

MANAGEMENT OF FINANCES

Edited By

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Printed by
EXCEL BOOKS PRIVATE LIMITED
A-45, Naraina, Phase-I,
New Delhi-110028
for
Lovely Professional University
Phagwara

SYLLABUS

Management of Finances

Objectives: To train the student in the conceptual and practical aspects of finance function in business.

To make students understand various types of decisions taken by a business organization in the area of finance.

Sr. No.	Description
1	Meaning, Objectives and Scope of Financial Management; **Finance Functions:** Investment, Financing, Liquidity and Dividend Decisions.
2	**Sources of Finance:** Evaluation of Short term and long term source of finance.
3	Concept of Time Value of Money.
4	**Cost of Capital:** Concept and its significance, measurement of cost of capital of various sources of funds, Weighted Average cost of capital using book value weights and market value weights.
5	**Capital Budgeting:** meaning, importance, Risk and uncertainty, Estimation of Project Cash Flows, Discounting and non-discounting techniques of Capital Budgeting, Concept of Capital Rationing.
6	**Capital Structure Decision:** Understanding debt and equity, theories of Capital Structure, Optimum Capital Structure
7	**Leverage:** Operating, Financial Leverage and combined leverage, indifferent point
8	**Dividend Decisions:** Dividend Policy; Forms of dividend, Theories of dividend, Factors affecting dividend decisions
9	**Working Capital:** Concept, operating and cash cycle, Determinants working capital requirements, Overview of management of cash
10	Inventory Management, Receivables Management Capital Markets and Financial Institutions

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Unit 1: Introduction to Financial Management

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Objectives

After studying this unit, you will be able to:

- Recognize the meaning and scope of financial management;
- Describe the goals and objectives of financial management;
- Explain the different finance functions;
- Discuss various significant aspects related to financial management.

Introduction

Finance can be defined as the art and science of managing money. Virtually, all individuals and organizations earn or raise money and spend or invest money. Finance is concerned with the process, institutions, markets and instruments involved in the transfer of money among individuals, business and governments.

Notes

1. 1 Meaning and Scope of Financial Management

Financial management as an academic discipline has undergone fundamental changes with regard to its scope and coverage. In the earlier years, it was treated synonymously with the raising of funds. In the later years, its broader scope, included in addition to the procurement of funds, efficient use of resources.

1.1.1 Scope of Financial Management

Financial Management is broadly concerned with the acquisition and use of funds by a business firm. The important tasks of financial management, as related to the above, may be categorized as follows:

- Financial Analysis, Planning and Control
- Analysis of financial condition and preference
- Profit planning
- Financial forecasting
- Financial control

1.1.2 Important Topics in Financial Management

Table 1.1: Balance Sheet and Topics in Financial Management

Share Capital Equity Preference Reserves and Surplus Debentures	← Capital Structure and Cost of Capital
Unsecured Loan Current Liabilities & Provisions Trade Creditors Provisions	← Working Capital Financing Policy
Fixed Assets (Net) Gross Block Less Depreciation	← Capital Budgeting
Investment	← Security Analysis
Current Assets, Loans and Advances Cash and bank balances	← Cash Management
Receivables	← Receivables Management
Inventories	← Inventory Policy
Loans and Advances	
Miscellaneous Expenditure and Losses	

Notes

Table 1.2: Income Statement and Topics in Financial Management

Net Sales	← Revenue risk
Cost of goods Sold	
Materials and stocks	
Wages and Salaries	
Other Manufacturing Expenses	
Gross Profit	← Gross profit margin
Operating Expenses	
Selling and Administration Expenses	
Depreciation	← Depreciation Policy
Operating Profit	
Non-operating surplus/deficit	
Earnings before interest and tax	← Business risk
Interest	← Financial risk
Profit before tax	
Tax	← Tax planning
Profit after tax	← Return on equity
Dividends	← Dividend policy
Retained Earnings	

Self Assessment

Fill in the blanks:

1. In the earlier years, financial management was treated synonymously with the …… .
2. Financial management broader scope includes efficient use of resources in addition to the …… .
3. Current liabilities are associated with …… financing policy.
4. …… profit margin is obtained by deducting cost of goods sold from net sales.

1.2 Goals/Objectives of Financial Management – Profit Maximization vs. Wealth Maximization

Traditional Approach – Profit Maximization

It has been traditionally argued that the objective of a company is to earn profit. This means that the finance manager has to make decision in a manner that the profit is maximised. Each alternative, therefore, is to be seen as to whether or not it gives maximum profit.

Profit maximization objective gives rise to a number of problems as below:

1. Profit maximization concept should be considered in relation to risks involved. There is a direct relationship between risk and profit. Many risky propositions yield high profit.

Notes

Higher the risk, higher is the possibility of profits. If profit maximization is the only goal, then risk factor is altogether ignored.

2. Profit maximization, as an objective does not take into account time pattern of return.



Example: Proposal A may give a higher amount of profits compared to proposal B, yet if the returns begin to flow say, 10 years later, proposal B may be preferred, which may have lower overall profits but the returns flow is more early and quick.

3. Profit maximization, as an objective is too narrow. It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society as well as ethical trade practices. Further, most business leaders believe that adoption of ethical standards strengthen their competitive positions.

4. Profits do not necessarily result in cash flows available to the stockholder. Owners receive cash flow in the form of either cash dividends paid to them or proceeds from selling their shares for a higher price than paid initially.

Modern Approach – Wealth Maximization

The alternative to profit maximization is wealth maximization. This is also known as Value maximization or Net Present Worth maximization. Value is represented by the market price of the company's equity shares. Prices in the share market at a given point of time, are the result of many factors like general economic outlook, particularly if the companies are under consideration, technical factors and even mass psychology. However, taken on a long-term basis, the share market prices of a company's shares do reflect the value, which the various parties put on a company. Normally, the value is a function of two factors:

1. The likely rate of Earnings Per Share (EPS) of a company and

2. The capitalization rate

EPS are calculated by dividing the periods total earnings available for the firm's common shares by the number of shares of common shares outstanding. The likely rate of earnings per share (EPS) depends on the assessment as to how profitably a company is going to operate in the future.



