6 \quad P_1 = \text{Rs. } 106$$

Dividend is not declared

$K_e = 12\%, \; P_o = 100, \; D_1 = 0, \; P_1 = ?$

$$100 = \frac{0 + P_1}{1 + 12\%}$$

$$100 = \frac{0 + P_1}{1.12}$$

$$P_1 = \text{Rs. } 112$$

Calculation of number of new shares to be issued

	Dividends Paid	Dividends not Paid
Net Income	300000	300000
Total Dividends	180000	–
Retained Earnings	120000	300000
Investment Budget	600000	600000
Amount to be raised as new shares (Investment – Retained Earnings)	480000	300000
Relevant – Market Price per share	Rs. 106	Rs. 112
No. of new shares to be issued	4528.3	2678.6
Total number of shares at the end of the year	300000	30000
Existing shares	4528.3	2678.6
(+) new shares issued	34528.3	32678.6
Market price per share	**Rs. 106**	**112**
Market value for shares	**Rs. 3660000**	**3660000**

There is no change in the total market value of shares whether dividends are distributed or not distributed.

Exercise 3

ABC Ltd. has a capital of Rs. 10,00,000 in equity shares of Rs. 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs. 10 per share at the end of the current financial year. The capitalization rate for the risk class to which the company belongs is 12%.

What will be the MP of the share at the end of the year, if

(i) A dividend is not declared.

(ii) A dividend is declared.

(iii) Assuming that the company pays the dividend and has net profits of Rs. 5,00,000 and makes new investments of Rs. 10,00,000 during the period, how many new shares must be issued? Use the MM Model. **(C.A Final Nov. 1990)**

Solution

As per MM Model, the current MP of the share is

$$P_O = \frac{D_1 + P_1}{1 + W_e}$$

(i) If the dividend is not declared

$$100 = \frac{0 + P_1}{(1 + .1Z)}$$

$$100 = \frac{P1}{Z}$$

$$P1 = \text{Rs. } 112$$

(ii) If the dividend is declared

$$100 = \frac{10 + P_1}{1 + 0.1Z}$$

$$100 = \frac{10 + P_1}{1.1Z}$$

$$112 = 10 + P1$$

$$P1 = 112 - 10P1 = \text{Rs. } 102$$

(iii) In case the firm which pays dividend of Rs. 10 per share, then the number ofnew shares to be issued is M.

$$M \times P1 = I - (X - nD1)$$

$$M \times 102 = 10,00,000 - (5,00,000 - 10,000 \times 10)$$

$$102\ m = 10,00,000 - 4,00,000$$

$$M = \frac{6,00,000}{10Z}$$

$$= 5882.35 \text{ (or) } 5883$$

The firm should issue 5883 new shares @ Rs. 102 per share to finance its investmentproposals.

Exercise 4

Z Ltd., has risk allying firm for which capitalization rate is 12%. It currently has outstanding 8,000 shares selling at Rs. 100 each. The dividend for the current financial year is Rs. 7 per share. The company expects to have a net income of Rs. 69,000 and has a proposal formatting new investments of Rs. 1,60,000. Show that under the MM hypothesis the payment of dividend does not affect the value of the firm.

(a) Value of the firm when dividends are paid. Price of the shares at the end of the current financial year.

$$P1 = Po\ (1+Ke) - D1$$

$$= 100\ (1 + .12) - 7$$

$$= 100 \times 1.12 - 7$$

$$P1 = \text{Rs. } 105$$

(b) Number of shares to be issued.

$$S = \frac{I - (TE - nD)}{P_1}$$

$$= \frac{1,60,000 - (66000 - (8000 \times f))105}{1,60,000 - (13000)}$$

$$= \frac{105}{1,4f,000}$$

$$= 1400 \text{ shares}$$

The MM hypothesis explained in another firm also assumes that investment required by the firm on account of payment of dividends is finance out of the new issue of equity shares.

$$S = \frac{I - (TE - nD)}{W_1}$$

S = Value of the firm can be calculated as follows.

$$nP_o = \frac{(k + S)\, W_1 - (1 - TE)}{1 + W_e}$$

nP_o = Value of the firm TE = Total Earnings

M_1 = Market Price at the end of the period K_e = Cost of capital

D = Dividend paid at the end of the year (or) period N = Number of shares outstanding at the beginning of the period.

$$nP_o = \frac{(k + S)\, W_1 - (1 - TE)}{1 + W_e}$$

$$= \frac{8000 + 1400 \times 105 - (1,60,000 - 66,000)1+1Z\%}{6400 \times 105 - 61000}$$

$$= \frac{}{1.1Z}$$

$$= 8,00,000$$

Criticism of MM approach

MM approach consists of certain criticisms also. The following are the major criticisms of MM approach.

MM approach assumes that tax does not exist. It is not applicable in the practical life of the firm.

MM approach assumes that, there is no risk and uncertain of the investment. It is also not applicable in present day business life.

MM approach does not consider floatation cost and transaction cost. It leads to affect the value of the firm.

MM approach considers only single decrement rate, it does not exist in real practice.

MM approach assumes that, investor behaves rationally. But we cannot give assurance that all the investors will behave rationally.

RELEVANCE OF DIVIDEND

According to this concept, dividend policy is considered to affect the value of the firm. Dividend relevance implies that shareholders prefer current dividend and there is no direct relationship between dividend policy and value of the firm. Relevance of dividend concept is supported by two eminent persons like Walter and Gordon.

Walter's Model

Prof. James E. Walter argues that the dividend policy almost always affects the value of the firm.

Walter model is based in the relationship between the following important factors:

- Rate of return I
- Cost of capital (k)

According to the Walter's model, if r > k, the firm is able to earn more than what the shareholders could by reinvesting, if the earnings are paid to them. The implication of r > k is that the shareholders can earn a higher return by investing elsewhere.

If the firm has r = k, it is a matter of indifferent whether earnings are retained or distributed.

Assumptions

Walters model is based on the following important assumptions:

1. The firm uses only internal finance.
2. The firm does not use debt or equity finance.
3. The firm has constant return and cost of capital.
4. The firm has 100 recent payout.
5. The firm has constant EPS and dividend.
6. The firm has a very long life.

Walter has evolved a mathematical formula for determining the value of market share.

$$P = \frac{D + \frac{r}{W_e}(E - D)}{W_e}$$

Where,

P = Market price of an equity share D = Dividend per share

r = Internal rate of return E = Earning per share

K_e = Cost of equity capital

Exercise 5

From the following information supplied to you, ascertain whether the firm is following an optional dividend policy as per Walter's Model?

Total Earnings	Rs. 2,00,000
No. of equity shares (of Rs. 100 each 20,000)	
Dividend paid	Rs. 1,00,000
P/E Ratio	10
Return Investment	15%

The firm is expected to maintain its rate on return on fresh investments. Also find out what should be the E/P ratio at which the dividend policy will have no effect on the value of the share? Will your decision change if the P/E ratio is 7.25 and interest of 10%?

Solution

$$EPS = \frac{\text{Earnings}}{\text{ko. of Skares}} = \frac{Z00000}{Z0000} = \text{Rs. } 10$$

$$\text{P/E Ratio} = 10$$

$$K_e = \frac{1}{\text{P/E Ratio}} = \frac{1}{10} = 0.10$$

$$DPS = \frac{\text{Total Dividends paid}}{\text{ko. of Skares}} = \frac{100000}{Z0000} = \text{Rs. } 5$$

The value of the share as per Walter's Model is

$$P = \frac{D + r/ke(E - D)}{W_e}$$

$$= \frac{5 + .15/.10\,(10 - 5)}{0.10}$$

$$= \frac{5 + 1.5}{0.10}$$

$$= \text{Rs. } 12.5$$

$$\text{Dividend Payout} = \frac{\text{DPS}}{\text{EPS}} \times 100$$

$$= \frac{5}{10} \times 100 = 60\%$$

r >Ke therefore by distributing 60% of earnings, the firm is not following an optional dividend policy. In this case, the optional dividend policy for the firm would be to pay zero dividend and the Market Price would be:

$$P = \frac{5+.15/.10\ (10-0)}{.10}$$

$$= \frac{5 + 15}{.10}$$

$$= \frac{20}{.10}$$

$$P = \text{Rs. } 200$$

So, the MP of the share can be increased by following a zero payout, of the P/E is 7.25 instead of 10 then the Ke =1=0.138 and in this case Ke>r and the MP of the share is 7.25.

$$P = \frac{5 + \frac{.15}{.138}\ (10-5)}{.138}$$

$$= 5 + 5.435$$

$$\boxed{P = \text{Rs. } 5.62}$$

Exercise 6

The earnings per share of a company are Rs. 80 and the rate of capitalization applicable to the company is 12%. The company has before it an option of adopting a payment ratio of 25% (or) 50%(or) 75%. Using Walter's formula of dividend payout, compute the market value of the company's share of the productivity of retained earnings (i) 12% (ii) 8%
(iii) 5%.

Solution

$$E = 10 \text{ and } Ke = 12\% = 0.12$$

As per Walter's Model, the market price of a share is

$$P = \frac{D + \frac{r}{W_e}(E - D)}{W_e}$$

(A) If payout ratio is 25%

(i) r=12%=0.12, D=25%of 10=Rs. 2.50

$$P = \frac{Z.5 + \frac{.1Z}{.1Z}(10 - Z.50)}{.1Z}$$

$$= \frac{Z.50 + f.50}{Z}$$

$$= \frac{}{10} \quad \frac{}{0.1Z}$$

$$= \text{Rs. } 83.33$$

R = 8% = 0.08

R = 8% = 0.08, D = 25% of 10 = Rs. 2.50

$$Z.50 \; \square \; \frac{0.08}{0.1Z}(10 \; \square \; Z.50)$$

$$Z.50 + 5$$

$$= \frac{}{0.1Z}$$

$$= \frac{f.50}{0.1Z} = \text{Rs. } 62.5$$

Exercise 7

From the following data, calculate the MP of a share of ABC Ltd., under (i) Walter's formula; and (ii) Dividend growth model.

EPS = Rs. 10 DPS = Rs. 6

Ke = 18% r = 25%

retention ratio (b) = 45%

Solution:

(i) Walter's Model

$$P = \frac{D + r\,(EPS - DPS)}{W_e}$$

$$\square \; \frac{6 + .Z5\,(10-6)}{.18}$$

$$= \frac{6 + 5.56}{.18}$$

$$= \frac{11.56}{.18}$$

$$= \text{Rs. } 64.22$$

(ii) Dividend Growth Model

$$P = \frac{E(1-b)}{W_e - br}$$

$$= \frac{10(1-.45)}{.18 - (.45 \times .Z5)}$$

$$= \frac{10 \times .55}{.18 - 0.11Z5}$$

$$= \frac{5.5}{0.06f5}$$

$$= \text{Rs. } 81.48$$

Criticism of Walter's Model

The following are some of the important criticisms against Walter model:

Walter model assumes that there is no extracted finance used by the firm. It is notpractically applicable.

There is no possibility of constant return. Return may increase or decrease, dependingupon the business situation. Hence, it is applicable.

According to Walter model, it is based on constant cost of capital. But it is not applicablein the real life of the business.

Gordon's Model

Myron Gorden suggest one of the popular model which assume that dividend policy of afirm affects its value, and it is based on the following important assumptions:

1. The firm is an all equity firm.
2. The firm has no external finance.
3. Cost of capital and return are constant.
4. The firm has perpectual life.
5. There are no taxes.
6. Constant relation ratio (g=br).
7. Cost of capital is greater than growth rate (K_e>br).

Gordon's model can be proved with the help of the following formula:

$$P = \frac{E(1-b)}{W_e - br}$$

Where,

P = Price of a share
E = Earnings per share
1 – b = D/p ratio (i.e., percentage of earnings distributed as dividends)
Ke = Capitalization rate
br = Growth rate = rate of return on investment of an all equity firm.

Exercise 8

Raja company earns a rate of 12% on its total investment of Rs. 6,00,000 in assets. It has 6,00,000 outstanding common shares at Rs. 10 per share. Discount rate of the firm is 10% and it has a policy of retaining 40% of the earnings. Determine the price of its share using Gordon's Model. What shall happen to the price of the share if the company has payout of 60% (or) 20%?

Solution

According to Gordon's Model, the price of a share is

$$P = \frac{E(1-b)}{W_e - br}$$

Given: E = 12% of Rs. 10=Rs. 1.20r = 12%=0.12
K =10%=0.10
t =10%=0.10
b = 40%=0.40

Put the values in formula

$$P = \frac{1.Z0\ (1 - .40)}{10 - (.40 \times .1Z)}$$

$$\frac{1.Z0 \times (0.60)}{.10 - 0.048}$$

$$= \frac{0.fZ\ 0.05Z}{}$$

= Rs. 13.85

If the firm follows a policy of 60% payout then b=20% =0.20 The price is

$$P = \frac{1.Z0\,(1\times 0.Z0)}{.10 - (.Z\times .1Z)}$$

$$= 0.05$$

r=4% =0.04, D =25% of 10=2.50

$$Z = Z.50 + \frac{\frac{0.04}{0.1Z}(10 - Z.50)}{\frac{0.1Z}{}}$$

$$= \frac{5}{0.1Z} = \text{Rs. } 41.67$$

If payout ratio is 50%, D=50% of 10=Rs. 5r=12%=0.12,

D=50% of 10 = Rs. 5

$$= 5 + \frac{\frac{0.1Z}{0.1Z}(10 - 5)}{\frac{0.1Z}{}}$$

$$= 5 + 5 \frac{\frac{0.1}{Z}}{10} = \text{Rs. } 83.33$$

$$= \frac{}{0.1Z}$$

r = 8% = 0.08, D = 50% of 10 = 5

$$= \frac{5 \square \frac{0.8}{0.1Z}(10-5)}{0.1Z}$$

$$= \frac{5+3.33}{0.1Z}$$

$$= \frac{8.33}{0.1Z} = \text{Rs. } 69.42$$

r = 4% = 0.04, D = 50% of 10

= 5

$$= 5 + \frac{0.04}{0.1Z}(10 - 5)$$

$$= \frac{5+1.6f}{0.1Z}$$

$$= = \text{Rs. } 55.58$$

$$\frac{6.6f}{0.1Z}$$

C. If payout ratio is 75%

D = 75% of 10 = 7.50

(i) r = 12% = 0.12, D = 75% of 10 = 7.50

$$P = \frac{7.50 + 0.08(10 - 7.50)}{0.12 - 0.08}$$

$$= \frac{7.50 + 2.50}{0.04} = \text{Rs. } 250.00$$

(ii) r = 8% = 0.8, D = 75% of 10 = 7.50

$$P = \frac{7.50 + 0.08(10 - 7.50)}{0.12 - 0.08}$$

$$= \frac{7.50 + 1.60}{0.04}$$

$$= \frac{9.10}{0.04} = \text{Rs. } 227.50$$

(iii) r = 4% = 0.04, D = 75% of 10 = 7.50

$$P = \frac{7.50 + 0.04(10 - 7.50)}{0.12 - 0.04}$$

$$= \frac{7.50 + 0.83}{0.08}$$

$$= \frac{8.33}{0.04} = \text{Rs. } 208.25$$

$$= \frac{1.20 + 0.80}{.10 - 0.04}$$

$$= \frac{0.66}{0.06} = \text{Rs. } 110.63$$

If the payout is 20% the value of b=0.60 and the price of the share is

$$= \frac{1.20 (1 - 0.60)}{.10 - (.80 \times .12)}$$

$$= \frac{1.20 \times 0.40}{.10 - 0.096}$$

$$= \frac{0.48}{0.004} = \text{Rs. } 120$$

Criticism of Gordon's Model

Gordon's model consists of the following important criticisms:

Gordon model assumes that there is no debt and equity finance used by the firm. It isnot applicable to present day business.

Ke and r cannot be constant in the real practice.

According to Gordon's model, there are no tax paid by the firm. It is not practically applicable.

FACTORS DETERMINING DIVIDEND POLICY

Profitable Position of the Firm

Dividend decision depends on the profitable position of the business concern. When the firm earns more profit, they can distribute more dividends to the shareholders.

Uncertainty of Future Income

Future income is a very important factor, which affects the dividend policy. When the shareholder needs regular income, the firm should maintain regular dividend policy.

Legal Constrains

The Companies Act 1956 has put several restrictions regarding payments and declaration of dividends. Similarly, Income Tax Act, 1961 also lays down certain restrictions on paymentof dividends.

Liquidity Position

Liquidity position of the firms leads to easy payments of dividend. If the firms have high liquidity, the firms can provide cash dividend otherwise, they have to pay stock dividend.

Sources of Finance

If the firm has finance sources, it will be easy to mobilise large finance. The firm shall not go for retained earnings.

Growth Rate of the Firm

High growth rate implies that the firm can distribute more dividend to its shareholders.

Tax Policy

Tax policy of the government also affects the dividend policy of the firm. When the government gives tax incentives, the company pays more dividend.

Capital Market Conditions

Due to the capital market conditions, dividend policy may be affected. If the capital market is prefect, it leads to improve the higher dividend.

TYPES OF DIVIDEND POLICY

Dividend policy depends upon the nature of the firm, type of shareholder and profitable position. On the basis of the dividend declaration by the firm, the dividend policy may be classified under the following types:

- Regular dividend policy
- Stable dividend policy
- Irregular dividend policy
- No dividend policy.

Regular Dividend Policy

Dividend payable at the usual rate is called as regular dividend policy. This type of policy is suitable to the small investors, retired persons and others.

Stable Dividend Policy

Stable dividend policy means payment of certain minimum amount of dividend regularly. This dividend policy consists of the following three important forms:

Constant dividend per shareConstant payout ratio

Stable rupee dividend plus extra dividend.

Irregular Dividend Policy

When the companies are facing constraints of earnings and unsuccessful business operation, they may follow irregular dividend policy. It is one of the temporary arrangements to meet the financial problems. These types are having adequate profit. For others no dividend is distributed.

No Dividend Policy

Sometimes the company may follow no dividend policy because of its unfavourable workingcapital position of the amount required for future growth of the concerns.

MODEL QUESTIONS

1. What is dividend? Explain the types of dividend.
2. Explain the approaches of dividend decision.
3. Explain the factors affecting the dividend policy.
4. Discuss the various types of dividend policy.
5. Explain the irrelevance and relevance dividend theories.
6. State the criticism of MM approach.
7. What are the assumptions of Walter's model?