Caution The capitalisation rate reflects the liking of the investors for a company.

If the company earns a higher rate of earning per share through risky operations or risky financing pattern, the investors will not look upon its shares with favour. To that extent, the market value of the shares of such a company will be low. If a company invests its fund in risky ventures, the investors will put in their money if they get higher return as compared to that from a low risk share.

The market value of a firm is a function of the earning per share and the capitalisation rate.



Example: Suppose the earning per share is expected to be ₹ 7 for a share, and the capitalisation rate expected by the shareholder is 20 per cent, the market value of the share is likely to be

$$\frac{7}{20\%} = \frac{7 \times 100}{20} = ₹\ 35$$

Notes

This is so because at this price, the investors have an earning of 20%, something they expect from a company with this degree of risk.

The important issues relating to maximizing share prices are Economic Value Added (EVA) and the focus on stakeholders.



Notes Economic Value Added (EVA) is a popular measure used by many firms to determine whether an investment – proposed or existing – contribute positively to the owner's wealth. EVA is calculated by subtracting, the cost of funds used to finance or investment from its after-tax-operations profits. Investments with positive EVA increase shareholder value as those with negative EVA reduce shareholders value.



Example: The EVA of an investment with after tax operations profits of ₹ 510,000 and associated financing costs of ₹ 475,000 would be ₹ 35,000 (i.e. ₹ 410,000 – 375,000). Because this EVA is positive, the investment is expected to increase owner's wealth and is, therefore, acceptable.

What about Stakeholders?

Stakeholders are groups such as employees, customers, suppliers, creditors, owners and others who have a direct economic link to the firm. A firm with a stakeholder focus, consciously avoids actions that would prove detrimental to stakeholders. The goal is not to maximize stakeholder well being but to preserve it. It is expected to provide long-run benefit to shareholders by maintaining positive stakeholder relationships. Such relationship should minimize stakeholder turnover, conflicts and litigation. Clearly, the firm can better achieve its goal of shareholder wealth maximization by maintaining cooperation with other stakeholders rather than having conflict with them.



Did u know? Besides the above basic objectives, the following are the other objectives of financial management:

1. Building up reserves for growth and expansion.
2. Ensuring maximum operational efficiency by efficient and effective utilization of finance.
3. Ensuring financial discipline in the management.

Role of Ethics

Ethics is standards of conduct or moral judgment. Today, the business community in general and the financial community in particular are developing and enforcing ethical standards, purpose being to motivate business and market participants to adhere to both the letter and the spirit of laws and regulations concerned with business and professional practice. An effective ethics programme is believed to enhance corporate value. An ethics programme can reduce potential litigation and judgment costs, maintain a positive corporate image, and build shareholders' confidence, and gain the loyalty, commitment and respect of the firms stakeholders. Such actions, by maintaining and enhancing cash flow and reducing perceived risk, can positively affect the firm's share prices. Ethical behaviour is, therefore, viewed as necessary for achieving the firm's goal of owner wealth maximization.

Notes

Self Assessment

Fill in the blanks:

5. There is a …….. relationship between risk and profit.
6. …….. is also known as Value maximization or Net Present Worth maximization.
7. A firm with a stakeholder focus, consciously avoids actions that would prove …….. to stakeholders.
8. Ethics programme reduces potential litigation and …….. costs and gain the loyalty, commitment and respect of the firms stakeholders.

1.3 Finance Functions

Financial Management is indeed, the key to successful business operations. Without proper administration and effective utilization of finance, no business enterprise can utilize its potentials for growth and expansion.

Financial management is concerned with the acquisition, financing and management of assets with some overall goals in mind. In the contents of modern approach, the discussions on financial management can be divided into three major decisions viz., (1) Investing; (2) Financing; and (3) Dividend decision. A firm takes these decisions simultaneously and continuously in the normal course of its business. Firm may not take these decisions in a sequence, but decisions have to be taken with the objective of maximizing shareholders' wealth.

Investing

(a) Management of current assets (cash, marketable securities, receivables and inventories)

(b) Capital budgeting (identification, selection and implementation of capital projects)

(c) Managing of mergers, reorganizations and divestments

Financing

(a) Identification of sources of finance and determination of financing mix

(b) Cultivating sources of funds and raising funds

Dividend Decision

This is the third financial decision, which relates to dividend policy. Dividend is a part of profits, that are available for distribution, to equity shareholders. Payment of dividends should be analyzed in relation to the financial decision of a firm. There are two options available in dealing with the net profits of a firm, viz., distribution of profits as dividends to the ordinary shareholders' where, there is no need of retention of earnings or they can be retained in the firm itself if they require, for financing of any business activity. But distribution of dividends or retaining should be determined in terms of its impact on the shareholders' wealth. The Financial manager should determine optimum dividend policy, which maximizes market value of the share thereby market value of the firm. Considering the factors to be considered while determining dividends is another aspect of dividend policy.

1.3.1 Place of Finance Function in the Organizational Structure

Notes

The finance function is almost the same in most enterprises. The details may differ but the important features are universal in nature. The finance function occupies such a major place that it cannot be the sole responsibility of the executive. The important aspects of the finance function have to be carried on by the top management i.e., the Managing Director and the Board of Directors. It is the Board of Directors, which makes all the material final decisions involving finance.

Financial management in many ways is an integral part of the jobs of managers who are involved in planning, allocation of resources and control. The responsibilities for financial management are disposed throughout the organization.



Examples:

1. The engineer, who proposes a new plant, shapes the investment policy of the firm.
2. The marketing analyst provides inputs in the process of forecasting and planning.
3. The purchase manager influences the level of investment in inventories.
4. The sales manager has a say in the determination of receivable policy.
5. Departmental managers, in general, are important links in the financial control system of the firm.

The Chief Financial Officer (CFO) is basically to assist the top management. He has an important role to contribute to good decision-making on issues that involve all the functional areas of the business. He must clearly bring out financial implications of all decisions and make them understood.