8. What are the assumptions and criticisms of Gordon's model?
9. U Ltd. belongs to risk class of capitalization rate which is 14%. It has currently 3000 shares outstanding at Rs. 50 each; during the year Rs. 5 is declared as dividend. The net income of the company is Rs. 83,000. For the new project investment is required of Rs. 1,20,000. Calculate under MM hypothesis that the payment of dividend does not affect the value of the firm.
   (**Ans.** dividend paid Rs. 52 number of equity shares 1000 and value of the firm Rs. 1,50,000. Dividend not paid Rs. 57. Number of equity shares 37000/57 shares (approx. 650 shares) Value of the firm is Rs. 1,50,000)
10. X Ltd., had 25,000 equity shares of Rs. 100 each outstanding on 1st April, the shares are issued at par in the market, the company removed restraint in the dividend policy, the company ready to pay dividend of Rs. 15 per share for the current calendar year. The capitalization rate is 15%. Using MM approach assuming that no taxes, calculate the price of the shares at the end of the year:
    (a) When dividend is not declared.
    (b) When dividend is declared.
    (c) Find out the number of new shares that the company issues to meet its investment needs of Rs 15,00,000 assuming that net income of Rs. 7,50,000 and assuming that the dividend is paid.

    (**Ans.** (a) Rs.105 (b) Rs.115 (c) 10,000 shares)
11. The following information is available in respect of a companys capitalization rate is 15% earnings per share Rs. 75. Assured rate on investment is 14% , 12%, 10%. The effect of dividend policy on market price of shares applying Walter's model the dividend payout ratio is (a) 0% (b) 40% (c) 60% (d) 100%)
12. The following data are available for R Ltd.
    — Earnings per share Rs. 8
    — Rate of return on investment 16%
    — Rate of return to shareholders 12%

    If Gordon's basic valuation formula is applied what will be the price per share when the dividend pay out ratio is 25%, 50%, 60% and 100%.

    (**Ans.** Rs. 0, 100, 85.71, and 66.67)

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Chapter

9

Capital Budgeting

INTRODUCTION

The word Capital refers to be the total investment of a company of firm in money, tangible and intangible assets. Whereas budgeting defined by the "**Rowland** and **William**" it may be said to be the art of building budgets. Budgets are a blue print of a plan and action expressed in quantities and manners.

The examples of capital expenditure:

1. Purchase of fixed assets such as land and building, plant and machinery, good will, etc.
2. The expenditure relating to addition, expansion, improvement and alteration tothe fixed assets.
3. The replacement of fixed assets.
4. Research and development project.

Definitions

According to the definition of **Charles T. Hrongreen,** "capital budgeting is a long-term planning for making and financing proposed capital out lays.

According to the definition of **G.C. Philippatos,** "capital budgeting is concerned with the allocation of the firms source financial resources among the available opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent streams of expenditure".

According to the definition of **Richard and Green law,** "capital budgeting is acquiring inputs with long-term return".

According to the definition of **Lyrich,** "capital budgeting consists in planning development of available capital for the purpose of maximizing the long-term profitability of the concern".

It is clearly explained in the above definitions that a firm's scarce financial resources utilizing the available opportunities. The overall objectives of the company from is to maximize the profits and minimize the expenditure of cost.

Need and Importance of Capital Budgeting

1. **Huge investments:** Capital budgeting requires huge investments of funds, but the available funds are limited, therefore the firm before investing projects, plan are control its capital expenditure.
2. **Long-term:** Capital expenditure is long-term in nature or permanent in nature. Therefore financial risks involved in the investment decision are more. If higher risks are involved, it needs careful planning of capital budgeting.
3. **Irreversible:** The capital investment decisions are irreversible, are not changed back. Once the decision is taken for purchasing a permanent asset, it is very difficult to dispose off those assets without involving huge losses.
4. **Long-term effect:** Capital budgeting not only reduces the cost but also increases the revenue in long-term and will bring significant changes in the profit of the company by avoiding over or more investment or under investment. Over investments leads to be unable to utilize assets or over utilization of fixed assets. Therefore before making the investment, it is required carefully planning and analysis of the project thoroughly.

CAPITAL BUDGETING PROCESS

Capital budgeting is a difficult process to the investment of available funds. The benefit will attained only in the near future but, the future is uncertain. However, the following steps followed for capital budgeting, then the process may be easier are.

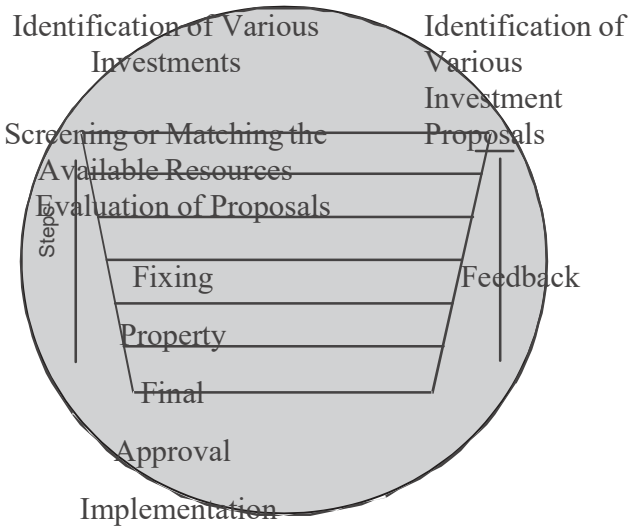

Fig. 9.1 *Capital Budgeting Process*

1. **Identification of various investments proposals:** The capital budgeting may have various investment proposals. The proposal for the investment opportunities may be defined from the top management or may be even from the lower rank. The heads of various department analyse the various investment decisions, and will select proposals submitted to the planning committee of competent authority.
2. **Screening or matching the proposals:** The planning committee will analyse the various proposals and screenings. The selected proposals are considered with the available resources of the concern. Here resources referred as the financial part of the proposal. This reduces the gap between the resources and the investment cost.
3. **Evaluation:** After screening, the proposals are evaluated with the help of various methods, such as pay back period proposal, net discovered present value method, accounting rate of return and risk analysis. Each method of evaluation used in detail in the later part of this chapter. The proposals are evaluated by.
   (a) Independent proposals
   (b) Contingent of dependent proposals
   (c) Partially exclusive proposals.

   Independent proposals are not compared with another proposals and the same may be accepted or rejected. Whereas higher proposals acceptance depends upon the other one or more proposals. For example, the expansion of plant machinery leads to constructing of new building, additional manpower etc. Mutually exclusive projects are those which competed with other proposals and to implement the proposals after considering the risk and return, market demand etc.
4. **Fixing property:** After the evolution, the planning committee will predict which proposals will give more profit or economic consideration. If the projects or proposals are not suitable for the concern's financial condition, the projects are rejected without considering other nature of the proposals.
5. **Final approval:** The planning committee approves the final proposals, with the help of the following:
   (a) Profitability
   (b) Economic constituents
   (c) Financial violability
   (d) Market conditions.

   The planning committee prepares the cost estimation and submits to themanagement.
6. **Implementing:** The competent autherity spends the money and implements the proposals. While implementing the proposals, assign responsibilities to the proposals, assign responsibilities for completing it, within the time allotted and reduce the cost for this purpose. The network techniques used such as PERT and CPM. It helps the management for monitoring and containing the implementation of the proposals.

7. **Performance review of feedback:** The final stage of capital budgeting is actual results compared with the standard results. The adverse or unfavourable results identified and removing the various difficulties of the project. This is helpful for the future of the proposals.

KINDS OF CAPITAL BUDGETING DECISIONS

The overall objective of capital budgeting is to maximize the profitability. If a firm concentrates return on investment, this objective can be achieved either by increasing the revenues or reducing the costs. The increasing revenues can be achieved by expansion or the size of operations by adding a new product line. Reducing costs mean representing obsolete return on assets.

METHODS OF CAPITAL BUDGETING OF EVALUATION

By matching the available resources and projects it can be invested. The funds available are always living funds. There are many considerations taken for investment decision process such as environment and economic conditions.

The methods of evaluations are classified as follows:

(A) Traditional methods (or Non-discount methods)

(i) Pay-back Period Methods
(ii) Post Pay-back Methods
(iii) Accounts Rate of Return

(B) Modern methods (or Discount methods)

(i) Net Present Value Method
(ii) Internal Rate of Return Method
(iii) Profitability Index Method

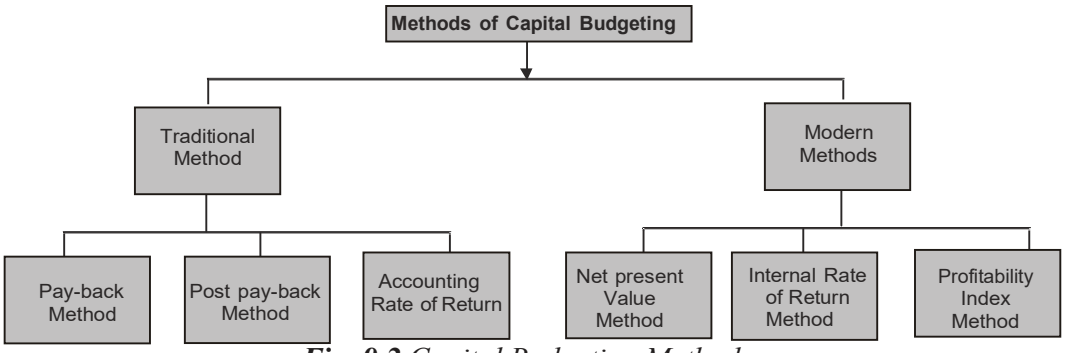

***Fig. 9.2** Capital Budgeting Methods*

Pay-back Period

Pay-back period is the time required to recover the initial investment in a project.

(It is one of the undiscounted cash flow methods of capital budgeting).

$$= \frac{\text{Initial investment}}{\text{Annual cash inflows}} \text{ Pay-back period}$$

Merits of Pay-back method

The following are the important merits of the pay-back method:

1. It is easy to calculate and simple to understand.
2. Pay-back method provides further improvement over the accounting rate return.
3. Pay-back method reduces the possibility of loss on account of obsolescence.

Demerits

1. It ignores the time value of money.
2. It ignores all cash inflows after the pay-back period.
3. It is one of the misleading evaluations of capital budgeting.

Accept /Reject criteria

If the actual pay-back period is less than the predetermined pay-back period, the projectwould be accepted. If not, it would be rejected.

Exercise 1

Project cost is Rs. 30,000 and the cash inflows are Rs. 10,000, the life of the project is5 years. Calculate the pay-back period.

Solution

$$= \frac{\text{Rs. } 30{,}000}{\text{Rs. } 10{,}000} = 3 \text{ Years}$$

The annual cash inflow is calculated by considering the amount of net income on the amount of depreciation project (Asset) before taxation but after taxation. The income precision earned is expressed as a percentage of initial investment, is called unadjusted rate of return. The above problem will be calculated as below:

$$\text{Unadjusted rate of return} = \frac{\text{Annual Return}}{\text{Investment}} \times 100$$

$$= \frac{\text{Rs. } 10{,}000}{\text{Rs. } 30{,}000} \times 100$$

$$= 33.33\%$$

Exercise 2

A project costs Rs. 20,00,000 and yields annually a profit of Rs. 3,00,000 afterdepreciation @ 12½% but before tax at 50%. Calculate the pay-back period.

Profit after depreciation	3,00,000
	1,50,000
Tax 50%	1,50,000
Add depreciation	
20,00,000 12 1/2 %	2,50,000
Cash in flow	4,00,000

Solution

$$\text{Pay-back period} = \frac{\text{Investment}}{\text{Cash flow}}$$

$$= \frac{20,00,000}{4,00,000} = 5 \text{ years.}$$

Uneven Cash Inflows

Normally the projects are not having uniform cash inflows. In those cases the pay-back period is calculated, cumulative cash inflows will be calculated and then interpreted.

Exercise 3

Certain projects require an initial cash outflow of Rs. 25,000. The cash inflows for 6 years are Rs. 5,000, Rs. 8,000, Rs. 10,000, Rs. 12,000, Rs. 7,000 and Rs. 3,000.

Solution

Year	Cash Inflows (Rs.)	Cumulative Cash Inflows(Rs.)
1	5,000	5,000
2	8,000	13,000
3	10,000	23,000
4	12,000	35,000
5	7,000	42,000
6	3,000	45,000

The above calculation shows that in 3 years Rs. 23,000 has been recovered Rs. 2,000, is balance out of cash outflow. In the 4th year the cash inflow is Rs. 12,000. It means the pay- back period is three to four years, calculated as follows

$$\text{Pay-back period} = 3 \text{ years} + 2000/12000 \times 12 \text{ months}$$

$$= 3 \text{ years } 2 \text{ months.}$$

Post Pay-back Profitability Method

One of the major limitations of pay-back period method is that it does not consider the cash inflows earned after pay-back period and if the real profitability of the project cannot be assessed. To improve over this method, it can be made by considering the receivable after the pay-back period. These returns are called post pay-back profits.

Exercise 4

From the following particulars, compute:

1. Payback period.
2. Post pay-back profitability and post pay-back profitability index.

(a) Cash outflow Rs. 1,00,000 Annual cash inflow Rs. 25,000 (After tax before depreciation)
Estimate Life 6 years

(b) Cash outflow Rs. 1,00,000 Annual cash inflow
(After tax depreciation)
First five years Rs. 20,000
Next five years Rs. 8,000
Estimated life 10 Years
Salvage value Rs. 16,000

Solution

(a) (i) Pay-back period

$$= \frac{\text{Initial investment}}{\text{Annual cash inflows}}$$

$$= \frac{1,00,000}{25,000} = 4 \text{ Years}$$

(ii) Post pay-back profitability

=Cash inflow (Estimated life – Pay-back period)
=25,000 (6 – 4)
=Rs. 50,000

(iii) Post pay-back profitability index

$$= \frac{50,000}{1,00,000} \times 100 = 50\%$$

(b) Cash inflows are equal, therefore pay back period is calculated as follows:(i)

Year	Cash Inflows (Rs.)	Cumulative Cash Inflows (Rs.)
1	20,000	20,000
2	20,000	40,000
3	20,000	60,000
4	20,000	80,000

Contd....

5	20,000	1,00,000
6	8,000	1,08,000
7	8,000	1,16,000
8	8,000	1,24,000
9	8,000	1,32,000
10	8,000	1,40,000

(ii) Post pay-back profitability.

= Cash inflow (estimated life – pay-back period)

= 8,000 (10–5)

= 8000×5 = 40,000

(iii) Post pay-back profitability index

$$= \frac{40,000}{1,00,000} \times 100 = 40\%$$

Accounting Rate of Return or Average Rate of Return

Average rate of return means the average rate of return or profit taken for considering the project evaluation. This method is one of the traditional methods for evaluating the project proposals:

Merits

1. It is easy to calculate and simple to understand.
2. It is based on the accounting information rather than cash inflow.
3. It is not based on the time value of money.
4. It considers the total benefits associated with the project.

Demerits

1. It ignores the time value of money.
2. It ignores the reinvestment potential of a project.
3. Different methods are used for accounting profit. So, it leads to some difficulties in the calculation of the project.

Accept/Reject criteria

If the actual accounting rate of return is more than the predetermined required rate of return, the project would be accepted. If not it would be rejected.

Exercise 5

A company has two alternative proposals. The details are as follows:

	Proposal I	Proposal II
	Automatic Machine	Ordinary Machine
Cost of the machine	Rs. 2,20,000	Rs. 60,000
Estimated life	5½ years	8 years
Estimated sales p.a.	Rs. 1,50,000	Rs. 1,50,000
Costs : Material	50,000	50,000
Labour	12,000	60,000
Variable Overheads	24,000	20,000

Compute the profitability of the proposals under the return on investment method.

(M.Com., Madras and Bharathidasan)

Solution

Profitability Statement

	Automatic Machine	**Ordinary Machine**
Cost of the machine	Rs. 2,20,000	Rs. 60,000
Life of the machine	5½ years	8 years
	Rs.	**Rs.**
Estimated Sales	(A) 1,50,000	1,50,000
Less : Cost : Material	50,000	50,000
Labour	12,000	60,000
Variable overheads	24,000	20,000
Depreciation (1)	40,000	7,000
Total Cost	(B) 1,26,000	1,37,000
Profit (A) – (B)	24,000	12,500

Working:

(1) Depreciation = Cost □ Life

Automatic machine = 2,20,000 □ 5½ = 40,000

Ordinary machine = 60,000 □ 8 = 7,500

$$\text{Return on investment} = \frac{\text{Average profit}}{\text{Original investment}} \times 100$$

$$= \frac{24,000}{2,20,000} \times 100 \quad \frac{12,500}{60,000} \times 100$$

10.9% 20.8%

Automatic machine is more profitable than the ordinary machine.

Net Present Value

Net present value method is one of the modern methods for evaluating the project proposals. In this method cash inflows are considered with the time value of the money. Net present value describes as the summation of the present value of cash inflow and present value of cash outflow. Net present value is the difference between the total present value of future cash inflows and the total present value of future cash outflows.

Merits

1. It recognizes the time value of money.
2. It considers the total benefits arising out of the proposal.
3. It is the best method for the selection of mutually exclusive projects.
4. It helps to achieve the maximization of shareholders' wealth.

Demerits

1. It is difficult to understand and calculate.
2. It needs the discount factors for calculation of present values.
3. It is not suitable for the projects having different effective lives.

Accept/Reject criteria

If the present value of cash inflows is more than the present value of cash outflows, it would be accepted. If not, it would be rejected.

Exercise 6

From the following information, calculate the net present value of the two project andsuggest which of the two projects should be accepted a discount rate of the two.

	Project X	**Project Y**
Initial Investment	Rs. 20,000	Rs. 30,000
Estimated Life	5 years	5 years
Scrap Value	Rs. 1,000	Rs. 2,000

The profits before depreciation and after taxation (cash flows) are as follows:

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
	Rs.	Rs.	Rs.	Rs.	Rs.
Project x	5,000	10,000	10,000	3,000	2,000
Project y	20,000	10,000	5,000	3,000	2,000

Note : The following are the present value factors @ 10% p.a.

Year	1	2	3	4	5	6
Factor	0.909	0.826	0.751	0.683	0.621	0.564

(MBA, Madurai-Kamaraj University, May 2005)

Solution

Year	Cash Inflows		Present Value of Rs.1 @ 10%	Present Value of Net CashInflow	
	Project X Rs.	Project Y Rs.		Project X Rs.	Project Y Rs.
1	5,000	20,000	0.909	4,545	18,180
2	10,000	10,000	0.826	8,260	8,260
3	10,000	5,000	0.751	7,510	3,755
4	3,000	3,000	0.683	2,049	2,049
5	2,000	2,000	0.621	1,242	1,242
Scrap Value	1,000	2,000	0.621	621	1,245
Total present value				24,227	34,728
Initial investments				20,000	30,000
Net present value				4,227	4,728

Project Y should be selected as net present value of project Y is higher.

Exercise 7

The following are the cash inflows and outflows of a certain project.

Year	Outflows	Inflows
0	1,75,000	-
1	5,50,000	35,000
2		45,000
3		65,000
4		85,000
5		50,000

The salvage value at the end of 5 years is Rs. 50,000. Taking the cutoff rate as 10%,calculate net present value.

Year	1	2	3	4	5
P.V.	0.909	0.826	0.751	0.683	0.621

Solution

Year	Cash Inflows Rs.	Present Value Factor @ 10%	Present Value of Cash Inflows
1	35,000	0.909	31,815

2	45,000	0.826	37,170	

Contd....

3	65000	0.751	48815
4	85000	0.683	58055
5	50000	0.621	31050
5(Salvage)	50000	0.621	31050
		Total present value of cash inflows	237955

Less : Total present value of outflows	1,75,000
Cash outflow at the beginning	
Cash outflow at the end of first Year 50000×0.909	45,450
Total value of outflows	2,20,450
Net Present Value	17,505

If the cash inflows are not given in that cases the calculation of cash inflows are Net profit after tax+Depreciation. In this type of situation first find out the Net profit after depreciation and deducting the tax and then add the deprecation. It gives the cash inflow.

Exercise 8 From the following information you can learn after tex and depreciation concept.

Initial Outlay	**Rs. 1,00,000**
Estimated life	5 Years
Scrap Value	Rs. 10,000
Profit after tax :	
End of year 1	Rs. 6,000
2	Rs. 14,000
3	Rs. 24,000
4	16,000
5	Nil

Solution Depreciation has been calculated under straight line method. The cost of capital may be taken at 10%. P.a. is given below.

Year	1	2	3	4	5
PV factor @ 10%	0.909	0.826	0.751	0.683	0.621

$$\text{Depreciation} = \frac{\text{Initial cash outflow} - \text{scrap value}}{\text{Estimated Life of the project}}$$

$$= \frac{1,00,000 - 10,000}{5}$$

$$= \frac{90,000}{5} = \text{Rs.}18,000$$

Year	Profit after Tax	Depreciation	Cash Inflow
1	6,000	18,000	24,000
2	14,000	18,000	32,000
3	24,000	18,000	42,000
4	16,000	18,000	34,000
5	Nil	18,000	18,000

Net Present Value

Year	Cash Inflow	Discount factor @ 10%	Present value (Rs.)
1	24,000	0.909	21,816
2	32,000	0.826	26,432
3	42,000	0.751	31,542
4	34,000	0.683	23,222
5	18,000	0.621	11,178

Total present value of cash inflows	1,14,190
Less : Initial cash investment	1,00,000
Net present value	1,41,90

Internal Rate of Return

Internal rate of return is time adjusted technique and covers the disadvantages of the traditional techniques. In other words it is a rate at which discount cash flows to zero. It is expected by the following ratio:

$$\frac{\text{Cash inflow}}{\text{Investment initial}}$$

Steps to be followed: Step1. find out factor

Factor is calculated as follows:

$$F = \frac{\text{Cash outlay (or) initial investment}}{\text{Cash inflow}}$$

Step 2. Find out positive net present value **Step 3.** Find out negative net present value **Step 4.** Find out formula net present value

Formula

$$\text{IRR} = \text{Base factor} + \frac{\text{Positive net present value}}{\text{Difference in positive and Negative net present value}} \square \text{DP}$$

Base factor= Positivediscount rateDP = Difference in percentage

Merits

1. It consider the time value of money.
2. It takes into account the total cash inflow and outflow.
3. It does not use the concept of the required rate of return.
4. It gives the approximate/nearest rate of return.

Demerits

1. It involves complicated computational method.
2. It produces multiple rates which may be confusing for taking decisions.
3. It is assume that all intermediate cash flows are reinvested at the internal rateof return.

Accept/ Reject criteria

If the present value of the sum total of the compounded reinvested cash flows is greater than the present value of the outflows, the proposed project is accepted. If not it would be rejected.

Exercise 9

A company has to select one of the following two projects:

	Project A	**Project B**
Cost	Rs.22,000	20,000
Cash inflows:		
Year 1	12,000	2,000
Year 2	4,000	2,000
Year 3	2,000	4,000
Year 4	10,000	20,000

Using the Internal Rate of Return method suggest which is Preferable.

Solution

$$F = \frac{\text{Cash outlay}}{\text{Cash inflow}}$$

Project A

$$\text{Cash Inflow} = \frac{\text{Total cash inflow}}{\text{No. of years}}$$

$$= \frac{28,000}{4} = 7000$$

$$= \frac{22000}{7000} = 3.14$$

The factor thus calculated will be located in table II below. This would give the estimatedrate of return to be applied discounting the cash for the internal rate of returns. In this of project A the rate comes to 10% while in case of project B it comes to15%.

Project A

Year	Cash Inflows Rs.	Discounting Factorat 10%	Present Value Rs.
1	12000	0.909	10908
2	4000	0.826	3304
3	2000	0.751	1502
4	10000	0.683	6830
			22544
Less: Initial Investment.			22000
Net Present Value			544

The present value at 10% comes to Rs. 22,544. The initial investment is Rs. 22,000. Interest rate of return may be taken approximately at 10%.

In the case more exactness is required another trial which is slightly higher than 10%(since at this rate the present value is more than initial investment) may be taken. Taking a rate of 12% the following results would emerge.

Year	Cash Inflows Rs.	Discounting Factorat 12.6%	Present Value Rs.
1	12,000	0.893	10,716
2	4,000	0.794	3,188
3	2,000	0.712	1,424
4	10,000	0.636	6,380
	Initial Investment		21,688
	ValueNet Present Value		22,000
Less:			(–)312

$$\text{IRR} = \text{Base factor} + \frac{\text{Difference in positive and Negative net present value}}{\text{Positive net present value}} \times \text{DP}$$

Base factor= 10%

DP = 2%

$$= 10\% + \frac{544}{544 - (-312)} \times 2\%$$

$$= 10\% + \frac{544}{856} \times 2$$

$$= 10 + 1.27$$

$$= 11.27\%$$

Project B

Year	Cash Inflows Rs.	Discount Factor at 15%	Present value Rs.
1	2,000	0.909#	1,818
2	2,000	0.826	1,652
3	4,000	0.751	3,004
4	20,000	0.683	13,660
		Total present value	20,134
Less :		Initial investment	20,000
		Net present value	134

$$IRR = 10\% + \frac{134}{134 - (2676)} \times 5\%$$

$$= 10\% + 0.24\% \qquad IRR = 10.24\%$$

Thus, internal rate of return in project 'A' is higher as compared to project 'B'. Thereforeproject 'A' is preferable.

Exercise 10

A project costs Rs. 16,000 and is expected to generate cash inflows of Rs. 4,000 each 5years. Calculate the Interest Rate of Return.

Solution

$$F = \frac{16{,}000}{4{,}000} = 4$$

Facts may lays between 6% to 8%

4.221 for 6%3.993 for 8%

$4000 \times 4.21 =$	16,840
$4000 \times 3.99 =$	15,960
6% present value	16,840
Less: Investment	16,000
Net present value	840

8% present value 15,960 Less: Investment
16,000
–40

$$IRR = 6\% + \frac{840}{840-(-40)} \times 2\%$$

$$= 6\% + 1.91\%$$

$$= 7.91\%.$$

Excess Present Value Index

Excess present value is calculated on basis of net present value. It gives the results in percentage.

Exercise 11

The initial of an equipment is Rs. 10,000. Cash inflow for 5 years are estimated to be Rs. 3,500 per year. The management is desired minimum rate of excess present value index.

Solution

Present value of Rs. 1 received annually for 5 years can be had form the annuity table.

Present value of 3,500 received annually for 5 years.

$$\text{Excess presentvalueindex} = \frac{\text{Total presentvalue ofcashinflows}}{\text{Total present value of cash outflows}}$$

$$= \frac{11,732}{10,000} \times 100$$

$$= 117,32\%$$

Capital Rationing

In the rationing the company has only limited investment the project are selected according to the profitability. The project has selected the combination of proposal that will yield the greatest portability.

Exercise 12 Let us assume that a firm has only Rs. 20 lakhs to invest and funds cannot be provided. The various proposals along with the cost and profitability index are as follows.

Proposal	Pool of the project	Profitability Index
1	6,00,000	1.46
2	2,00,000	.098
3	10,00,000	2.31
4	4,00,000	1.32
5	3,00,000	1.25

Solution

In this example all proposals expect number 2 give profitability exceeding one and are profitable investments. The total outlay required to be invested in all other (profitable) project is Rs. 25,00,000(1+2+3+4+5) but total funds available with the firm are Rs. 20 lakhs and hence the firm has to do capital combination of project within a total which has the lowest profitability index along with the profitable proposals cannot be taken.

RISK AND UNCERTAINLY IN CAPITAL BUDGETING

Capital budgeting requires the projection of cash inflow and outflow of the future. The future in always uncertain, estimate of demand, production, selling price, cost etc., cannot be exact.

For example: The product at any time it become obsolete therefore, the future in unexpected. The following methods for considering the accounting of risk in capital budgeting. Various evaluation methods are used for risk and uncertainty in capital budgeting are as follows:

(i) Risk-adjusted cut off rate (or method of varying discount rate)
(ii) Certainly equivalent method.
(iii) Sensitivity technique.
(iv) Probability technique
(v) Standard deviation method.
(vi) Co-efficient of variation method.
(vii) Decision tree analysis.

(i) Risk-adjusted cutoff rate (or Method of varying)

This is one of the simplest method while calculating the risk in capital budgetingincrease cut of rate or discount factor by certain percentage an account of risk. **Exercise 13** The Ramakrishna Ltd., in considering the purchase of a new investment.

Two alternative investments are available (X and Y) each costing Rs. 150000. Cash inflows are expected to be as follows:

Cash Inflows

Year	Investment XRs.	Investment YRs.
1	60,000	65,000
2	45,000	55,000
3	35,000	40,000
4	30,000	40,000

The company has a target return on capital of 10%. Risk premium rate are 2% and 8% respectively for investment X and Y. Which investment should be preferred?

Solution

The profitability of the two investments can be compared on the basis of net presentvalues cash inflows adjusted for risk premium rates as follows:

	Investment X			Investment Y		
Year	Discount Factor10% + 2% = 12%	Cash Inflow Rs.	Present Value Rs.	Discount Factor 10% + 8%=18%	Cash Inflow Rs.	Present Values
1	0.893	60,000	53,580	0.847	85,000	71,995
2	0.797	45,000	35,865	0.718	55,000	39,490
3	0.712	35,000	24,920	0.609	40,000	24,360
4	0.635	30,000	19,050	0.516	40,000	20,640
			1,33,415			1,56,485

Investment X

Net present value = 133415 – 150000

= – Rs. 16585

Investment Y

Net present value = 156485 – 150000

= Rs. 6485

As even at a higher discount rate investment Y gives a higher net present value, investment Y should be preferred.

(ii) Certainly equivalent method

It is also another simplest method for calculating risk in capital budgeting info reduceds expected cash inflows by certain amounts it can be employed by multiplying the expected cash inflows by certainly equivalent co-efficient in order the uncertain cash inflow to certain cash inflows.

Exercise 14

There are two projects A and B. Each involves an investment of Rs. 50,000. Theexpected cash inflows and the certainly co-efficient are as under:

Year	Project A		Project B	
	Cash inflows	Certainly co-efficient	Cash inflows	Certainly Co-efficient
1	35,000	.8	25,000	.9
2	30,000	.7	35,000	.8
3	20,000	.9	20,000	.7

Risk-free cutoff rate is 10%. Suggest which of the two projects. Should be preferred.

Calculations of cash Inflows with certainly:

Year	Project A			Project B		
	Cash Inflow	Certainly Co-efficient	Certain Cash Inflow	Cash Inflow	Certainly Co-efficient	Certain Cash Inflow
1	35,000	.8	28,000	25,000	.9	22,500
2	30,000	.7	21,000	35,000	.8	28,000
3	20,000	.9	18,000	20,000	.7	14,000

Calculation of present values of cash inflows:

Year	Project A		Project B		
	Discount Factor @ 10%	Cash Inflows	Present Values	Cash Inflows	Present Value
1	0.909	28,000	25,452	22,500	20,453
2	0.826	21,000	17,346	28,000	23,128
3	0.751	18,000	13,518	14,000	10,514
Total			56,316		54,095

	Project A	Project B
Net present value	= Rs. 56,316 – 50,000	54,095 – 50,000
	= Rs. 6,316	Rs. 4,095

As the net present value of project A in more than that of project B. Project A shouldbe preferred:

(iii) Sensitivity technique

When cash inflows are sensitive under different circumstances more than one forecast of the future cash inflows may be made. These inflows may be regarded on 'Optimistic', 'most likely' and 'pessimistic'. Further cash inflows may be discounted to find out the net present values under these three different situations. If the net present values under the three situations differ widely it implies that there is a great risk in the project and the investor's is decision to accept or reject a project will depend upon his risk bearing activities.

Exercise 15

Mr. Selva is considering two mutually exclusive project 'X' and 'Y'. You are required to advise him about the acceptability of the projects from the following information.

	Project XRs.	Projects YRs.
Cost of the investment	1,0,0000	1,00,000
Forecast cash inflows per annum for 5 years		
Optimistic	60,000	55,000
Most likely	35,000	30,000
Pessimistic	20,000	20,000

(The cut-off rate may be assumed to be 15%).

Solution

Calculation of net present value of cash inflows at a discount rate of 15%.(Annuity of Re. 1 for 5 years).

For Project X

Event	Annual cash Inflow Rs.	Discount factor@ 15 %	Present valueRs.	Net Present value Rs.
Optimistic	60,000	3.3522	2,01,132	1,01,132
Most likely	35,000	3.3522	1,17,327	17,327
Pessimistic	20,000	3.3522	67,105	(32,895)

For Project Y

Event	Annual cash Inflow Rs.	Discount factor@ 15 %	Present valueRs.	Net Present value Rs.
Optimistic	55,000	3.3522	1,84,371	84,371
Most likely	30,000	3.3522	1,00,566	566
Pessimistic	20,000	3.3522	67,105	(32,895)

The net present values on calculated above indicate that project Y is more risky as compared to project X. But at the same time during favourable condition, it is more profitable also. The acceptability of the project will depend upon Mr. Selva's attitude towards risk. If he could afford to take higher risk, project Y may be more profitable.

(iv) Probability technique

Probability technique refers to the each event of future happenings are assigned with relative frequency probability. Probability means the likelihood of future event. The cash inflows of the future years further discounted with the probability. The higher present value may be accepted.

Exercise 16

Two mutually exclusive investment proposals are being considered. The following information in available.

	Project A (Rs.)	Project B (Rs.)

Cost	10,00 0	10,000

Cash inflows Year	Rs.	Probability	Rs.	Probability
1	10,000	.2	12,000	.2
2	18,000	.6	16,000	.6
3	8,000	.2	14,000	.2

Assuming cost of capital at (or) advise the selection of the project:

Solution

Calculation of net project values of the two projects.

Project A

Year	P.V. Factor@ 10 %	Cash Inflow	Probability	Monetary Value	Present Value Rs.
1	0.909	10,000	.2	2,000	1,818
2	0.826	18,000	.6	10,800	8,921
3	0.751	8,000	.2	1,600	1,202

Total Present value	11,941
Cost of Investment	10,000
Net present value	1,941

Project B

Year	P.V. Factor @ 10 %	Cash Inflow	Probability	Monetary Value	Present Value Rs.
1	0.909	12,000	.2	2,400	2,182
2	0.826	14,000	.6	8,400	6,938
3	0.751	14,000	.2	2,800	2,103

Total present value	11,223
Cost of investment	10,000
Net present value	1,223

As net present value of project A is more than that of project B after taking into consideration the probabilities of cash inflows project A is more profitable one.

(v) Standard deviation method

Two Projects have the same cash outflow and their net values are also the same, standard durations

of the expected cash inflows of the two Projects may be calculated to measure the comparative and risk of the Projects. The project having a higher standard deviation in said to be more risky as compared to the other.

Exercise 17

From the following information, ascertain which project should be selected on the basis of standard deviation.

Project X		Project Y	
Cash inflow Rs.	Probability	Cash inflow Rs.	Probability
3,200	.2	32,000	.1
5,500	.3	5,500	.4
7,400	.3	7,400	.4
8,900	.2	8,900	.1

Solution

Project X

Cash inflow	Deviation from Mean (d)	Square Deviations d^2	Probability	Weighted Deviations (td^2)
1	2	3	4	5
3,200	(–) 6,250	9,30,25,000	.2	18,60,500
5,500	(–) 750	56,2,500	.3	1,68,750
7,400	(+) 1,150	13,22,500	.3	3,96,750
8,900	(+) 2,650	70,22,500	.2	14,04,500
			n= 1	Σfd^2 = 38,30,500

$$\text{Standard Deviation (6)} = \sqrt{\frac{\Sigma fd^2}{n}}$$

$$= \sqrt{\frac{3830500}{1}}$$

$$= 1957.2$$

Project Y

1	2	3	4	5
3,200	(–) 3,050	9,30,25,000	.1	9,30,250
5,500	(–) 750	5,62,500	.4	2,25,000
7,400	(+) 1,150	13,22,500	.4	5,29,000
8,900	(+) 2,650	70,22,500	.1	7,02,250
			n= 1	Σfd^2 = 3830500

$$\text{Standard deviation(6)} = \sqrt{\frac{\Sigma fd^2}{n}}$$

$$= \sqrt{\frac{2386500}{1}}$$

$$= 1544.8$$

As the standard deviation of project X is more then that of project Y, A is more risky.

(vi) Co-efficient of variation method

Co-efficient of variation is a relative measure of dispersion. It the projects here the same cost but different net present values, relatives measure, i.e., Co-efficient of variation should be risk induced. It can be calculated as:

$$\text{Co-efficient of variation} = \frac{\text{Standarddeviation}}{\text{mean}} \times 100$$

Exercise 18

Using figure of previous example compute co-efficient of variation and suggest whichproposal should be accepted:

Solution

$$\textbf{For project X} = \frac{1957.2}{6250} \times 100$$

$$= 31.31\%$$

$$\textbf{For project Y} = \frac{1544.8}{6250} \times 100$$

$$= 29.52\%$$

As the co-efficient of variation of project 'X' in more then that 'Y' project X in more risk. Hence, project Y should be selected.