CFO (his designation varies from company to company) works directly under the President or the Managing Director of the company. Besides routine work, he keeps the Board of Directors informed about all the phases of business activity, including economic, social and political developments affecting the business behaviour. He also furnishes information about the financial status of the company by reviewing from time-to-time. The CFO may have different officers under him to carry out his functions. Broadly, the functions are divided into two parts.

1. Treasury function
2. Control function

Treasury function (headed by financial manager) is commonly responsible for handling financial activities, such as financial planning and fund raising, making capital expenditures decisions, managing cash, managing credit activities, managing the pension fund and managing foreign exchange.

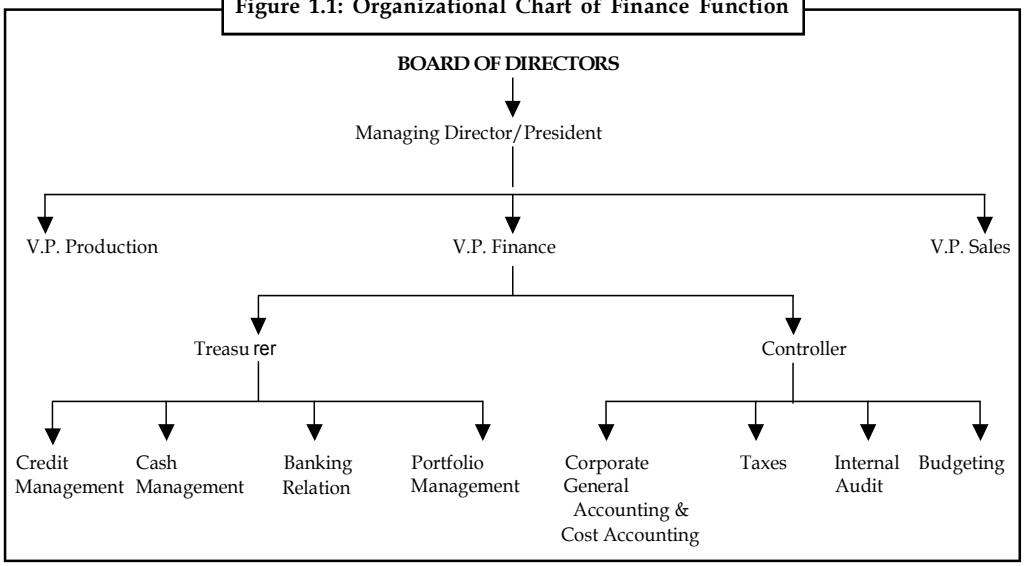


Notes The control function (headed by Chief Accountant/Financial Controller) typically handles the accounting activities such as corporate accounting, tax management, financial accounting and cost accounting.

Notes

The treasurer's focus tends to be more external, the controllers' focus is more internal:

Figure 1.1: Organizational Chart of Finance Function



1.3.2 Relation of Finance with Economics

The field of finance is closely related to economics. Financial managers must be able to use economic theories as guidance for efficient business operation.

Example: supply-demand analysis, profit-maximizing strategies, and price theory.

The primary economic principle used in managerial function is marginal analysis, the principle that financial decisions should be made and actions taken only when the added benefits exceed the added costs. Nearly all financial decisions ultimately come down to an assessment of their marginal benefits and marginal costs.

Caution Financial managers must understand the economic framework and be alert to the consequences of varying levels of economic activity and changes in economic policy.

1.3.3 Relation to Accounting

The firm's finance (treasurer) and accounting (controller) activities are closely related and generally overlapped. Normally, managerial finance and accounting are not often easily distinguishable. In small firms, the controller often carries out the finance function and in large firms many accountants are also involved in various finance activities. There are two basic differences between finance and accounting:

1. ***Emphasis on cash flows:*** The accountant's primary function is to develop and report data for measuring the performance of the firm, assuming its financial position and paying taxes using certain standardized and generally accepted principles. The accountant prepares financial statements based on accrual basis. The financial manager places primary emphasis on cash flows, the inflow and outflow of cash.
2. ***Relating to decision-making:*** Accountants devote most of their operation to the collection and presentation of financial data. The primary activities of the financial manager in

Notes

addition to ongoing involvement in financial analysis and planning are making investment decisions and making financing decisions. Investment decisions determine both the mix and the type of assets held by the firm. Financing decisions determine both the mix and the type of financing used by the firm. However, the decisions are actually made on the basis of cash flow effects on the overall value of the firm.

1.3.4 Interface with other Functions

Finance is defined as the lifeblood of an organization. It is a common thread, which binds all the organizational functions as each function when carried out creates financial implications. The interface between finance and other functions can be described as follows:

Manufacturing Finance

1. Manufacturing function necessitates a large investment. Productive use of resources ensures a cost advantage for the firm.
2. Optimum investment in inventories improves profit margin.
3. Many parameters of the production cost having effect on production cost are possible to control through internal management thus improving profits.
4. Important production decisions like make or buy can be taken only after financial implications have been considered.

Marketing Finance

1. Many aspects of marketing management have financial implications e.g., hold inventories to provide off the shelf service to customers and thus increase sales; extension of credit facility to customers to increase sales.
2. Marketing strategies to increase sales have additional cost impact, which needs to be weighed carefully against incremental revenue.

Personnel Finance

In the global competitive scenario, business firms are moving to leaner and flat organizations. Investments in Human Resource Development are also bound to increase. Restructuring of remuneration structure, voluntary retirement schemes, sweat equity etc., has become major financial decisions in the area of human resource management.



Task Which of the following functions should be the responsibility of a finance manager?

(a) Maintaining the books of account.

(b) Negotiating loans with banks.

(c) Conducting of internal audit.

(d) Deciding about change in the policies regarding recruitment.

(e) Change in marketing and advertising techniques routine.

Notes

Strategic Planning – Finance

Finance function is an important tool in the hands of management for strategic planning and control on two counts:

1. The decision variables when converted into monetary terms are easier to grasp.
2. Finance function has strong inter-linkages with other functions. Controlling other functions through finance route is possible.

Self Assessment

Fill in the blanks:

9. Financial management can be divided into three major decisions which are investing; Financing; …… and decision.
10. Identification of sources of finance and determination of financing mix is a part of …… decision.
11. Finance is defined as the …… of an organization.
12. …… decisions determine both the mix and the type of assets held by the firm.

1.4 Supplementary Noteworthy Aspects Related to Financial Management

Modern financial management has come a long way from the traditional corporate finance.

The finance manager is working in a challenging environment, which changes continuously. As the economy is opening up and global resources are being tapped, the opportunities available to finance manager have no limits. At the same time one must understand the risk in the decisions. Financial management is passing through an era of experimentation and excitement, as a large part of the finance activities carried out today were not heard of a few years ago.

A few instances are enumerated below:

1. Interest rates have been deregulated. Further, interest rates are fluctuating, and minimum cost of capital necessitates anticipating interest rate movements.
2. The rupee has become freely convertible in current account.
3. Optimum debt equity mix is possible. Firms have to take advantage of the financial leverage to increase the shareholders wealth. However, financial leverage entails financial risk. Hence a correct trade off between risk and improved rate of return to shareholders is a challenging task.
4. With free pricing of issues, the optimum price of new issue is a challenging task, as overpricing results in under subscription and loss of investor confidence, whereas underpricing leads to unwarranted increase in a number of shares and also reduction of earnings per share.
5. Maintaining share prices is crucial. In the liberalized scenario, the capital markets are the important avenue of funds for business. The dividend and bonus policies framed have a direct bearing on the share prices.
6. Ensuring management control is vital, especially in the light of foreign participation in equity (which is backed by huge resources) making the firm an easy takeover target.

Notes

Existing managements may lose control in the eventuality of being unable to take up the share entitlements. Financial strategies to prevent this are vital to the present management.

1.4.1 Methods and Tools of Financial Management

1. In the area of financing, funds are procured from long-term sources as well as short-term sources. Long-term funds may be made available by owners, i.e., shareholders, lenders through issue of debentures/bonds, from financial institutions, banks and public at large. Short-term funds may be procured from commercial banks, suppliers of goods, public deposits etc. The finance manager has to decide on optimum capital structure with a view to maximize shareholder's wealth. Financial leverage or trading on equity is an important method by which return to shareholders can be increased.
2. For evaluating capital expenditure (investment) decisions, a finance manager uses various methods such as average rate of return, payback, internal rate of return, net present value and profitability index.
3. In the area of working capital management, there are various methods for efficient utilization of current resources at the disposal of the firm, thus increasing profitability. The centralized method of cash management is considered a better method of managing liquid resources of the firm.
4. In the area of dividend decision, a firm is faced with the problem of declaring dividend or postponing dividend declaration, a problem of internal financing. There are tools to tackle such situation.
5. For the evaluation of a firm's performance, there are different methods.



Example: Ratio analysis is a popular technique to evaluate different aspects of a firm.

6. The main concern of the finance manager is to provide adequate funds from the best possible source, at the right time and the minimum cost and to ensure that the funds so acquired are put to best possible use through various methods/techniques are used to determine that funds have been procured from the best possible available services and the funds have been used in the best possible way. Funds flow and cash flow statements and projected financial statements help a lot in this regard.



Task Which of the following statements do you agree with?

(a) Financial management is essential only in private sector enterprises.

(b) Only capitalists have to bother about money. The bureaucrat is to administer and not to manage funds.

(c) The public administrators in our country must be given a basic understanding of essentials of finance.

(d) A state-owned transport company must immediately deposit in the bank all its takings.

(e) "Financial Management is counting pennies. We do not believe in such miserly attitude".

Notes

1.4.2 Forms of Business Organization

The three most common forms of business organization are sole proprietorship, partnership and the company. Other specialized forms of business organizations also exist. Sole proprietorship is the most in terms of total receipts and in net profits the corporate form of business dominates.

Sole Proprietorship

A sole proprietorship is a business owned by one person who runs for his own profit. Majority of the business firms are sole proprietorships. The typical sole proprietorship is a small business



Example: bakeshop, personal trainer or plumber.

The majority of sole proprietorship are found in the wholesale, retail, service and construction industries.

Typically, the proprietor along with a few employees runs the business. He raises capital from personal resources or by borrowing and is responsible for all business decisions. The sole proprietor has unlimited liability, towards creditors not restricted to the amount originally invested. The key strengths and weaknesses of sole proprietorship are given in Table 1.3.

Partnership

A partnership firm is a business run by two or more persons for profit. Partnership accounts for the next majority of business and they are typically larger than sole proprietorship. Finance, legal and real estate firms often have large number of partners.

Most partnerships are established by a written contract known as 'Deed of Partnership'. In partnership, all partners have unlimited liability for all the debts of the partnership. The strengths and weaknesses or partnerships are summarized in Table 1.3.



Did u know? **Which is the governing act for partnership in India?**

In India, partnership is governed by the Partnership Act, 1932.

Company Form

A company form of business is a legal entity, separated from the owners, with perpetual succession. Just like an individual, the company can sue and be sued, make and be party to contracts and acquire property in its own name. The company form of organization is the dominant form of business organization in terms of receipts and profits. Although, corporations are involved in all types of business, manufacturing corporation account for the largest portion of corporate business receipts and net profits. The key strengths and weaknesses of corporate form are summarized in Table 1.3.

The owners of the company are its shareholders, whose ownership is evidenced by either common shares or preference shares. Shareholders get a return by receiving dividends i.e., periodic distribution of earnings or gains through increase in share price. The owner's liability is limited to the amount paid on their shares. Shareholder elects the Board of Directors through vote. The Board of Directors has the ultimate authority in running the organization including making the general policy.

Notes

The President or Chief Executive Office (CEO) is responsible for managing day-to-day operations and carrying out the policies established by the Board. The CEO is required to report periodically to the firm's board of directors.

The corporate form of business is subject to strict control by Regulatory Agencies including Companies Act, 1956, SEBI, etc.