(vii) Decision tree analysis

In the modern business world, putting the investments are become more complex and taking decisions in the risky situations. So, the decision tree analysis helpful for taking risky and complex decisions, because it consider all the possible event's and each possible events are assigned with the probability.

Construction of Decision Tree

1. Defined the problem
2. Evaluate the different alternatives
3. Indicating the decision points
4. Assign the probabilities of the monetary values
5. Analysis the alternatives.

If the net present values are in positive the project may be accepted otherwise it is rejected.

Exercise 19

Mr. Kumar in considering an investment proposal of Rs.40,000. The expected returnsduring the left of the investment are as under:

Year I

Event	Cash Inflow	Probability
(i)	16,000	.3
(ii)	24,000	.5
(iii)	20,000	.2

Year II

Cash inflows in **year1** are:

	16,000		24,000		20,000	
	Cash Inflows (Rs.)	Prob	Cash Inflows (Rs.)	Prob	Cash Inflows (Rs.)	Prob
(i)	30,000	.2	40,000	.1	5,000	.2
(ii)	40,000	.6	60,000	.8	8,000	.5
(iii)	50,000	.2	80,000	.1	12,000	.3

using 10% as the cost of capital, advise about the acceptability of the proposal:

Solution

Calculation of net present values of cash inflows

Year	Year I Prob. Cash Inflow		Year II Prob. Cash Inflow	Net Present Value of Inflow	Joint Prob.	Expected NetPresent value
		.2	30,000	(–) 676	.06	(–) 40.56
	.3 1,6000	.6	40,000	7,584	.18	1,365.12
		.2	50,000	15,844	.06	950.64
Cash outflow Rs.40,000		.1	20,000	14,856	.04	742.80
	.5 24,000	.8	60,000	31,376	.10	2,550.40
		.1	80,000	47,896	.06	2,394.80
		.2	50,000	19,480	.04	779.20
	.2 20,000	.5	80,000	44,260	.10	4,426.00
		.3	1,20,000	77,300	.06	4,638.00
					1.00	27,806.40

As the proposal yields a net present value of +27806.40 at a discount for of 10% the proposal may be accepted.

MODEL QUESTIONS

1. What is capital budgeting? Explain its needs and importance.
2. What are the stages of capital budgeting process?
3. Explain the various methods of capital budgeting techniques.
4. What is risk and uncertainty?
5. Calculate the payback period from the following information:
   Cash outlay Rs. 50,000 and cash inflow Rs. 12,500. (**Ans.** 4 years)
6. From the following information, calculate the pay-back periods for the 3 projects. Which liquors Rs. 2,00,000 each? Suggest most profitable project.

Year	Project I	Project II	Project III
1	50,000	60,000	35,000
2	50,000	70,000	45,000
3	50,000	75,000	85,000
4	50,000	45,000	50,000
5	50,000	–	35,000

7. The machine cost Rs. 1,00,000 and has scrap value of Rs. 10,000 after 5 years. The net profits before depreciation and taxes for the five years period are to be projected that Rs. 20,000, Rs. 24,000, Rs. 30,000, Rs. 26,000 and Rs. 22,000. Taxes are 50%. Calculate pay-back period and accounting rate of return.
   (**Ans.** 4 years 3 months and 11.2%)
8. A company has to choose one of the following two actually exclusive machine. Both the machines have to be depreciated. Calculate NPV.

Cash inflows

Year	Machine X	Machine Y
0	–20,000	–20,000
1	5,500	6,200
2	6,200	8,800
3	7,800	4,300
4	4,500	3,700
5	3,000	2,000

(**Ans.** Machine X is recommended)

9. A machine costs Rs. 1,25,000. The cost of capital is 15%. The net cash inflows are as under:

Year	Rs.
1	25,000
2	35,000
3	50,000
4	40,000
5	25,000

Calculate internal rate of return and suggest whether the project should be accepted of cost.

(**Ans.** Reject the machine)

10. Which project will be selected under NPU and IRR?

	A	B
Cash outflow	2,00,000	3,00,000
Cash inflows at the end of		
1 Year	60,000	40,000
2 Year	50,000	50,000
3 Year	50,000	60,000
4 Year	40,000	90,000
5 Year	30,000	1,00,000
Cost of capital is 10%.		

(Reject the two projects because less then the cost of capital).

11. SP Limited company is having two projects, requiring a capital outflow of Rs. 3,00,000. The expected annual income after depreciation but before tax is as follows:

Year	Rs.
1	9,000
2	80,000
3	70,000
4	60,000
5	50,000

Depreciation may be taken as 20% of original cost and taxation at 50% of netincome:

You are required 10 calculated

(a) Pay-back period
(b) Net present value
(c) According rate of return
(d) Net present value index.
(e) Internal rate of return.

(**Ans.** 3.5 years, Rs. 25,745, 43.437%, 108.58%, 13.87%)

12. From the following information, select which project is better.

Cash Inflows (Year)	I	I I
0	–20,000	–20,000
1	7,000	8,000
2	7,000	9,000
3	6,000	5,000

Risk less discount rate is 5%. Project I is less risks as compared to project II. The management consider risk premium rates at 5% and 10% respectively appropriate for discounting the cash inflows.

13. There are two mutually exclusive projects I and II. Each projects requires an investment of Rs. 60,000. The following are the cash inflows and certainly co- efficient are as follows.

Year	Project I		Project II	
	Cash inflow	Certainty Co-efficient	Cash Inflow	Certainty Co-efficient
1	30,000	.7	25,000	.9
2	25,000	.8	25,000	.8
3	25,000	.9	30,000	.7

Risk-free cutoff rate is 10%. Evaluate which project will be considered.

(**Ans.** Project II is considered)

14. Mr. X is considering two mutually exclusive investment I and II. From the following details advice Mr. X.

	Project I	Project II
Cost of investment	75,000	75,000
Annual income for 5 years	37,500	41,250
Optimistic		
Most likely	26,250	22,500
Pesionistic	15,000	15,000

The cutoff rate is 12%.

(**Ans.** Project B is preferred)

15. Two mutually exclusive projects are being considered. The following detail is available:

Year	Project A		Project B	
	Rs.	Profitability	Rs.	Profitability
1	12,000	-	12,000	-
2	10,000	.2	10,000	.2
3	15,000	.6	20,000	.6
4	25,000	.2	20,000	.2

(**Ans.** select Project B)

16. Mr. A is considering two mutually exclusive investment projects, from following information select the Project on the basis of standard deviation and co-efficient of variation method.

Cash	Project I Rs. 15,000.		Project II Rs. 15,000	
Cash inflow Year	Rs.	Probabilities	Rs.	Probabilities
1	3,000	.3	4,000	.1
2	4,000	.2	6,000	.4
3	7,000	.3	7,000	.3
4	6,000	.2	3,000	.2

(**Ans.** I Rs. 1673 and 33.46%
II Rs. 1581 and 31.62%
Select Project II)

17. Mr. X is considering the project an investment of Rs. 26,000. The expensed returns during the life if the project of are as follows:

Year I

Event	Cash inflow	Probability
a	12,000	.2
b	14,000	.6
c	9,000	.2

Year II

Cash inflows is year I are.

	Rs. 12,000		Rs. 14,000		Rs. 9,000	
	Cash inflow	Probability	Cash inflow	Probability	Cash inflow	Probability
1	18,000	.3	22,000	.2	28,000	.4
2	20,000	.4	26,000	.7	32,000	.5
3	20,000	.3	30,000	.1	35,000	.1

Using 10% as the use of capital, advise about the acceptability of the proposal. (**Ans.** Accept the project because+Rs. 6657 at 10%)

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Chapter 10 Working Capital

INTRODUCTION

Working capital management is also one of the important parts of the financial management. It is concerned with short-term finance of the business concern which is a closely related trade between profitability and liquidity. Efficient working capital management leads to improve the operating performance of the business concern and it helps to meet the short- term liquidity. Hence, study of working capital management is not only an important part of financial management but also are overall management of the business concern.

Working capital is described as the capital which is not fixed but the more common uses of the working capital is to consider it as the difference between the book value of current assets and current liabilities.

This chapter deals with the following important aspects of the working capital management.

- Meaning of Working Capital
- Concept of Working Capital
- Types of Working Capital
- Needs of Working Capital
- Factors determining Working Capital
- Computation of Working Capital
- Sources of Working Capital
- Working Capital Management Policy
- Working Capital and Banking Committee

MEANING OF WORKING CAPITAL

Capital of the concern may be divided into two major headings.

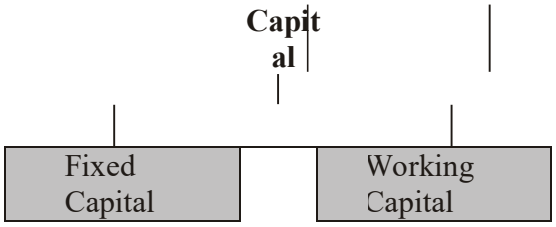


***Fig. 10.1** Capital of the Business*

Fixed capital means that capital, which is used for long-term investment of the business concern. For example, purchase of permanent assets. Normally it consists of non-recurring in nature.

Working Capital is another part of the capital which is needed for meeting day to day requirement of the business concern. For example, payment to creditors, salary paid to workers, purchase of raw materials etc., normally it consists of recurring in nature. It can be easily converted into cash. Hence, it is also known as short-term capital.

Definitions

According to the definition of **Mead, Baker and Malott,** "Working Capital means Current Assets".

According to the definition of **J.S.Mill,** "The sum of the current asset is the working capital of a business".

According to the definition of **Weston and Brigham,** "Working Capital refers to a firm's investment in short-term assets, cash, short-term securities, accounts receivables and inventories".

According to the definition of **Bonneville,** "Any acquisition of funds which increases the current assets, increase working capital also for they are one and the same".

According to the definition of **Shubin,** "Working Capital is the amount of funds necessary to cover the cost of operating the enterprises".

According to the definition of **Genestenberg,** "Circulating capital means current assets of a company that are changed in the ordinary course of business from one form to another, for example, from cash to inventories, inventories to receivables, receivables to cash".

CONCEPT OF WORKING CAPITAL

Working capital can be classified or understood with the help of the following two important concepts.

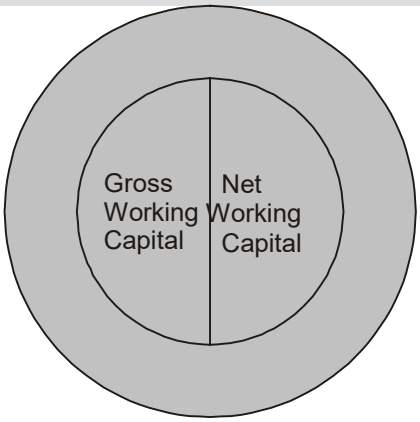


***Fig. 10.2** Working Capital Concept*

Gross Working Capital

Gross Working Capital is the general concept which determines the working capital concept. Thus, the gross working capital is the capital invested in total current assets of the business concern.

Gross Working Capital is simply called as the total current assets of the concern.

$$\boxed{\mathbf{GWC = CA}}$$

Net Working Capital

Net Working Capital is the specific concept, which, considers both current assets andcurrent liability of theconcern.

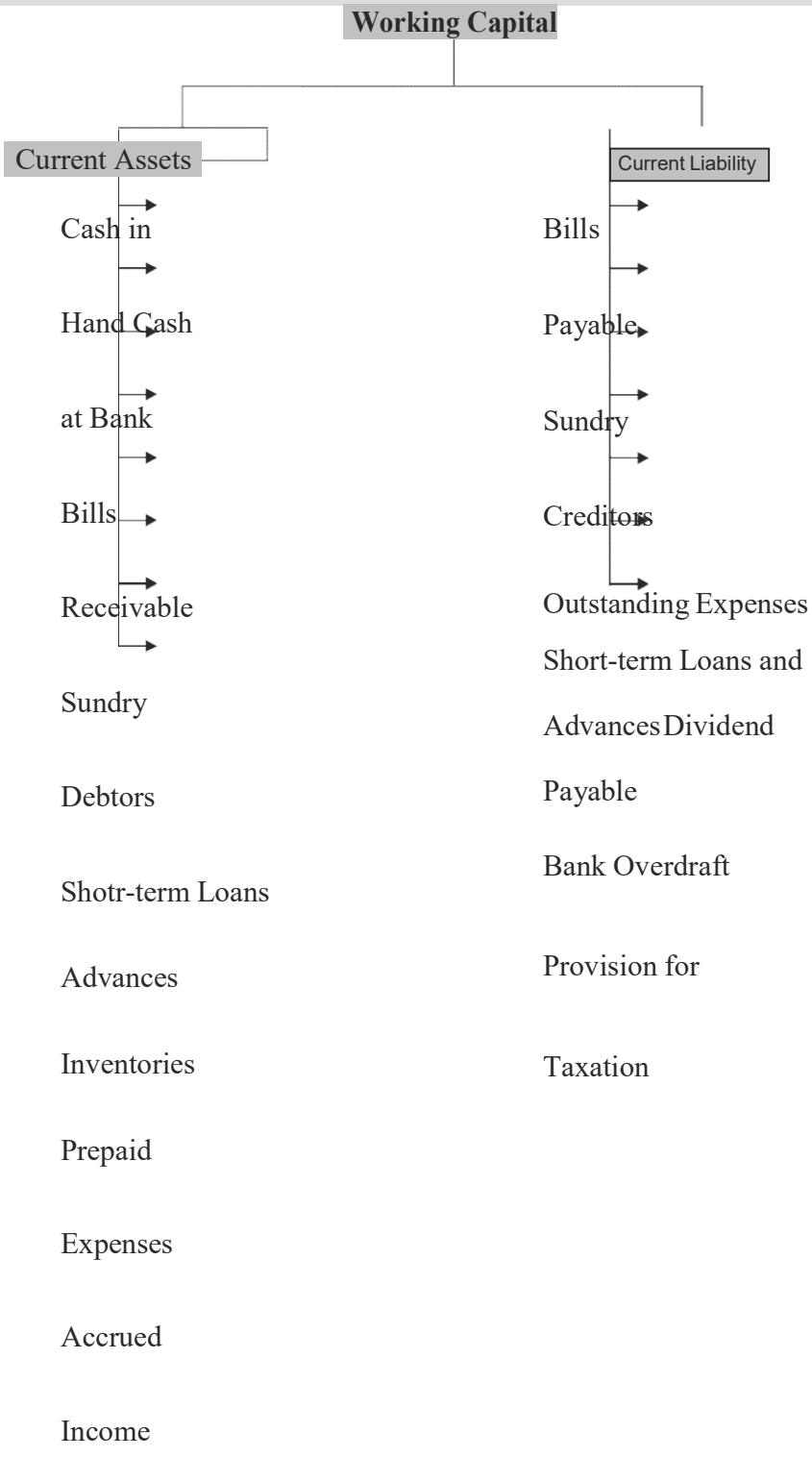
Net Working Capital is the excess of current assets over the current liability of theconcern during a particular period.

If the current assets exceed the current liabilities it is said to be positive workingcapital; it is reverse, it is said to be Negative working capital.

$$\boxed{\mathbf{NWC = C\,A - CL}}$$

Component of Working Capital

Working capital constitutes various current assets and current liabilities. This can be illustrated by the following chart.



TYPES OF WORKING CAPITAL

Working Capital may be classified into three important types on the basis of time.

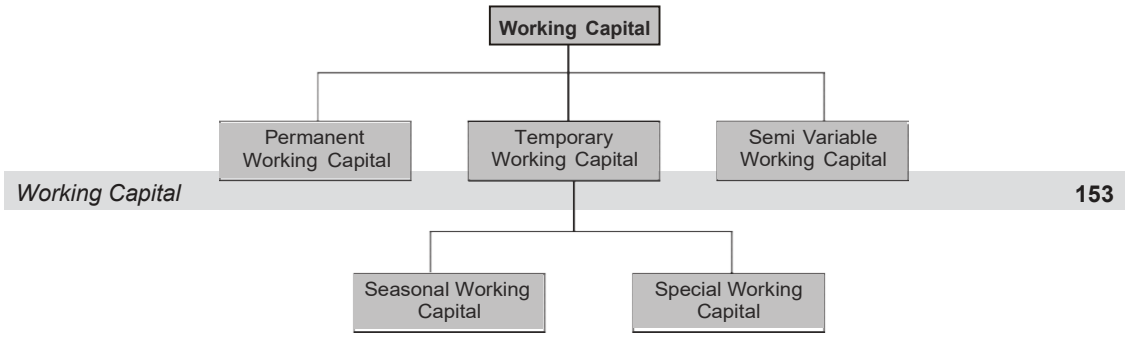


Fig. 10.3 *Types of Working Capital*

Permanent Working Capital

It is also known as Fixed Working Capital. It is the capital; the business concern must maintain certain amount of capital at minimum level at all times. The level of Permanent Capital depends upon the nature of the business. Permanent or Fixed Working Capital will not change irrespective of time or volume of sales.

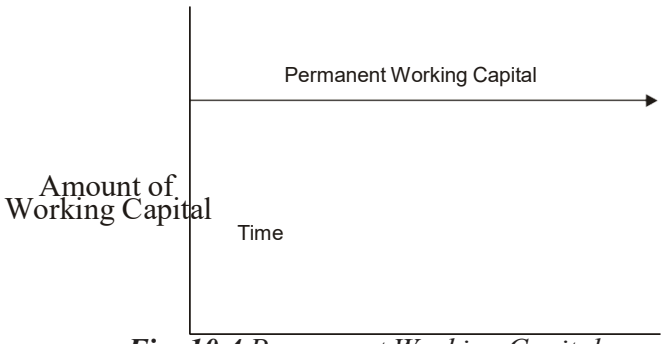


***Fig. 10.4** Permanent Working Capital*

Temporary Working Capital

It is also known as variable working capital. It is the amount of capital which is required to meet the Seasonal demands and some special purposes. It can be further classified into Seasonal Working Capital and Special Working Capital.

The capital required to meet the seasonal needs of the business concern is called as Seasonal Working Capital. The capital required to meet the special exigencies such as launching of extensive marketing campaigns for conducting research, etc.