Table 1.3: Strengths and Weaknesses of the Common Forms of Business Organizations

	Sole Proprietorship	Partnership	Company
Strengths	Owners receive all profits and incur all losses.	Can raise more funds than sole proprietorship.	Owner's liability is limited to the extent paid on their shares.
	Low organizational costs	Borrowing powers enhanced by more owners.	Can achieve large size via sale of shares.
	Income is included and taxed on owners personal tax return.	More available manpower and managerial skill.	Ownership (share) is readily transferable.
	Independence	Income included and mixed on individual partner's tax return.	Long life of the firm.
	Secrecy		Can have professional managers.
	Ease of dissolution		Has better access to financing.
			Receives some tax advantage.
Weaknesses	Owner has unlimited liability towards debt of the firm	Owners have unlimited liability and may have to cover debts of other partners.	Taxes generally higher, because corporate income is taxed and dividends paid to owners are also taxed (the latter has been exempted at the hands of the shareholders in India).
	Limited fund raising power limits growth	Partnership is dissolved when partner dies.	
	Proprietor must be jack-of-all trades.	Difficult to liquidate or transfer partnership.	More expensive to organize than other forms of business.
	Difficult to give employees long-run career opportunities.		Subject to greater control by regulating authorities.
	Lacks continuity when proprietor dies or unable to operate.		Lacks secrecy since the shareholders must receive financial reports at periodic intervals.

Self Assessment

Fill in the blanks:

13. In the area of financing, funds are procured from …… sources as well as ……. sources.

Notes

14. The three most common forms of business organization are sole proprietorship, partnership and the …….. .

15. The …….. method of cash management is considered a better method of managing liquid resources of the firm.

16. The dividend and bonus policies framed have a direct bearing on the …….. .



Case Study

Bhatt Industries – Basic Planning

This case will help the reader, develop an approach to structuring a case solution. It requires a logical approach to solving a general financial problem.

Bhatt Industries has been manufacturing fireworks at a small facility just outside Greensboro, North Carolina. The firm is known for the high level of quality control in its production process and is generally respected by distributors in the states, where fireworks are legalized. Its selling market is fairly well defined; it has the capacity to produce 800,000 cases annually, with peak consumption in the summer. The firm is fairly confident, that the whole of next year's production can be sold for ₹ 25 a case.

On September 7, the company has ₹ 8,000,000 in cash. The firm has a policy against borrowing, to finance its production, a policy first established by William Bhatt, the owner of the firm. Mr. Bhatt keeps a tight rein on the firm's cash and invests any excess cash in treasury bonds, that pays a 12 per cent return and involve no risk of default.

The firm's production cycle revolves around the seasonal nature of the fireworks business. Production begins right after Labour Day and runs through May. The firms sales occur in February through May; the firm closes from June 1 to Labour Day, when its employees return to farming. During this time, Mr. Bhatt visits his grandchildren in New York and Pennsylvania. As a result of this scheduling, the firm pays all its expenses during September and in May receives, all its revenues from its distributors within 6 weeks after the 4th of July. The customers send their checks directly to Kenmy National Bank, where the money is deposited in Bhatt's account.

Mr. Bhatt is the only full-time employee of his company and he and his family hold all the common stock. Thus, the company's only costs are directly related to the production of fireworks. The costs are affected by the law of variable proportions, depending on the production level. The first 100,000 cases cost ₹ 16 each; the second 100,000 cases, ₹ 17 each; the third 100,000 cases, ₹ 18 each and the fourth 100,000 cases, ₹ 19 each; the fifth 100,000 cases, ₹ 20 each; the sixth 100,000 cases, ₹ 21 each. As an example, the total of 200,000 cases would be ₹ 1,600,000 plus ₹ 1,700,000 or ₹ 3,300,000.

BHATT INDUSTRIES - INCOME STATEMENT (August 31, fiscal year just ended)	
	₹
Revenues from operations	50,00,000
Revenues from interest on government bonds	9,20,000
Total revenues	59,20,000
Operating expenses	40,50,000
Earnings before taxes	18,70,000
Taxes	9,48,400
Net income after taxes	9,21,600

Contd...

Notes

Bhatt Industries is a corporation and pays a 30 per cent tax on income, because of the paperwork involved. Mr. Bhatt invests his excess cash on September 6 in one year treasury bonds. He does not invest for shorter periods.

Questions

1. How does this level affect long-term prospects of wealth maximization?
2. What should be the level of production to maximize the profit?

1.5 Summary

- Financial Management is broadly concerned with the acquisition and use of funds by a business firm.
- It has been traditionally argued that the objective of a company is to earn profit. This means that the finance manager has to make decision in a manner that the profit is maximised.
- The alternative to profit maximization is wealth maximization. This is also known as Value maximization or Net Present Worth maximization.
- The important aspects of the finance function have to be carried on by the top management i.e., the Managing Director and the Board of Directors.
- Finance is defined as the lifeblood of an organization. It is a common thread, which binds all the organizational functions as each function when carried out creates financial implications.
- The three most common forms of business organization are sole proprietorship, partnership and the company.
- In the area of financing, funds are procured from long-term sources as well as short-term sources.
- For evaluating investment decisions, a finance manager uses various methods such as average rate of return, payback, internal rate of return, net present value and profitability index.
- In the area of dividend decision, a firm is faced with the problem of declaring dividend or postponing dividend declaration, a problem of internal financing.

1.6 Keywords

Corporate Finance: Corporate finance is the activity concerned with planning, raising, controlling and administering of the funds used in the business.

Dividend: Dividend is a part of profits that are available for distribution to shareholders.

Financial Management: It is the operational activity of a business that is responsible for obtaining and effectively utilising the funds necessary for efficient operations.

Financing Decision: It is related to the financing mix or capital structure or leverage and the determination of the proportion of debt and equity.

Investment Decision: Investment decision is related with the selection of assets, that a firm will invert.

Wealth Maximization: It is maximizing the present value of a course of action (i.e. NPV = GPC of benefits – Investment).

Notes

1.7 Review Questions

1. What are the tasks of Financial Management?
2. Discuss the salient features of the traditional approach to corporation finance.
3. Discuss the distinctive features of modern approach to corporation finance.
4. What is the normative goal of Financial Management?
5. "Financial Management is an integral part of the jobs of all managers. Hence, it cannot be entrusted to a staff department". Discuss.
6. Discuss some of the problems financial managers in a developing country like India have to grapple with.
7. Draw a typical organization chart highlighting the finance function of a company.
8. "The profit maximization is not an operationally feasible criterion." Do you agree? Justify.
9. 'Finance is considered to be the blood of the enterprise'. Justify.
10. You are the finance manager of a firm and asked to organize all the financial decisions of the firm. Elucidate the ways in which you will do it.

Answers: Self Assessment

1.	raising of funds	2.	procurement of funds
3.	working capital	4.	Gross
5.	direct	6.	Wealth maximization
7.	detrimental	8.	judgment
9.	Dividend	10.	financing
11.	lifeblood	12.	Investment
13.	long-term, short-term	14.	company
15.	centralized	16.	share prices

1.8 Further Readings



Books

Chandra, P., *Financial Management – Theory and Practice,* New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Dr Pradeep Kumar Sinha, *Financial Management,* New Delhi, Excel Books, 2009.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management,* New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Unit 2: Time Value of Money

Notes

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Objectives

After studying this unit, you will be able to:

- Explain the time value of money of single amount;
- Identify the conception of present and future value of annuity;
- Describe the concept of perpetuity;
- Discuss various significant aspects related to growth rate calculations.

Introduction

This unit is concerned with interest rates and their effects on the value of money. Interest rates have widespread influence over decisions made by businesses and by us in personal lives. Corporations pay lakhs of rupees in interest each year for the use of money they have borrowed. We earn money on sums we have invested in savings accounts, certificate of deposit, and money market funds. We also pay for the use of money that we have borrowed for school loans, mortgages, or credit card purchases. We will first examine the nature of interest and its computation. Then, we will discuss several investment solutions and computations related to each.

2.1 Future Value of Single Amount

Money available at present is more valuable than money value in future.



Did u know? **What is interest?**

The compensation for waiting is the time value of money is called interest. Interest is a fee that is paid for having the use of money.

Notes



Example: Interest on mortgages for having the use of bank's money.

Similarly, the bank pays us interest on money invested in savings accounts or certificates of deposit because it has temporary access to our money. The amount of money that is lent or invested is called principal. Interest is usually paid in proportion and the period of time over which the money is used. The interest rate is typically stated as a percentage of the principal per period of time.



Example: 18 per cent per year or 1.5 per cent per month.

Interest that is paid solely on the amount of the principal is called simple interest. Simple interest is usually associated with loans or investments that are short-term in nature. The computation of simple interest is based on the following formula:

Simple interest = principal × interest rate per time period × number of time period



Example: A person lends ₹ 10,000 to a corporation by purchasing a bond from the corporation. Simple interest is computed quarterly at the rate of 3 per cent per quarter, and a cheque for the interest is mailed each quarter to all bondholders. The bonds expire at the end of 5 years and the final cheque includes the original principal plus interest earned during the last quarter. Compute the interest earned each quarter and the total interest which will be earned over the 5-year life of the bonds.

Solution: In this problem, principal = ₹ 10,000, interest = 3 per cent per quarter and the period of loan is 5 years. Since the time period for interest is a quarter of a year, we must consider 5 years as 20 quarters. And since we are interested in the amount of interest earned over one quarter, the period is 1 quarter. Therefore, quarterly interest equals ₹ 10,000 × 0.03 × 1 = ₹ 300

To compute total interest over the 5-year period, we multiply the per-quarter interest of ₹ 300 by the number of quarters 20, to obtain

Total interest = ₹ 300 × 20 = ₹ 6,000

Compound Interest: Compound Interest occurs when interest earned during the previous period itself earns interest in the next and subsequent periods. If ₹ 1000 is placed into savings account paying 6% interest per year, interest accumulates as follows:

Principal invested in the first year	₹ 1000.00
Interest for first year (₹ 1000 × 0.06 × 1)	60.00
Amount available at end of first year	1060.00
Interest for second year (₹ 1060 × 0.06 × 1)	63.60
Amount available at end of second year	₹ 1123.60

The interest earned in the second year is greater than ₹ 60 because it is earned on the principal plus the first year's interest. If the savings account pays 6% interest compounded quarterly, 1.5% interest is added to the account each quarter, as follows:

Principal invested in the first year	₹ 1000.00
Interest for first quarter (₹ 1000 × 0.06 × 1 × 1/4)	15.00

Notes

Amount available at end of first quarter	1015.00
Interest for second quarter (₹ 1015 × 0.06 × 1 × 1/4)	15.23
Amount available at end of second quarter	₹ 1030.23
Interest for third quarter (₹ 1030.23 × 0.06 × 1 × 1/4)	15.45
Amount available at end of third quarter	1045.68
Interest for fourth quarter (₹ 1045.68 × 0.06 × 1 × 1/4)	15.69
Amount available at end of first year	1061.37

With quarterly compounding, the initial investment of ₹ 1000 earned ₹ 1.37 more interest in the first year than with annual compounding. Compound interest is defined with the following terms:

P = principal sum earns

i = interest rate per period

n = number of period during which compounding takes place – a period can be any length in time

Future Value of ₹1

A sum of money invested today at compound interest accumulates to a larger sum called the amount or future value. The future value of ₹ 1000 invested at 6% compounded annually for 2 years is ₹ 1123.60. The future value includes the original principal and the accumulated interest.

Notes The future value varies with the interest rate, the compounding frequency and the number of periods.