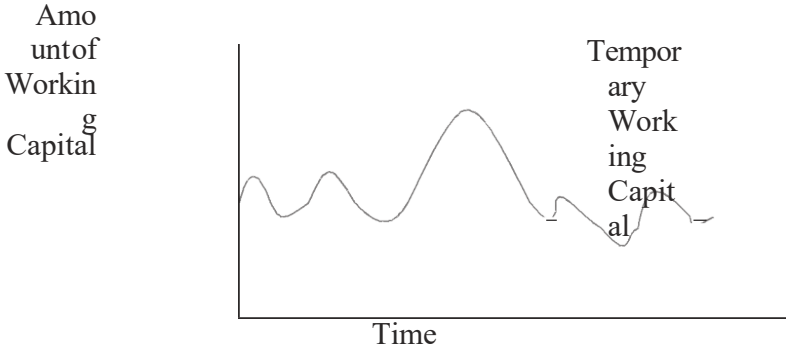


***Fig. 10.5** Temporary Working Capital*

Semi Variable Working Capital

Certain amount of Working Capital is in the field level up to a certain stage and after that itwill increase depending upon the change of sales or time.

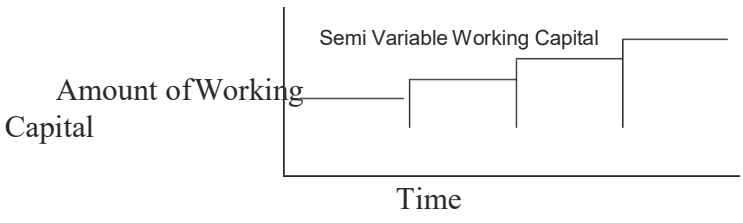


***Fig. 10.6** Semi Variable Working Capital*

NEEDS OF WORKING CAPITAL

Working Capital is an essential part of the business concern. Every business concern must maintain certain amount of Working Capital for their day-to-day requirements and meet the short-term obligations.

Working Capital is needed for the following purposes.

1. **Purchase of raw materials and spares:** The basic part of manufacturing process is, raw materials. It should purchase frequently according to the needs of the business concern. Hence, every business concern maintains certain amount as Working Capital to purchase raw materials, components, spares, etc.
2. **Payment of wages and salary:** The next part of Working Capital is payment of wages and salaries to labour and employees. Periodical payment facilities make employees perfect in their work. So a business concern maintains adequate the amount of working capital to make the payment of wages and salaries.
3. **Day-to-day expenses:** A business concern has to meet various expenditures regarding the operations at daily basis like fuel, power, office expenses, etc.
4. **Provide credit obligations:** A business concern responsible to provide credit facilities to the customer and meet the short-term obligation. So the concern must provide adequate Working Capital.

Working Capital Position/ Balanced Working Capital Position.

A business concern must maintain a sound Working Capital position to improve the efficiency of business operation and efficient management of finance. Both excessive and inadequate Working Capital lead to some problems in the business concern.

A. Causes and effects of excessive working capital.

(i) Excessive Working Capital leads to unnecessary accumulation of raw materials, components and spares.
(ii) Excessive Working Capital results in locking up of excess Working Capital.
(iii) It creates bad debts, reduces collection periods, etc.
(iv) It leads to reduce the profits.

B. Causes and effects of inadequate working capital

(i) Inadequate working capital cannot buy its requirements in bulk order.
(ii) It becomes difficult to implement operating plans and activate the firm's profit target.
(iii) It becomes impossible to utilize efficiently the fixed assets.
(iv) The rate of return on investments also falls with the shortage of Working Capital.
(v) It reduces the overall operation of the business.

FACTORS DETERMINING WORKING CAPITAL REQUIREMENTS

Working Capital requirements depends upon various factors. There are no set of rules or formula to determine the Working Capital needs of the business concern. The following are the major factors which are determining the Working Capital requirements.

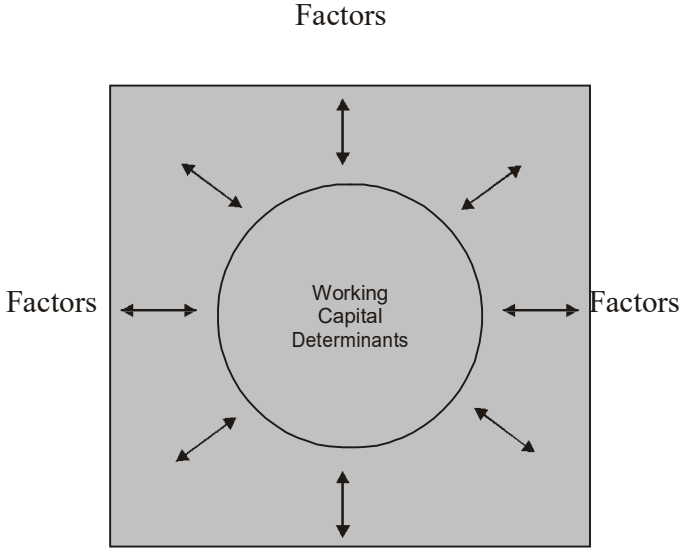


***Fig. 10.7** Factors Determining Working Capital Requirements*

1. **Nature of business:** Working Capital of the business concerns largely depend upon the nature of the business. If the business concerns follow rigid credit policy and sell goods only for cash, they can maintain lesser amount of Working Capital. A transport company maintains lesser amount of Working Capital while a construction company maintains larger amount of Working Capital.
2. **Production cycle:** Amount of Working Capital depends upon the length of the production cycle. If the production cycle length is small, they need to maintain lesser amount of Working Capital. If it is not, they have to maintain large amountof Working Capital.
3. **Business cycle:** Business fluctuations lead to cyclical and seasonal changes in the business condition and it will affect the requirements of the Working Capital. In the booming conditions, the Working Capital requirement is larger and in the depression condition, requirement of Working Capital will reduce. Better business results lead to increase the Working Capital requirements.
4. **Production policy:** It is also one of the factors which affects the Working Capital requirement of the business concern. If the company maintains the continues production policy, there is a need of regular Working Capital. If the production policy of the company depends upon the situation or conditions, Working Capital requirement will depend upon the conditions laid down by the company.

5. **Credit policy:** Credit policy of sales and purchase also affect the Working Capital requirements of the business concern. If the company maintains liberal credit policy to collect the payments from its customers, they have to maintain more Working Capital. If the company pays the dues on the last date it will create the cash maintenance in hand and bank.
6. **Growth and expansion:** During the growth and expansion of the business concern, Working Capital requirements are higher, because it needs some additional Working Capital and incurs some extra expenses at the initial stages.
7. **Availability of raw materials:** Major part of the Working Capital requirements are largely depend on the availability of raw materials. Raw materials are the basic components of the production process. If the raw material is not readily available, it leads to production stoppage. So, the concern must maintain adequate raw material; for that purpose, they have to spend some amount of Working Capital.
8. **Earning capacity:** If the business concern consists of high level of earning capacity, they can generate more Working Capital, with the help of cash from operation. Earning capacity is also one of the factors which determines the Working Capital requirements of the business concern.

COMPUTATION (OR ESTIMATION) OF WORKING CAPITAL

Working Capital requirement depends upon number of factors, which are already discussed in the previous parts. Now the discussion is on how to calculate the Working Capital needs of the business concern. It may also depend upon various factors but some of the common methods are used to estimate the Working Capital.

A. Estimation of components of working capital method

Working capital consists of various current assets and current liabilities. Hence, we have to estimate how much current assets as inventories required and how much cash required to meet the short term obligations.

Finance Manager first estimates the assets and required Working Capital for a particular period.

B. Percent of sales method

Based on the past experience between Sales and Working Capital requirements, a ratio can be determined for estimating the Working Capital requirement in future. It is the simple and tradition method to estimate the Working Capital requirements. Under this method, first we have to find out the sales to Working Capital ratio and based on that we have to estimate Working Capital requirements. This method also expresses the relationship between the Sales and Working Capital.

C. Operating cycle

Working Capital requirements depend upon the operating cycle of the business. The operating cycle begins with the acquisition of raw material and ends with the collection of receivables.

Operating cycle consists of the following important stages:

1. Raw Material and Storage Stage, (R)
2. Work in Process Stage, (W)
3. Finished Goods Stage, (F)
4. Debtors Collection Stage, (D)
5. Creditors Payment Period Stage. (C)

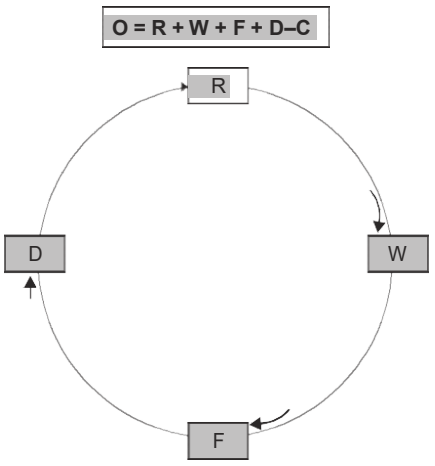


Fig. 10.8 *Working Capital Cycle*

Each component of the operating cycle can be calculated by the following formula:

$$R = \frac{\text{Average Stock of Raw Material}}{\text{Average Raw Material Consumption Per Day}}$$

$$W = \frac{\text{Average Work in Process Inventory}}{\text{Average Cost of Production Per Day}}$$

$$F = \frac{\text{Average Finished Stock Inventory}}{\text{Average Cost of Goods Sold Per Day}}$$

$$D = \frac{\text{Average Book Debts}}{\text{Average Credit Sales Per Day}}$$

$$C = \frac{\text{Average Trade Creditors}}{\text{Average Credit Purchase Per Day}}$$

Exercise 1

From the following information extracted from the books of a manufacturing company, compute the operating cycle in days and the amount of working capital required:

Period Covered	365 days
Average period of credit allowed by suppliers	16 days
Average Total of Debtors Outstanding	480 00
Raw Material Consumption	4,400 00
Total Production Cost	10,000 00
Total Cost of Sales	10,500 00
Sales for the year	16,000 00
Value of Average Stock maintained:	
Raw Material	320 00
Work-in-progress	350 00
Finished Goods	260 00

(ICWA Final, JUNE, 1986 adapted)

Solution

Computation of Operating Cycle

(i) Raw material held in stock:

$$\frac{\text{Average stocks of raw materials held}}{\text{Average consumption per day}} = \frac{320}{4{,}400 \times 365}$$

$$= \frac{320 \times 365}{4{,}400} = 275 \text{ days}$$

Less: Average credit period granted by Suppliers 16 days

11 days

(ii) Work-in-progress:

$$\frac{\text{Average WIP maintained}}{\text{Average cost of production per day}} = \frac{350}{10{,}000/365}$$

$$= \frac{365 \times 320}{10{,}000} = 13 \text{ days}$$

(iii) Finished good held in stock:

$$\frac{\text{Average finished goods maintained}}{\text{Average cost of goods sold per days}} = \frac{260}{10{,}500/365}$$

$$= \frac{260 \times 365}{10{,}500} = 9 \text{ days}$$

(iv) *Credit period allowed to debtors:*

$$\frac{\text{Average total of outstanding debtors}}{\text{Average credit sales per day}} = \frac{480}{16{,}000 \times 365}$$

$$= \frac{365 \times 480}{16{,}000} = 11 \text{days}$$

Total operating cycle period: (i) + (ii) + (iii) + (iv) = 44 days Number of Operating cycles in a year = 365/44

= 8.30

$$\text{Capital required} = \frac{\text{Total operating cost}}{\text{Number of operating cycles in a year}} \text{Amount of Working}$$

= 10,500/8.3

= Rs. 1,265

Alternatively, the amount of working capital could have also been calculated by estimating the components of working capital method, as shown below:

Value of Average Stock	Maintained	320
Raw Material		350
Work-in-progress		260
Finished Goods		480
		1,410
Average Debtors Outstanding:		
Less: Average Creditors Outstanding		145
		1,265

WORKING CAPITAL MANAGEMENT POLICY

Working Capital Management formulates policies to manage and handle efficiently; for that purpose, the management established three policies based on the relationship between Sales and Working Capital.

1. Conservative Working Capital Policy.
2. Moderate Working Capital Policy.
3. Aggressive Working Capital Policy.

1. **Conservative working capital policy:** Conservative Working Capital Policy refers to minimize risk by maintaining a higher level of Working Capital. This type of Working Capital Policy is suitable to meet the seasonal fluctuation of the manufacturing operation.

2. **Moderate working capital policy:** Moderate Working Capital Policy refers to the moderate level of Working Capital maintainance according to moderate level of sales. It means one percent of change in Working Capital, that is Working Capital is equal to sales.
3. **Aggressive working capital policy:** Aggressive Working Capital Policy is one of the high risky and profitability policies which maintains low level of Aggressive Working Capital against the high level of sales, in the business concern during a particular period.

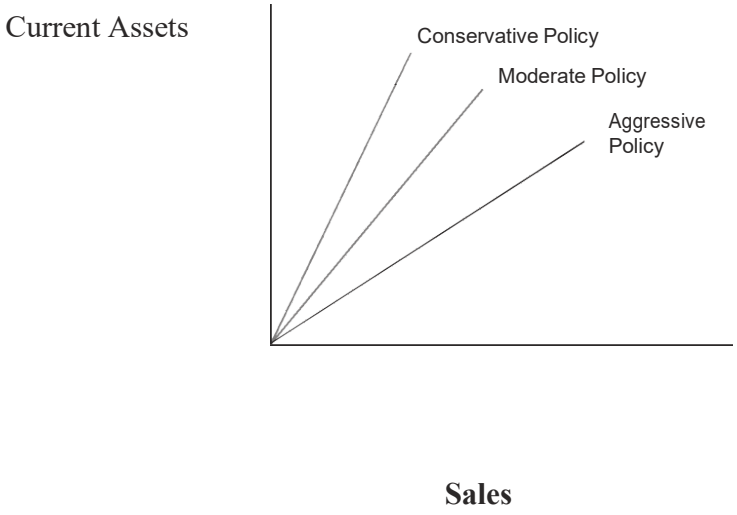


Fig. 10.9 *Working Capital Policies*

SOURCES OF WORKING CAPITAL

Working Capital requirement can be normalized from short-term and long-term sources. Each source will have both merits and limitations up to certain extract. Uses of Working Capital may be differing from stage to stage.

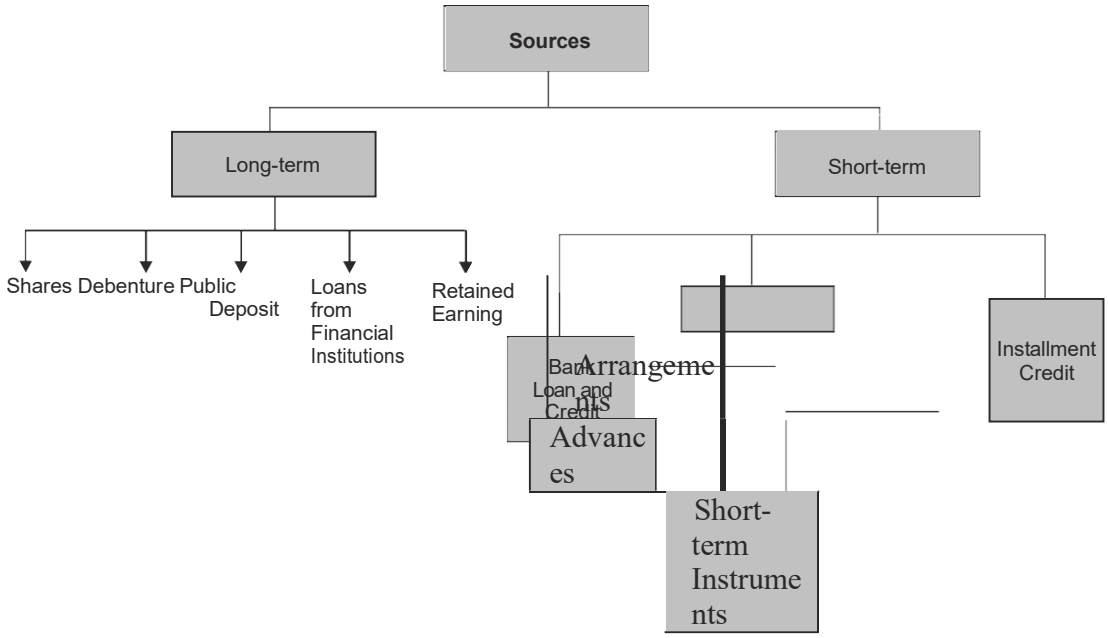


Fig. 10.10 *Sources of Working Capital*

The above sources are also classified into internal sources and external sources of working capital.

Internal sources such as:

- Retained Earnings
- Reserve and Surplus
- Depreciation Funds etc. External sources

such as:

- Debentures and Public Deposits
- Loans from Banks and Financial Institutions
- Advances and Credit
- Financial arrangements like Factoring, etc.

Determining the Finance Mix

Determining the finance mix is an important part of working capital management. Under this decision, the relationship among risk, return and liquidity are measured and also which type of financing is suitable to meet the Working Capital requirements of the business concern. There are three basic approaches for determining an appropriate Working Capital finance mix.

1. Hedging or matching approach
2. Conservative approach
3. Aggressive approach.

Hedging Approach

Hedging approach is also known as matching approach. Under this approach, the business concern can adopt a financial plan which matches the expected life of assets with the expected life of the sources of funds raised to finance assets.

When the business follows matching approach, long-term finance shall be used to fixed assets and permanent current assets and short-term financing to finance temporary or variable assets.

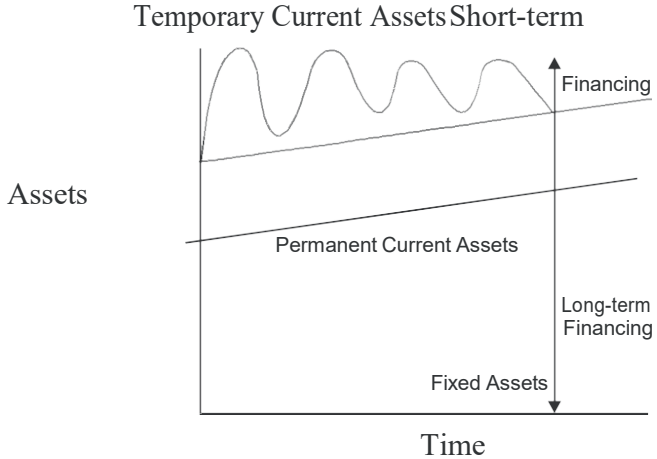


Fig. 10.11 *Financing under Matching Approach*

Conservative Approach

Under this approach, the entire estimated finance in current assets should be financed from long-term sources and the short-term sources should be used only for emergency requirements. This approach is called as "Low Profit – Low Risk" concept.

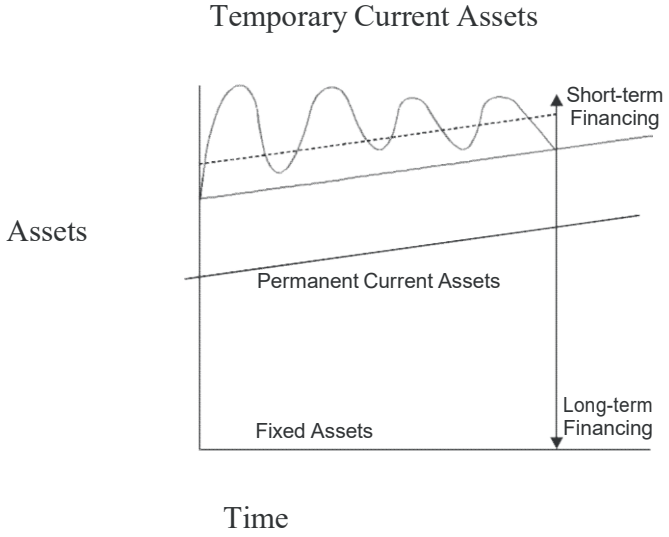


Fig. 10.12 *Conservative Approach*

Aggressive Approach

Under this approach, the entire estimated requirement of current assets should be financed from short-term sources and even a part of fixed assets financing be financed from short- term sources. This approach makes the finance mix more risky, less costly and more profitable.

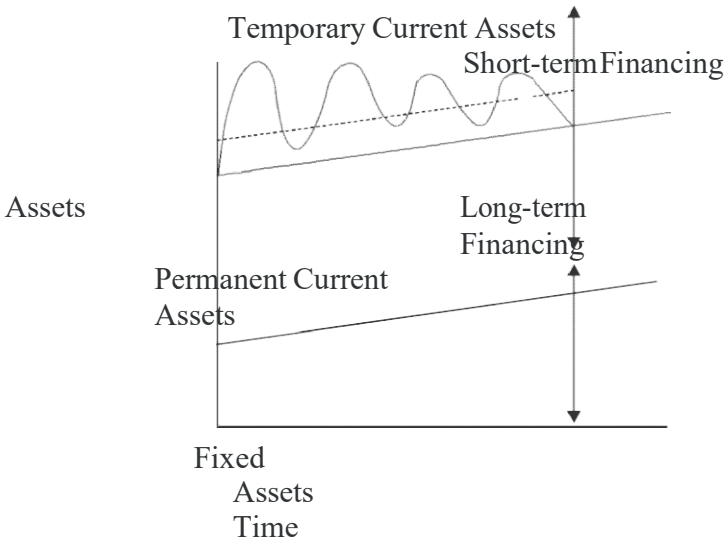


Fig. 10.13 *Aggressive Approach*

WORKING CAPITAL AND BANKING COMMITTEE

Banking finance to working capital requirements is a very important part of the business concern. Banks provide finance to business concerns to meet the requirements. To regulate and control bank finance, RBI constitute committees. These committees submit reports with findings and recommendations to formulate the finance policy of the banks. The major committee and the recommendations are as follows:

Committee	Year	Major Recommendations
DEHEJIA	1969	Appraisal of credit applications received by banks for granting loan.
TANDON	1975	Banks must carry out the realize appraisal for granting loan Fixationof norms for bank lending to industry.
CHORE	1980	No bifurcation of cash credit accounts separate limits for peak leveland non peak level requirements.
MARATHE	1984	Second method of lending to industry, introduction of fast trackconcept.
KANNAN	1997	Regular conduct with the borrowers, periodical monitoring the credit disposition.

MODEL QUESTIONS

1. What is working capital? Define it.
2. Discuss the concept of working capital?
3. What are the types of working capital.
4. Explain the needs of working capital.
5. Critically explain the factors affecting the requirement of working capital.
6. Explain the working capital management policy.

Chapter 11 Working Capital Management

Management of Working Capital is also an important part of financial manager. The main objective of the Working Capital Management is managing the Current Asset and Current Liabilities effectively and maintaining adequate amount of both Current Asset and Current Liabilities. Simply it is called Administration of Current Asset and Current Liabilities of the business concern.

Management of key components of working capital like cash, inventories and receivables assumes paramount importance due to the fact the major potion of working capital gets blocked in these assets.

Meaning

Working capital management is an act of planning, organizing and controlling the components of working capital like cash, bank balance inventory, receivables, payables, overdraft and short-term loans.

Definition

According to **Smith K.V,** "Working capital management is concerned with the problems that arise in attempting to manage the current asset, current liabilities and the inter- relationship that exist between them".

According to **Weston and Brigham,** "Working capital generally stands for excess of current assets over current liabilities. Working capital management therefore refers to all aspects of the administration of both current assets and current liabilities".

INVENTORY MANAGEMENT

Introduction

Inventories constitute the most significant part of current assets of the business concern. It is also essential for smooth running of the business activities.

A proper planning of purchasing of raw material, handling, storing and recording is to be considered as a part of inventory management. Inventory management means, management of raw materials and related items. Inventory management considers what to purchase, how to purchase, how much to purchase, from where to purchase, where to store and when to use for production etc.

Meaning

The dictionary meaning of the inventory is stock of goods or a list of goods. In accounting language, inventory means stock of finished goods. In a manufacturing point of view, inventory includes, raw material, work in process, stores, etc.

Kinds of Inventories

Inventories can be classified into five major categories.

A. *Raw Material*
   It is basic and important part of inventories. These are goods which have not yetbeen committed to production in a manufacturing business concern.
B. *Work in Progress*
   These include those materials which have been committed to production processbut have not yet been completed.
C. *Consumables*
   These are the materials which are needed to smooth running of the manufacturingprocess.
D. *Finished Goods*
   These are the final output of the production process of the business concern. Itis ready for consumers.
E. *Spares*
   It is also a part of inventories, which includes small spares and parts.

Objectives of Inventory Management

Inventory occupy 30–80% of the total current assets of the business concern. It is also very essential part not only in the field of Financial Management but also it is closely associated with production management. Hence, in any working capital decision regarding the inventories, it will affect both financial and production function of the concern. Hence, efficient management of inventories is an essential part of any kind of manufacturing processconcern.

The major objectives of the inventory management are as follows:

- To efficient and smooth production process.
- To maintain optimum inventory to maximize the profitability.
- To meet the seasonal demand of the products.

- To avoid price increase in future.
- To ensure the level and site of inventories required.
- To plan when to purchase and where to purchase
- To avoid both over stock and under stock of inventory.

Techniques of Inventory Management

Inventory management consists of effective control and administration of inventories. Inventory control refers to a system which ensures supply of required quantity and quality of inventories at the required time and at the same time prevent unnecessary investment in inventories. It needs the following important techniques.

Inventory management techniques may be classified into various types:

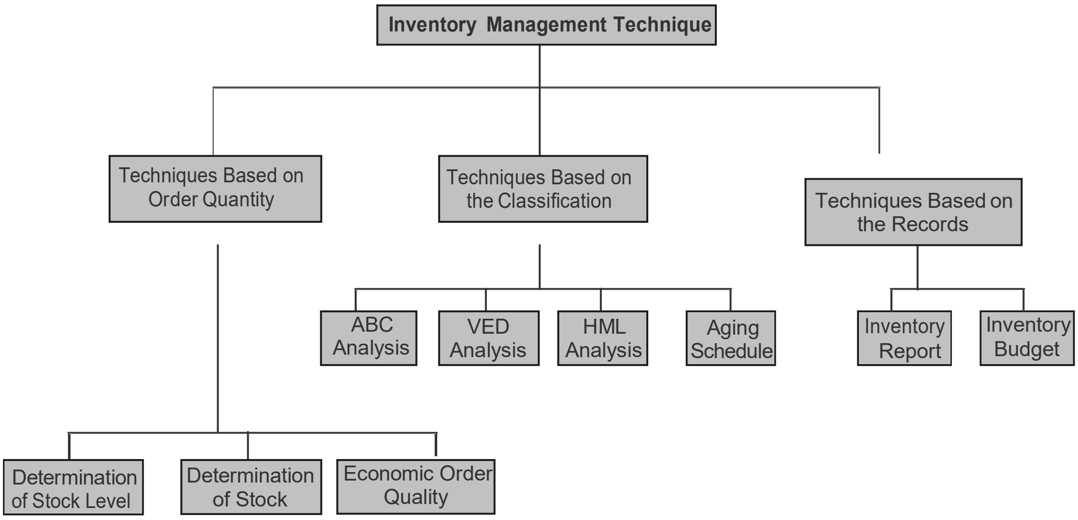


Fig. 11.1 *Inventory Management Techniques*

A. Techniques based on the order quantity of Inventories

Order quantity of inventories can be determined with the help of the followingtechniques:

Stock Level

Stock level is the level of stock which is maintained by the business concern at all times. Therefore, the business concern must maintain optimum level of stock to smooth running of the business process. Different level of stock can be determined based on the volume of the stock.

Minimum Level

The business concern must maintain minimum level of stock at all times. If the stocks areless than the minimum level, then the work will stop due to shortage of material.

Re-order Level

Re-ordering level is fixed between minimum level and maximum level. Re-order level is thelevel when the business concern makes fresh order at this level.

$$\text{Re-order level} = \text{maximum consumption} \times \text{maximum Re-order period.}$$

Maximum Level

It is the maximum limit of the quantity of inventories, the business concern must maintain.If the quantity exceeds maximum level limit then it will be overstocking.

$$\text{Maximum level} = \text{Re-order level} + \text{Re-order quantity} - (\text{Minimum consumption} \times \text{Minimum delivery period})$$

Danger Level

It is the level below the minimum level. It leads to stoppage of the production process.

$$\text{Danger level} = \text{Average consumption} \times \text{Maximum re-order period for emergency purchase}$$

Average Stock Level

It is calculated such as,

$$\text{Average stock level} = \text{Minimum stock level} + \frac{1}{2} \text{ of re-order quantity maximum level}$$

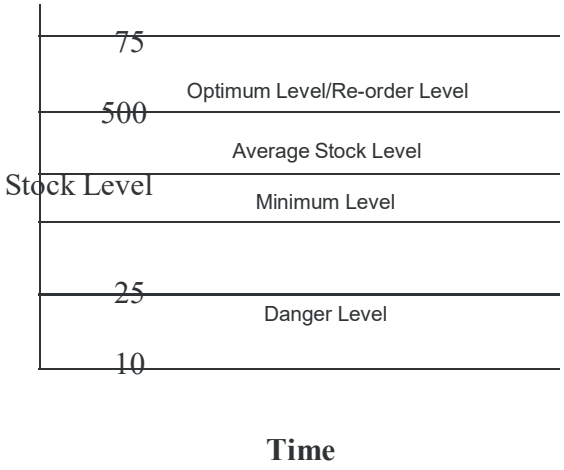


***Fig. 11.2** Determining the Stock Level*

Lead Time

Lead time is the time normally taken in receiving delivery after placing orders with suppliers. The time taken in processing the order and then executing it is known as lead time.

Safety Stock

Safety stock implies extra inventories that can be drawn down when actual lead time and/ or usage rates are greater than expected. Safety stocks are determined by opportunity cost and carrying cost of inventories. If the business concerns maintain low level of safety stock, it will lead to larger opportunity cost and the larger quantity of safety stock involves higher carrying costs.

Economic Order Quantity (EOQ)

EOQ refers to the level of inventory at which the total cost of inventory comprising ordering cost and carrying cost. Determining an optimum level involves two types of cost such as ordering cost and carrying cost. The EOQ is that inventory level that minimizes the total of ordering of carrying cost.

EOQ can be calculated with the help of the mathematical formula:

$$EOQ = \sqrt{2ab/c}$$

Where,

a = Annual usage of inventories (units)b = Buying cost per order

c = Carrying cost per unit

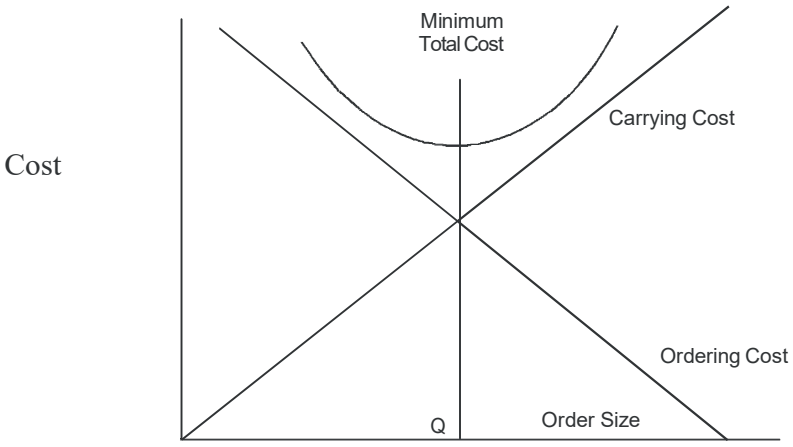


***Fig. 11.3** Economic Order Quantity*

Exercise 1

(a) Find out the economic order quantity and the number of orders per year fromthe following information:

Annual consumption: 36,000 unitsPurchase price per units: Rs. 54

Ordering cost per order: Rs. 150

Inventory carrying cost is 20% of the average inventory.

Solution

$$\text{Inventory} = \sqrt{\frac{2A}{C}O}$$

$A = 36{,}000$ units

$O = \text{Rs. } 150$

$C = 20\% \text{ of } 54 \times 10 \times 8$

$= 1{,}000$

$$EOQ = \sqrt{\frac{2 \times 36{,}000 \times 150}{}} \text{ units}$$

1,000 units

Exercise 2

From the following information calculate, (1) Re-order level (2) Maximum level (3) Minimum level (4) Average level Normal usage: 100 units per week Maximum usage: 150 units per week Minimum usage: 50 units per week Re-order quantity (EOQ) 500: units Log in time: 5 to 7 weeks

Solution

(1) Re-order Level

= Maximum consumption × Maximum Re-order period

$= 150 \times 7 = 1050$ units

(2) Maximum Level

= Re-order level + Re-order quantity – (Minimum consumption × Minimum delivery period)

$= 1050 + 500 - (50 \times 5) = 1300$ units

(3) Minimum Level

= Re-order level – (Normal consumption × Normal delivery period)

$= 1050 - (100 \times 6) = 450$ units

(4) Average Level

$$= \frac{\text{Maximum level + Minimum level}}{2}$$

$$= \frac{1300 + 450}{2} = 875 \text{ units.}$$

TECHNIQUES BASED ON THE CLASSIFICATION OF INVENTORIES

A-B-C analysis

It is the inventory management techniques that divide inventory into three categories based on the value and volume of the inventories; 10% of the inventory's item contributs to 70% of value of consumption and this category is known as A category. About 20% of the inventory item contributes about 20% of value of consumption and this category is called category B and 70% of inventory item contributes only 10% of value of consumption and this category is called C category.

Inventory Breakdown Between Value and Volume

Category	Volume (%)	Value (%)
A	10	70
B	20	20
C	70	10
Total	100	100

ABC analysis can be explained with the help of the following Graphical presentation.

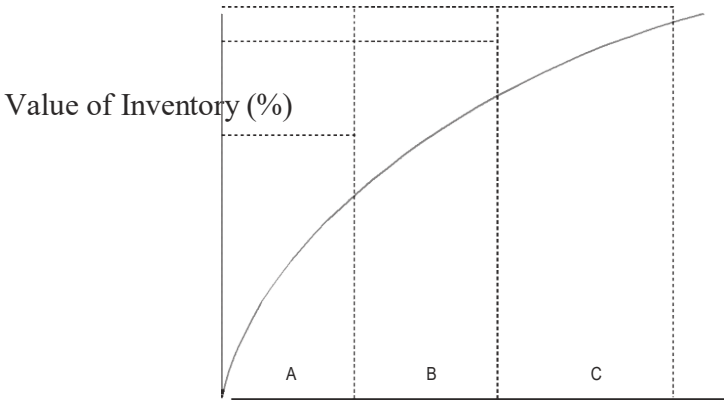


***Fig. 11.4** ABC Analysis*

Aging Schedule of Inventories

Inventories are classified according to the period of their holding and also this method helps to identify the movement of the inventories. Hence, it is also called as, FNSDanalysis—

where,

F = Fast moving inventories

N=Normal movinginventories S = Slow moving inventories D =Dead moving inventories

This analysis is mainly calculated for the purpose of taking disposal decisions of the inventories.

VED Analysis

This technique is ideally suited for spare parts in the inventory management like ABC analysis. Inventories are classified into three categories on the basis of usage of the inventories.

V = Vital item of inventories
E = Essential item of inventories D =Desirable item of inventories

HML Analysis

Under this analysis, inventories are classified into three categories on the basis of the valueof the inventories.

H = High value of inventories
M = Medium value of inventoriesL = Low value of inventories

TECHNIQUES ON THE BASIS OF RECORDS

A. Inventory budget

It is a kind of functional budget which facilitates the estimated inventory required for the business concern during a particular period. This budget is prepared based on the past experience.

B. Inventory reports

Preparation of periodical inventory reports provides information regarding the order level, quantity to be procured and all other information related to inventories. On the basis of these reports, Management takes necessary decision regarding inventory control and Management in the business concern.

Valuation of Inventories

Inventories are valued at different methods depending upon the situation and nature of manufacturing process. Some of the major methods of inventory valuation are mentionedas follows:

1. First in First Out Method (FIFO)
2. Last in First Out Method (LIFO)
3. Highest in First Out Method (HIFO)
4. Nearest in First Out Method (NIFO)
5. Average Price Method

6. Base Stock Method
7. Standard Price Method
8. Market Price Method

Exercise 3

From the particulars given below write up the stores ledger card : 1988 January 1,

Opening stock 1,000 units at Rs. 26 each.

5 Purchased	500 units at Rs. 24.50 each.
7 Issued	750 units.
10 Purchased	1,500 units at Rs. 24 each.
12 Issued	1,100 units.
15 Purchased	1,000 units at Rs. 25 each.
17 Issued	500 units.
18 Issued	300 units.
25 Purchased	1,500 units at Rs. 26 each.
29 Issued	1,500 units.

Adopt the FIFO and LIFO method of issue and ascertain the value of the closing stock.

CASH MANAGEMENT

Business concern needs cash to make payments for acquisition of resources and services for the normal conduct of business. Cash is one of the important and key parts of the current assets.

Cash is the money which a business concern can disburse immediately without any restriction. The term cash includes coins, currency, cheques held by the business concern and balance in its bank accounts. Management of cash consists of cash inflow and outflows, cash flow within the concern and cash balance held by the concern etc.