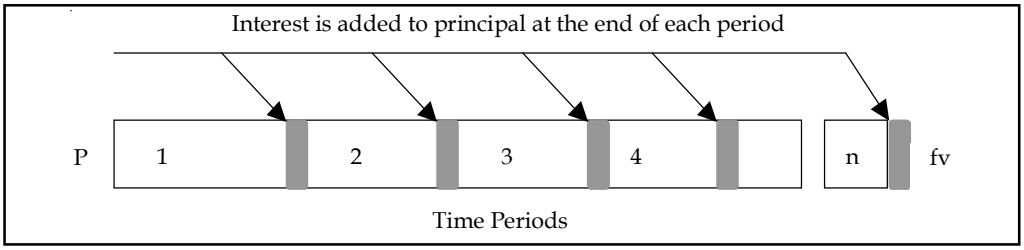
If the future value of ₹ 1 principal investment is known, we can use it to calculate the future value of any amount invested. For example, at 8% interest per period, ₹ 1 accumulates as follows:

Future value of ₹ 1 at 8% for 1 period = ₹ 1.00000 × 1.08 = ₹ 1.08000

Future value of ₹ 1 at 8% for 2 periods = ₹ 1.08000 × 1.08 = ₹ 1.16640

Future value of ₹ 1 at 8% for 3 periods = ₹ 1.16640 × 1.08 = ₹ 1.25971

The above table can be diagrammed as follows:



The end of each period is designated by a grey cylinder like the figure. The arrows pointing to the end of each period indicate that payments are made into the investment. The general formula for the future value of ₹ 1, with n representing the number of compounding period is

$fv = (1 + i)^n$

Notes

Using this formula, future values can be calculated for any interest rate and any number of time periods. To obtain the future value of any principal other than ₹ 1, we multiply the principal by the factor for the future value of ₹ 1.

$$fv = (1 + i)^n$$

or $$fv = Pf$$

where f is the factor in the future value of ₹ 1, with interest rate i and number of periods n.



Example: XYZ Company invests ₹ 40,00,000 in certificates of deposit that earn 16% interest per year, compounded semi-annually. What will be the future value of this investment at the end of 5 years when the company plans to use it to build a new plant?

Solution: Compounding is semi-annual and there are 5 years, so the number of half-year periods is 10. The semi-annual interest rate is half of the 16% annual rate or 8%. With i = 8% and n = 10, the factor in the table is 2.15892. Multiplying this factor by the principal investment, we get:

$$fv = P \times f(\text{n} = 10, i = 8\%)$$

$$= ₹\ 40,00,000 \times 2.15892$$

$$= 86,35,680$$

Self Assessment

Fill in the blanks:

1. The compensation for waiting is the time value of money, called …….. .
2. The future value includes the original principal and the …….. .
3. The future value varies with the interest rate, the …….. frequency and the number of periods.

2.2 Present Value of Single Amount

If ₹ 1 can be invested at 8% today to become ₹ 1.08 in the future, then ₹ 1 is the present value of the future amount of ₹ 1.08. The present value of future receipts of money is important in business decision-making. It is necessary to decide how much future receipts are worth today in order to determine whether an investment should be made or how much should be invested. Finding the present value of future receipts involves discounting the future value to the present. Discounting is the opposite of compounding. It involves finding the present value of some future amount of money that is assumed to include interest accumulations.

Present Value of ₹ 1

Knowing the present value of ₹ 1 is useful because it enables us to find the present value of any future payment. Assuming 8% interest per period, a table of present values of ₹ 1 can be constructed as follows:

Present value of ₹ 1 discounted for 1 period at 8% = ₹ 1.0/1.08 = ₹ 0.92593

Present value of ₹ 1 discounted for 2 periods at 8% = ₹ 0.92593/1.08 = ₹ 0.85734

Present value of ₹ 1 discounted for 3 periods at 8% = ₹ 0.85734/1.08 = ₹ 0.79383

Notes

The general formula for the present value of ₹ 1 is

$$pv = 1/(1+i)n$$

The present value on the tables can be constructed from this formula.



Caution To find out the present value of any future amount, the appropriate factor from the table is multiplied by the amount.



Example: Alpha company can invest at 16 per cent compounded annually. Beta company can invest at 16 per cent compounded semi-annually. Each company will need ₹ 2,00,000 four years from now. How much must each invest today?

Solution: With annual compounding n = 4 and I = 16 per cent. With semi-annual compounding n = 8 and i = 8 per cent. Using the above formula we find the present value

$$=1/(1.16)^4 =0.55229 \times 2,00,000 = ₹\ 110,458$$

For Beta Company present value = $2,00,000 \times 1/(1.08)^4 = 200,000 \times 0.54027 = ₹\ 108,054$

Beta company needs to invest less than Alpha Company because its investment grows faster due to more frequent compounding.



Did u know? The more frequent the compounding the smaller the present value.

Self Assessment

Fill in the blanks:

4. Discounting is the opposite of …….. .
5. Finding the present value of future receipts involves ……. the future value to the present.
6. The more frequent the compounding the ……. the present value.

2.3 Present and Future Value of Annuities

An annuity is a series of equal payments made at equal time intervals, with compounding or discounting taking place at the time of each payment. Each annuity payment is called a rent. There are several types of annuities, out of which in an ordinary annuity each rent is paid or received at the end of each period.



Notes

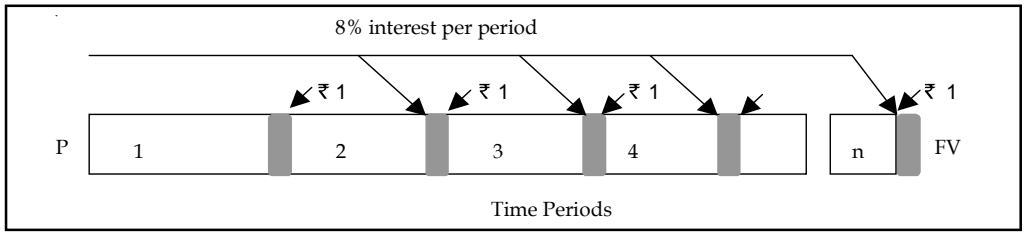
1. There are as many rents as there are periods.
2. Installment purchases, long-term bonds, pension plans, and capital budgeting all involve annuities.