Motives for Holding Cash

1. **Transaction motive**
   It is a motive for holding cash or near cash to meet routine cash requirements to finance transaction in the normal course of business. Cash is needed to make purchases of raw materials, pay expenses, taxes, dividends etc.
2. **Precautionary motive**
   It is the motive for holding cash or near cash as a cushion to meet unexpected contingencies. Cash is needed to meet the unexpected situation like, floods strikes etc.

(A) *First in First out Method FIFO Method*

Date	Particulars Or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.
1998										
Jan. 1	Balance B/d							1,000	26.00	26,000
5	G.R.N. No.	500	24.50	12,250				1,000	26.00	26,000
								500	24.50	12,250
7	M.R. No.				750	26.00	19,500	250	26.00	6,500
								500	24.50	12,250
10	G.R.N. No.	1,500	24.00	36,000				250	26.00	6,500
								500	24.50	12,250
								1,500	24.00	36,000
					250	26.00	6,500			
					500	24.50	12,250			
					350	24.00	8,400	1,150	24.00	27,600
12	M.R. No.				1,100					
15	G.R.N No.	1,000	25.00	25,000				1,150	24.00	27,600
								1,000	25.00	25,000
17	M.R No.				500	24.00	12,000	650	24.00	15,600
								1,000	25.00	25,000
18	M.R. No.				300	24.00	7,200	350	24.00	8,400

								1,000	25.00	25,000
25	G.R.N. No.	1,500	26.00	39,000				350	24.00	8,400
								1,000	25.00	25,000
								1,500	26	39,000
					350	24.00	8,400			
					1,000	25.00	25,000			
					150	26.00	3,900	1,350	26.00	35,100
29	M.R. No				1,500					

Closing stock 1,350 units at Rs. 26 each = Rs. 35,100

Note : G.R.N. No. = Goods Received Note Number.

M.R. No. = Material Requisition Number.

(B) Last in first out method (LIFO)

Date	Particulars Or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.	Qty. Units	Rate Rs. P.	Amount Rs.
1998										
Jan. 1	Balance B/d							1,000	26.00	26,000
5	G.R.N. No.	500	24.50	12,250				1,000	26.00	26,000
								500	24.50	12,250
7	M.R. No.				750	26.00	19,500	250	26.00	6,500
								500	24.50	12,250
10	G.R.N. No	1,500	24.00	36,000				250	26.00	6,500
								500	24.50	12,250
								1,500	24.00	36,000
					250	26.00	6,500			
					500	24.50	12,250			
					350	24.00	8,400	1,150	24.00	27,600
12	M.R. No				1,100					
15	G.R.N. No	1,000	25.00	25,000				1,150	24.00	27,600
								1,000	25.00	25,000
17	M.R. No.				500	24.00	12,000	650	24.00	15,600
								1,00	25.0	25,000

								0	0	
18	M.R. No.				300	24.00	7,200	350	24.00	8,400
								1,000	25.00	25,000
25	G.R.N. No.	1,500	26.00	39,000				350	24.00	8,400
								1,000	25.00	25,000
								1,500	26.00	39,000
29	M.R. No.				1,500	26.00	39,000	750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000

Closing Stock = 1,350 units, valued at Rs. 34,100 (750×26+400×24+200×25)

Note : G.R.N. No. = Goods Received Note Number; M.R. No. = Material Requisition Number.

3. **Speculative motive**
   It is the motive for holding cash to quickly take advantage of opportunities typically outside the normal course of business. Certain amount of cash is needed to meet an opportunity to purchase raw materials at a reduced price or make purchase at favorable prices.
4. **Compensating motive**
   It is a motive for holding cash to compensate banks for providing certain services or loans. Banks provide variety of services to the business concern, such as clearance of cheque, transfer of funds etc.

Cash Management Techniques

Managing cash flow constitutes two important parts:

A. Speedy Cash Collections.
B. Slowing Disbursements.

Speedy Cash Collections

Business concern must concentrate in the field of Speedy Cash Collections from customers. For that, the concern prepares systematic plan and refined techniques. These techniques aim at, the customer who should be encouraged to pay as quickly as possible and the payment from customer without delay. Speedy Cash Collection business concern applies some of the important techniques as follows:

Prompt Payment by Customers

Business concern should encourage the customer to pay promptly with the help of offering discounts, special offer etc. It helps to reduce the delaying payment of customers and the firm can avoid delays from the customers. The firms may use some of the techniques for prompt payments like billing devices, sel`f address cover with stamp etc.

Early Conversion of Payments into Cash

Business concern should take careful action regarding the quick conversion of the payment into cash. For this purpose, the firms may use some of the techniques like postal float, processing float, bank float and deposit float.

Concentration Banking

It is a collection procedure in which payments are made to regionally dispersed collection centers, and deposited in local banks for quick clearing. It is a system of decentralized billing and multiple collection points.

Lock Box System

It is a collection procedure in which payers send their payment or cheques to a nearby post box that is cleared by the firm's bank. Several times that the bank deposit the cheque

in the firms account. Under the lock box system, business concerns hire a post office lock box at important collection centers where the customers remit payments. The local banks are authorized to open the box and pick up the remittances received from the customers. As a result, there is some extra savings in mailing time compared to concentration bank.

Slowing Disbursement

An effective cash management is not only in the part of speedy collection of its cash and receivables but also it should concentrate to slowing their disbursement of cash to the customers or suppliers. Slowing disbursement of cash is not the meaning of delaying the payment or avoiding the payment. Slowing disbursement of cash is possible with the help of the following methods:

1. **Avoiding the early payment of cash**
   The firm should pay its payable only on the last day of the payment. If the firm avoids early payment of cash, the firm can retain the cash with it and that can be used for other purpose.
2. **Centralised disbursement system**
   Decentralized collection system will provide the speedy cash collections. Hence centralized disbursement of cash system takes time for collection from our accounts as well as we can pay on the date.

Cash Management Models

Cash management models analyse methods which provide certain framework as to how the cash management is conducted in the firm. Cash management models are the development of the theoretical concepts into analytical approaches with the mathematical applications. There are three cash management models which are very popular in the field of finance.

1. Baumol model

The basic objective of the Baumol model is to determine the minimum cost amount of cash conversion and the lost opportunity cost.

It is a model that provides for cost efficient transactional balances and assumes that the demand for cash can be predicated with certainty and determines the optimal conversion size. Total conversion cost per period can be calculated with the help of the following formula:

$$t = \frac{Tb}{C}$$

where,

T= Total transaction cash needs for the period b = Cost per conversion

C = Value of marketable securities

Opportunity cost can be calculated with the help of the following formula;

$$i = \frac{C}{2}$$

where,

i = interest rate earned

C/2 = Average cash balance

Optimal cash conversion can be calculated with the help of the following formula;

$$C = \sqrt{\frac{2bT}{i}}$$

where,

C = Optimal conversion amount

b = Cost of conversion into cash per lot or transaction

T = Projected cash requirement

i = interest rate earned

2. Miller-Orr model

This model was suggested by Miller Orr. This model is to determine the optimum cash balance level which minimises the cost of management of cash. Miller-Orr Model can be calculated with the help of the following formula;

$$C = \frac{bE(N)}{t} + iE(M)$$

where,

C = Total cost of cash management

b = fixed cost per conversion

E(M) =expected average daily cash balance

E (N) = expected number of conversion

t = Number of days in the period

i = lost opportunity cost

3. Orgler's model

Orgler model provides for integration of cash management with production and other aspects of the business concern. Multiple linear programming is used to determine the optimal cash management.

Orgler's model is formulated, based on the set of objectives of the firm and specifing the set of constrains of the firm.

RECEIVABLE MANAGEMENT

The term receivable is defined as debt owed to the concern by customers arising from sale of goods or services in the ordinary course of business. Receivables are also one of the major parts of the current assets of the business concerns. It arises only due to credit sales to customers, hence, it is also known as Account Receivables or Bills Receivables.

Management of account receivable is defined as the process of making decision resulting to the investment of funds in these assets which will result in maximizing the overall return on the investment of the firm.

The objective of receivable management is to promote sales and profit until that point is reached where the return on investment in further funding receivables is less than the cost of funds raised to finance that additional credit.

The costs associated with the extension of credit and accounts receivables are identified as follows:

A. Collection Cost
B. Capital Cost
C. Administrative Cost
D. Default Cost.

Collection Cost

This cost incurred in collecting the receivables from the customers to whom credit sales have been made.

Capital Cost

This is the cost on the use of additional capital to support credit sales which alternatively could have been employed elsewhere.

Administrative Cost

This is an additional administrative cost for maintaining account receivable in the form of salaries to the staff kept for maintaining accounting records relating to customers, cost of investigation etc.

Default Cost

Default costs are the over dues that cannot be recovered. Business concern may not be able to recover the over dues because of the inability of the customers.

Factors Considering the Receivable Size

Receivables size of the business concern depends upon various factors. Some of the important factors are as follows:

1. Sales Level

Sales level is one of the important factors which determines the size of receivable of the firm. If the firm wants to increase the sales level, they have to liberalise their credit policy and terms and conditions. When the firms maintain more sales, there will be a possibility of large size of receivable.

2. Credit Policy

Credit policy is the determination of credit standards and analysis. It may vary from firm to firm or even some times product to product in the same industry. Liberal credit policy leads to increase the sales volume and also increases the size of receivable. Stringent credit policy reduces the size of the receivable.

3. Credit Terms

Credit terms specify the repayment terms required of credit receivables, depend upon the credit terms, size of the receivables may increase or decrease. Hence, credit term is one of the factors which affects the size of receivable.

4. Credit Period

It is the time for which trade credit is extended to customer in the case of credit sales. Normally it is expressed in terms of 'Net days'.

5. Cash Discount

Cash discount is the incentive to the customers to make early payment of the due date. A special discount will be provided to the customer for his payment before the due date.

6. Management of Receivable

It is also one of the factors which affects the size of receivable in the firm. When the management involves systematic approaches to the receivable, the firm can reduce the size of receivable.

Exercise 4

The board of directors of Aravind mills limited request you to prepare a statement showing the working capital requirements for a level of activity of 30,000 units of output for the year. The cost structure for the company's product for the above mentioned activity level is given below.

	Cost per Unit (Rs.)
Raw materials	20
Direct labour	5
Overheads	15
Total	40
Profit	10
	Selling price 50

(a) Past experience indicates that raw materials are held in stock, on an average for 2 months
(b) Work in progress (100% complete in regard to materials and 50% for labour and overheads) will be half a month's production.
(c) Finished goods are in stock on an average for 1 month.
(d) Credit allowed to suppliers: 1 month.
(e) Credit allowed to debtors: 2 months.
(f) A minimum cash balance of Rs 25,000 is expected to be maintained. Prepare a statement of working capital requirements.

Solution

Output per annum = 30,000 units
Output per annum = 12% of 30,000 = 2,500 units

Raw materials p. m. Rs. 20×2500 =	50,000
Labour p. m. Rs. 5×2,500 =	12,500
Overheads p. m. Rs. 15×2,500 =	37,500
	1,00,000

Statement of Working Capital Requirements

Particulars	Rs.	Rs.
Current assets		
Stock of raw materials (2 months) 50,000 x 2		1,00,000
Work-in-progress (1/2 months)		
Raw materials = 50,000 x ½	25,000	
Labour = 12,500 x ½ x 50/100	3,125	
Overheads = 37,500 x ½ x 50/100	9,375	
		37,500
Stock of finished goods (1 month) 1,00,000 x 1		1,00,000
Debtors (2 month) 1,00,000 x 2		2,00,000
Cash balance required		25,000
		4,62,500
Less: current liability		
Creditors (1 month) 50,000 x 1		50,000
(Working capital required)		4,12,500

Exercise 5

Prepare an estimate of working capital requirement from the following information of a trading concern.

Projected annual sales	10,000 units
Selling price	Rs. 10 per unit

Percentage of net profit on sales	20% Average credit period
allowed to customers	8 Weeks Average credit period
allowed by suppliers	4 Weeks Average stock holding
in terms of sales requirements	12 WeeksAllow 10% for
contingencies	

Solution

Statement of Working Capital Requirements

		Rs.
Current Assets		
Debtors (8 weeks)	$80{,}000 \times \frac{8}{52}$	12,307
Stock (12 weeks) (at cost)	$80{,}000 \times \frac{12}{52}$	18,462
		30,770
Less: Current Liability		
Credits (4 weeks)	$80{,}000 \times \frac{4}{52}$	6,154
		24,616
Add 10% for contingencies		2,462
Working Capital Required		**27,078**

Working Notes

Sales = 10000×10 = Rs. 1,00,000

Profit 20% of Rs. 1,00,000 = Rs. 20,000

Cost of Sales=Rs.1,00,000 – 20,000 = Rs. 80,000

As it is a trading concern, cost of sales is assumed to be the purchases.

Exercise 6

Prepare an estimate of working capital requirement from the following informations ofa trading concern.

Projected annual sales	Rs. 6,50,000
Percentage of net profit on sales	25%
Average credit period allowed to debtors	10 Weeks
Average credit period allowed by creditors	4 Weeks Average stock holding
in terms of sales requirements	8 Weeks Allow 20% for
contingencies	

(M.Com., M.S. University Nov. 2001)

Solution

Statement of Working Capital Requirements

Current Assets	Rs
Debtors (10 weeks) (at cost) $\frac{5,20,000 \times 10}{52}$	1,00,000
Stock (8 weeks) $\frac{5,20,000 \times 8}{52}$	80,000
	1,80,000
Less: Current Liability	
Credits (4 weeks) $\frac{5,20,000 \times 4}{52}$	40,000
	1,40,000
Add 20% for contingencies	28,000
(Working Capital Required)	**1,68,000**

Working Notes

Sales=Rs. 6,50,000

Profit 25/125 of Rs. 6,50,000 = Rs. 1,30,000

Cost of Sales=Rs. 6,50,000 –1,30,000=Rs. 5,20,000

As it is a trading concern, cost of sales is assumed to be the purchases.

Exercise 7

A Performa cost sheet of a company provides the following particulars:

Elements of cost	
Material	35%
Direct Labours	25%
Overheads	20%

Further particulars available are:

(i) It is proposed to maintain a level of activity of 2,50,000 units.

(ii) Selling price is Rs. 10/- per unit

(iii) Raw materials are to remain in stores for an average period of one month.

(iv) Finished foods are required to be in stock for an average period of one month.

(v) Credit allowed to debtors is 3 months.

(vi) Credit allowed by suppliers is 2 months.

You are required to prepare a statement of working capital requirements, a forecostprofit and loss account and balance sheet of the company assuring that

Share Capital	Rs. 12,00,000
10% Debentures	Rs. 3,00,000
Fixed Assets	Rs. 11,00,000

Statement of Working Capital

Particulars	Rs.	Rs.
Current Assets		
Stock of Raw Materials (1 Month)		
(5,00,000 x 35% x 1/12)		72,917
Work in process (1/2 months)		
Materials (25,00,000 x 35% x 1/24)	36,458	
Labour (25,00,000 x 25% x 1/24)	26,041	
Overheads (25,00,000 x 20% x 1/24)	20,833	83,332
Stock of finished goods (one month)		
Materials (25,00,000 x 35% x 1/12)	72,917	
Labour (25,00,000 x 25% x 1/12)	52,083	
Overheads (25,00,000 x 20% x 1/12)	41,667	1,66,667
Debtors (2 months) At cost		
Materials (25,00,000 x 35% x 3/12)	2,18,750	
Labour (25,00,000 x 25% x 3/12)	1,56,250	
Overheads (5,00,000 x 20% x 3/12)	1,25,000	5,00,000
		8,22,916
Less: Current liability		
Credits (2 Months) for raw materials		
25,00,000 x 35% x 2/12		1,45,833
Net working capital required		**6,77,083**

Forecast Profit and Loss Account

Dr.			**Cr.**
To Materials (25,00,000 x 35%)	8,75,000	By cost of goods sold	20,00,000
To Wages (25,00,000 x 25%)	6,25,000		
To Overheads (25,00,000 x 20%)	5,00,000		
	20,00,000		20,00,000
To Cost of goods sold	20,00,000	By Sales	25,00,000
To Gross profit	5,00,000		
	25,00,000		25,00,000
To Interest on debentures	30,000	By Gross profit	5,00,000
To Net profit	4,70,000		
	5,00,000		5,00,000

Forecast Balance Sheet

Liabilities	Rs.	Assets	Rs.
Share capital	12,00,000	Fixed Assets	11,00,000
Net profit	4,70,000	**Stock**	
10% debentures	3,00,000	Raw material	72,917
Credits	1,45,833	Work-in-process	38,458
		Finished goods	1,66,667
		Debtors	5,00,000
		Cash and Bank Balance	2,37,791
	21,15,833		21,15,833

Exercise 8

Selva and Co. desires to purchase a business and has consulted you and one point on which you are to advise them is the average amount of working capital which will be requiredin the first year's working.

You have given the following estimates and instructed to add 10% to your computed figure to allow for contingencies.

		Figures for the year
(i)	Amount blocked up for stocks:	
	Stocks of finished product	3,000
	Stocks of stores, materials, etc.,	5,000
(ii)	Average credit given:	
	Inland sales 4 weeks credit	26,000
	Export sales— 1½ weeks credit	65,000
(iii)	Lag in payment of wages and other outputs	
	Wages— 1½ weeks	2,40,000
	Stocks of materials, etc.— 1½ month	36,000
	Rent, Royalties, etc.—4 months	8,000
	Clerical staff— ½ month	60,000
	Manager— ½ month	4,000
	Miscellaneous expenses—1½ month	36,000
(iv)	Payment in advance	
	Sundry Expenses (paid quarterly in advance)	6,000
(v)	Undrawn profit on the average throughout the year	9,000

State your calculations for the average amount of working capital required.

Statement of Working Capital

Particulars	Rs.
Current Assets	
Stock of finished products	3,000
Stock of stores material, etc.	5,000
Sundry debtors	20,000
(a) Inland (4 weeks) 2,60,000 × 4/52	1,875
(b) Export Sales (1½ weeks) 65,000 × 1.5/12	21,875
	1,500
	31,375
Payments in advance 6,000 × ¼	6,923
Less: Lag in payment of wages (1½ weeks) 24,000 × 1.5/12	4,500
Stock, Materials etc. (1½ months) 8000 × 1.5/12	4,000
Rent, Royalties, etc. (6 months) 8000 × 6/12	7,500
Clerical staff (1½ month) 60,000 × 1.5/12	167
Manager (½ month) 4000 × .5/12	4,500
Miscellaneous Expenses (1½ months) 36,000 × 1.5/12	27,590
	3,785
	379
Net Working Capital	**4,164**
Add: 10% Margin for Contingencies	
Net working capital required	

Exercise 9

A performa cost sheet of a company provides the following particulars:

Elements of Cost	Amt. Per Unit (Rs.)
Raw Materials	140
Direct Labours	60
Overheads	70
Total Cost	270
Profit	30
Selling Price	300

Further particulars available are:

Raw materials are in stock on an average for one month. Materials are in process on an average for half a month. Finished goods are in stock on an average for one month.

Credit allowed by suppliers is one month – credit allowed to customers is two months. Lag in payment of wages is 1½ weeks. Lag in payment of overhead expenses is one month. One fourth of the output is sold against cash. Cash in hand and at bank is expected to be Rs. 50,000.

You are required to prepare a statement showing the working capital needed for a level of activity of 2,40,000 units of production. You may assume that production is carried on evenly throughout the year; wages and overhead accrue similarly and a time period of 4 weeks is equivalent to a month.

Note: Year = 4×12 = 48 weeks

Solution

Statement of Working Capital

Particulars	Rs.	Rs.
Current Assets		
(i) Stock of raw materials (4 weeks) 2,40,000 × 140/48 = 7,00,000 × 4		28,00,000
(ii) Work in process (2 weeks) Raw materials 7,00,000 × 2	14,00,000	
Direct labour 2,40,000 × 60/48 , 3,00,000 × 2	6,00,000	
Overheads 2,40,000 × 70/48	7,00,000	
350000 × 2	28,00,000	27,00,000
(iii) Stock of finished good (4 weeks)Raw Materials 7,00,000× 4 Direct Labour 30,000 × 4 Overheads 3,50,000 × 4	1,20,000 14,00,000 42,00,000 18,00,000	54,00,000
(iv) Sundry Debtors (8 weeks) Raw Materials 7,00,000 × 8 × 3/4	21,00,000	81,00,000
Direct Labour 3,00,000 × 8 × 3/4	28,00,000	50,000
Overheads 3,50,000 × 8 × 3/4	4,50,000	1,90,50,000
Cash in hand and at Bank	14,00,000	46,50,000
		1,44,00,000
(–) Current Liabilities		
(i) Sundry creditors (4 weeks) 7,00,000 × 4		
(ii) Wages Outstanding (1 1/2 weeks) 3,00,000 × 3/2		
(iii) Lag in payment of overhead (4 weeks) 3,50,000 × 4	–	
Net Working Capital required		

Exercise 10

Mr. Siva wishes to commerce a new trading business and gives the following informations.

(i) The total estimated sales in a year will be Rs. 20,00,000.

(ii) His expenses are estimated fixed Expenses of Rs. 3,000 per month plus variable expenses equal to 10% of his turnover.

(iii) He expects to fix a sales price for each product which will be 33 1/3% in excess of his cost of purchase.

(iv) He expects to turnover his stock six times in a year.

(v) The sales and purchases will be evenly spread throughout the year. All sales willbe for cash but he expects one month's credit for purchases.

Calculate

(i) His estimated profit for the year.

(ii) His average working capital requirements.

Solution

(i) Estimated profit of Mr. Siva for the year

Sales	20,00,000	
(–) Gross Profit (20,00,000 × $33\frac{1}{3}$ / $133\frac{1}{3}$)	5,00,000	
Cost of goods sold		15,00,000
Gross Profit		5,00,000
(–) Expenses		
Fixed (3,000×12)	36,000	
Variable 20,00,000×10/100	2,00,000	
	2,36,000	
Net Profit	2,64,000	

(ii) Statement of working capital

Particulars	**Rs.**
Current Assets	
Stock	2,50,000
Turnover of stock is 6 times	
Stock Turnover = Cost of goods sold / Average stock at cost	
$6 = \frac{15,00,000}{\text{Average stock at cost}}$	
6 × Average stock at cost = 15,00,000	
Average stock at cost = $\frac{15,00,000}{6}$ = 2,50,000	
Cash	
To meet fixed expenses = 3,000	
To meet variable expenses	
$20,00,000 \times \frac{10}{100} \times \frac{1}{12} = 16,667$	
Debtors (as all sales are for cash only)	19,667
Less: Current Liabilities:	2,69,667
Creditors (1 months)	1,25,000
$15,00,000 \times \frac{1}{12}$	
Working capital required	**1,44,667**

From the informations given below, you are required to prepare a projected balancesheet, profit and loss account and then an estimate of working capital requirements.

(a)	Issued share capital	5,00,000
	6% debentures	2,50,000
	Fixed Assets at cost	2,50,000
(b)	The expected ratios to selling price are	
	Raw materials	45%
	Labour	20%
	Overheads	15%
	Profit	20%

(c) Raw materials are kept in store for an average of 1-$\frac{1}{2}$ months.

(d) Finished goods remain in stock for an average period of 2 months.

(e) Production during the previous year was 2,40,000 units and it is planned to maintain the rate in the current year also.

(f) Each unit of production is expected to lag in process for half a month.

(g) Credit allowed to customers is two months and given by suppliers is one month.

(h) Selling price is Rs. 6 per unit.

(i) There is a regular production and sales cycle.

(j) Calculation of debtors may be made at selling price.

Solution

		Rs.
(i)	Calculation of sales	
	Total Sales = 2,40,000×6	14,40,000
(ii)	Calculation of Amount blocked in inventories.	
	(a) Stock of Raw Material	
	$1,44,000 \times \frac{45}{100} \times \frac{1.5}{12}$	81,000
	(b) Stock of finished goods at cost (Material + Labour + Overheads)	
	$1,44,000 \times \frac{80}{100} \times \frac{2}{12}$	1,92,000

(c) Work-in-progress at cost

(Material + Labour + Overheads)

$144000 \times \frac{80}{100} \square \frac{.5}{12}$ — 48,000

(iii) Calculation of Amount locked up in Debtors Total sales 14,40,000

$\text{Debtors} = \frac{14,40,000 \times \frac{2}{12}}{}$ 2,40,000

(at selling price, as given)

(iv) Calculations of creditors (For Raw Materials) 6,48,000

$\text{Total Purchases} = 14,40,000 \times \frac{45}{100}$ 54,000

$\text{Creditors} = 6,48,000 \times \frac{1}{12}$

Projected profit and loss account

To	Cost of Goods sold :		By Sales	14,40,000
To	Raw Materials	6,48,000		
To	Labour	2,88,000		
To	Overheads	2,16,000		
To	Gross Profit	2,88,000		
		14,40,000		14,40,000
To	Interest on Debentures	15,000	By Gross Profit	2,88,000
To	Net Profit	2,73,000		
		2,88,000		2,88,000

Projected balance sheet

Liability	Rs.	Assets	Rs.	Rs.
Share Capital	5,00,000	Fixed Assets (at cost)		2,50,000
6% Debentures	2,50,000	Current Assets		
Profit and Loss A/c	2,73,000	Stock	81,000	
Creditors	54,000	Work in Process	48,000	
		Finished Goods	1,92,000	

		0 Debtors	2,40,00	
		0		5,61,000
		Cash and Bank (Balance for)		2,66,000
	10,77,000			10,77,000

Exercise 12

V.S.M. Ltd. is engaged in large scale retail business. From the following informations you are required to forecast their working capital requirements.

Projected Annual Sales Rs. 130 lakhs Percentage of net profit on cost of sales 25% Average credit period allowed to debtors 8 weeks.

Average credit period allowed by creditors 4 weeks.

Average stock carrying 8 weeks (in terms of sales requirements). Add : 10% to computed figures to allow for contingencies.

(MBA/MK Uni. May 2005)

Solution

Sales	1,30,00,000
Gross profit 25% of sales	32,50,000
Cost of goods sold	97,50,000

Statement showing working capital

Particulars	Rs.
Current Assets	
(i) Debtors ($97,50,000 \times \frac{8}{52}$)	15,00,000
(ii) Stock ($97,50,000 \times \frac{8}{52}$)	15,00,000
Total current assets	30,00,000
(–) Current Liabilities	
Creditors ($97,50,000 \times \frac{4}{52}$)	7,50,000
Net working capital	22,50,000
Add: Contingencies 10%	2,25,000
Net Working Capital Required	24,75,000

Exercise 13

Prepare an estimate of working capital requirements.

(i) Projected annual sales—80,000 units.
(ii) Selling price Rs. 8 per unit.
(iii) Percentage of profit 20%.
(iv) Credit allowed to debtors—10 weeks.
(v) Credit allowed to suppliers—8 weeks.
(vi) Average stock holding (in terms of sales)—10 weeks.
(vii) Allow 20% for contingencies.

(MFM/Bharathidasan AP, 2002)

Solution

Sales	80,000 Units
Selling Price	Rs. 8
Total sales in	Rs. 6,40,000
Sales	Rs. 6,40,000
Profit 20% of sales	1,28,000Cost of Goods Sold
	5,12,000

Statement of Working Capital

Particulars	Rs.
Current Assets	
i. Debtors (5,12,000 x $\frac{10}{52}$)	98,462
ii. Stock (5,12,000 x $\frac{10}{52}$)	98,462
Total Current Assets	1,96,924
Less: Current Liabilities	
Creditors (5,12,000 x $\frac{8}{52}$)	78,769
Net Working Capital	1,18,155
Add : Contingencies 20%	23,631
Net Working Capital Required	**1,41,786**

Cash Management

Exercise 14

A Company expects to have Rs. 37500 cash in hand on 1st April, and requires you toprepare an estimate of cash position during the three months.

April, May and June the following information is supplied to you:

Month	Sales Rs.	Purchases Rs.	Wages Rs.	Factory Expenses Rs.	Office Expenses Rs.	Selling Expenses Rs.
Feb	75,000	45,000	9,000	7,500	6,000	4,500
March	84,000	48,000	9,750	8,250	6,000	4,500
April	90,000	52,500	10,500	9,000	6,000	5,250
May	1,20,000	60,000	13,500	11,250	6,000	6,570
June	1,35,000	60,000	14,250	14,000	7,000	7,000

Other Information:

(i) Period of credit allowed suppliers 2 months.

(ii) 20% of sales for cash and period of credit allowed to customers for credit is one month.

(iii) Delay in payment of all expenses:1 month.

(iv) Income tax of Rs. 57,500 is due to be paid on June 15th.

(v) The company is to pay dividend to shareholders and bonus to workers of Rs. 15,000 and Rs. 22,500 respectively in the month of April.

(vi) A plant has been ordered to be received and paid in May. It will cost Rs. 1,20,000.

(Periyar University M.Com., Nov. 2005)

Cash Budgets of April, May, June

Particulars	April	May	June
Opening Balance b/d	37,500	10,950	
Sales (i) Cash 20%	18,000	24,000	27,000
(ii) Credit sales (One month)	67,200	72,000	96,000
Total Receipts (A)	**1,22,700**	**1,06,950**	**1,23,000**
Payments :			
Purchase	45,000	48,000	52,500
Wages	10,500	13,500	14,250
Factory Expenses	8,250	9,000	11,250
Office Expenses	6,000	6,000	6,000
Selling Expenses	4,500	5,250	6,570
Income Tax	–	–	57,500
Dividend to Shareholders	15,000	–	–
Bonus to workers	22,500	–	–
Plant Cost	–	1,20,000	–
Total Payments (B)	1,11,750	2,01,750	1,48,070
Balance c/d (A-B)	10,950	(–)94,800	(–)25,070
Bank Overdraft	–	(+)94,800	(+)25,070

Assumed that the company has arranged overdraft facility.

Receivable Management

Exercise 15

A Company's collection period pattern is as follows:

- 10% of sales in the same month
- 20% of sales in the second month
- 40% of sales in the third month
- 30% of sales in the fourth month

The sales of the company for the first three quarters of the year are as follows:

Month	Quarter I	Quarter II	Quarter III
First	15,000	7,00	22,500
Second	15,000	15,000	15,000
Third	15,000	22,500	7,500
	45,000	45,000	45,000

Working Days	90	90	90

You are required to calculate the average age of receivables and comment upon the results.

(MFM/Bharathidasan University AP 2001)

Solution

The collection period of the company's policy indicates that the outstanding receivables at the end of each month will consist of 90% of the month's sales, 70% of the previous month's sales and 30% of the sales made two months earlier.

Statement of Accounts receivable and their age.

Sales	I Quarter	II Quarter	III Quarter
30% 1st Month	4,500	2,250	6,750
70% 2nd Month	10,500	10,500	10,500
90% Per Month	13,500	20,250	6,700
	28,500	33,000	24,000

Average of receivable is = $\frac{\text{Accounts receivable (Debtors)}}{\text{Sales}} \times \text{No. of working days}$

$$= \frac{28,500}{45,000} \times 90 \qquad \frac{33,000}{45,000} \times 90 \qquad \frac{24,000}{45,000} \times 90$$

= 57 Days 66 Days 48 Days

The average age of receivable is affected because of sales is fluctuation.

MODEL QUESTIONS

1. Discuss the objectives of inventories.
2. Explain various inventory control techniques.
3. What are the techniques of classification of inventory?
4. Explain the motives of holding cash.
5. Discuss the cash management techniques.
6. What is receivable management? Explain it.
7. S Ltd. is engaged in large-scale retail business. From the following particulars you are required to calculate the working capital requirement.

   Project annual sales Rs. 208 lakhs

   % of net profit on cost of sales $33\frac{1}{3}\%$

Average credit period allowed to Drs. 6 weeks Average credit period allowed to Crs. 3 weeks Average stock (in term of sales) 6 weeks Add 10% to allow for contingencies.

(**Ans.** 29.7 lakhs)

8. The following details relating to Mr. Santosh want to start trading business. You are required to calculate.
(a) Estimate profit.
(b) Working capital requirements.

Estimate annual sales	–	Rs. 12,00,000
Expected profit on purchase	–	$33\frac{1}{3}\%$
Fixed expenders Rs. 3,000 pm. of which Depreciation amounts to Rs. 600 and variable Expenders chargeable to PLL a/c equal 8% of sales.		
Stock term over	–	6 times Sales and purchases will occur evenly throughout the year Creditors allowed 1 month credit Debtors allowed 2 months credit 30% of cash sales.

(**Ans.** (a) Net Profit Rs. 1,68,000 (b) Working capital Rs. 32,25,400)

9. Calculate the working capital from the following particulars:

		Rs.
(a)	Annual Expenses:	
	Wages	52,000
	Stores and Material	9,600
	Office Salaries	12,480
	Rent	2,000
	Other Expenses	9,600
(b)	Average amount of stock to be maintained:	
	Stock of finished goods	1,000
	Stock of materials and stores	1,600
	Expenses paid in advance:	
	Quarterly advance	1,600 p.a.
(c)	Annual Sales	
	Home Market	62,400
	Foreign Market	15,600

(d) Lag in payment of

expenses: Wages	$1\frac{1}{2}$ weeks
Stores and Material	$1\frac{1}{2}$ months
Office Salaries	$1\frac{1}{2}$ months
Rent	6 months
Other Expenses	$1\frac{1}{2}$ months

(e) Credit allowed to customers :

Home Market	6 weeks
Foreign Market	$1\frac{1}{2}$ weeks

(M.Com. Rajasthan)

(**Ans.** 5,230)

10. Arvind Ltd. supplies the following informations for calculating the working capital firm levels of activity of Rs. 2,40,000 units. The cost structure particulars are:

	Cost Per Unit
	Rs.
Raw materials	30
Direct labour	10
over-heads	20
Total	60
Profit	15
Selling price	75

(a) Raw materials are in store on average for 1 month.

(b) Work in process (100% complete in regard to materials and 50% for labourand overheads for half a month's production.

(c) Finished goods remain in godown on average for a month.

(d) Suppliers one month to customers 2 months (calculation of customers maybe made on selling price).

(e) Minimum cash balance required is Rs, 30,000.

(f) The production is evenly throughout the year.

(**Ans.** Rs. 46,80,000)

11. The Board of Directors of Nanak Engineering Company Private Ltd. request you to prepare a statement showing the working Capital Requirements for a level of activity of Rs. 1,56,000 units of production.

The following informations are available for your calculations:

(A)

	Per unit (Rs.)
Raw Materials	90
Direct Labour	40
Overheads	75
	205
Profit	60
Selling price per unit	265

(B)

(i) Raw materials are in stock, on average one month.
(ii) Materials are in process, on average 2 weeks.
(iii) Finished goods are in stock, on average one month.
(iv) Credit allowed by suppliers, one month.
(v) Time lag in payment from debtors, 2 months.
(vi) Lag in payment of wages, $1\frac{1}{2}$ weeks.
(vii) Lag in payment of overheads is one month.

20% of the output is sold against cash. Cash in hand and at bank is expectedto be Rs. 60,000. It is to be assumed that production is carried on evenlythroughout the year; wages and overheads accrue similarly and a time periodof 4 weeks is equivalent to a month. **(C.A. Final)** (**Ans.** 66,06,000)

12. A company Ltd. supplies the following cost sheet:Element of cost

Raw material	—	45%
Labour	—	15%
Overheads	—	25%The following further

particulars are available.

(i) Raw materials remain in shares 5 weeks.
(ii) Cash in processing 4 weeks.
(iii) Finished goods in own house 6 weeks.
(iv) Credit period to customers 8 weeks supplie 4 weeks.
(v) Lag in payment wages 2 weeks.
(vi) Selling price per unit Rs. 60.

You are required to prepare the working capital requirements adding 15% for contribution in all levels of activity of 1,04,000 units of production made during the period.

(**Ans.** Rs. 20,17,100)

Note: Debtors, calculate on the basis of cost.

13. On 1 April the director of XYZ Ltd. wants to know the amount of working capital required for the fourth coming year. Prepare a working capital and for cost the Balance sheet.

Issued share capital — Rs. 3,00,000 6% Debentures (floating charge on assets) — Rs. 1,00,000 Fixed assets — Rs. 1,50,000

Production during the previous year — 72,000 units Same level should continue during the current year.

The following is the cost sheet:

Raw materials	—	40%.
Directs	—	15%
Overheads	—	25%

Raw materials are to remain in stock for 1 month, within process half a month, finished goods in warehouse for two months.

Credit allowed to debtors 2 months and creditors 1 month. Selling price Rs. 8.

Work-in-process may be assumed to be 100%.

Complete in materials, one 50% complete in direct ways and overheads.

(**Ans.** W/C Rs. 1,72,800; NP 1,09,200; B/S 4,00,000; Rs. 58,000 cash/bank balancing figure)