Notes

2.3.1 Future Value of Annuity of ₹ 1

If you open a savings account that compounds interest each month, and at the end of each month you deposit ₹ 100 in the savings account, your deposits are the rents of an annuity. After 1 year, you will have 12 deposits of ₹ 100 each, and a total of ₹ 1200, but the account will have more than ₹ 1200 in it because each deposit earns interest. If the interest rate is 6 per cent a year, compounded monthly, your balance is ₹ 1233.56. The future value of an annuity or amount of annuity is the sum accumulated in the future from all the rents paid and the interest earned by the rents. The abbreviation FV is used for the future value of an annuity to differentiate it from the lower case fv used for the future value of ₹ 1.

To obtain a table of future values of annuities, we assume payments of ₹ 1 each period made into a fund that earns 8 per cent interest compounded each period. The following diagram illustrates an annuity of four payments of ₹ 1, each paid at the end of each period, with interest of 8 per cent compounded each period.



Notice that there are four rents and four periods, each rent is paid at the end of each period. At the end of the first period, ₹ 1 is deposited and earns interest for three periods. The next rent earns interest for two periods, and so on. The amount at the end of the fourth period can be determined by calculating the future value of each individual ₹ 1 deposit as follows:

Future value of ₹ 1 at 8% for 3 periods	=	₹ 1.25971
Future value of ₹ 1 at 8% for 2 periods	=	₹ 1.16640
Future value of ₹ 1 at 8% for 1 period	=	₹ 1.08000
The fourth rent of ₹ 1 earns no interest	=	₹ 1.0000
Total for 4 rents		₹ 4.50611

The formula for the future value of an annuity of ₹ 1 can be used to produce tables for a variety of periods and interest rates

$$Fv = \frac{(1+1)^n - 1}{i}$$

Example: In the beginning of 2006, the directors of Molloy Corporation decided that plant facilities will have to be expanded in a few years. The company plans to invest: ₹ 50,000 every year, starting on June 30, 2006, into a trust fund that earns 11 per cent interest compounded annually. How much money will be in the fund on June 30, 2010, after the last deposit has been made?

Solution: The first deposit is made at the end of the first 1-year period, and there is a total of 5 periods. The last deposit, made on June 30, 2010 earns no interest. The investment is an ordinary annuity with n = 5 and i = 11 per cent. From Table Future Value of Annuity ₹ 1 we find that the amount of an ordinary annuity of ₹ 1 is 6.22780.

Notes

FV = Rent × f (n = 5, i = 11%)

= ₹ 50,000 × 6.22780 = ₹ 311,390

If the company needs a total of ₹ 3,00,000 on June, 30, 2010, how much would it have to deposit every year? Here we have to solve for the rent, given the future value, as follows:

FV = Rent × f (n = 5, i = 11%)

₹ 3,00,000 = Rent × 6.22780

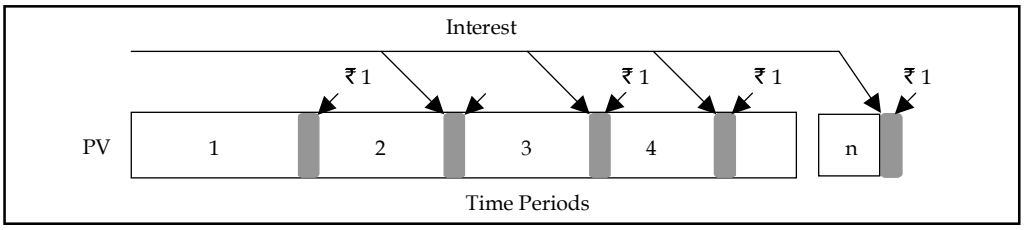
Rent = ₹ 3,00,000/6.22780 = ₹ 48,171.10

The company has to deposit ₹ 48,171 each time in order to accumulate the necessary ₹ 3,00,0000 by June 30, 2010.

2.3.2 Present Value of Annuity of ₹ 1

The present value of an annuity is the sum that must be invested today at compound interest in order to obtain periodic rents over some future time.

Notice that we use the abbreviation PV for the present value of an annuity, as differentiated from the lower case pv for the present value of ₹ 1. By using the present value of ₹ 1, we can obtain a table for the present value of an ordinary annuity of ₹ 1. The present value of an ordinary annuity of ₹ 1 can be illustrated as follows:



With each rent available at the end of each period, when compounding takes place, the number of rents is the same as the number of periods. By discounting each future event to the present, we find the present value of the entire annuity.

Present value of ₹ 1 discounted for 1 period at 8% = ₹ 0.92593

Present value of ₹ 1 discounted for 2 periods at 8% = 0.85734

Present value of ₹ 1 discounted for 3 periods at 8% = 0.79383

Present value of ₹ 1 discounted for 4 periods at 8% = 0.73503

Present value of annuity of 4 rents at 8% ₹ 3.31213

The first rent is worth more than others because it is received earlier. Table on present value of annuities may be used to solve problems in this regard. The formula used to construct the table is:

$$PV = \frac{1 - \frac{1}{(1+i)^n}}{i}$$

Example: Mr. F, the owner of F Corporation is retiring and wants to use the money from the sale of his company to establish a retirement plan for himself. The plan is to provide an income of ₹ 5,00,000 per year for the rest of his life. An insurance company calculates that his life expectancy is 32 more years and offers an annuity that yields 9 per cent compounded annually. How much the insurance company wants now in exchange for the future annuity payments?

Notes

Solution: The investment today is the present value of an annuity of ₹ 5,00,000 per year, with n = 32 and i = 9 per cent compounded annually. From the cumulative present value table we find the factor 10.40624 which is the present value if the rents were ₹ 1.

$$PV = \text{Rent} \times f\ (n = 32, i = 9\%)$$

$$= ₹\ 5,00,000 \times 10.40624 = ₹\ 52,03,120$$

Effective Interest Rate

In the real world, interest rates are often compounded more often than once per year. By convention, interest rates are quoted on an annual basis. An interest rate, quoted on an annual basis, which is compounded more often than once per year is called a nominal rate, stated rate, quoted rate, or Annual Percentage Rate (APR). For example, mortgages typically require monthly payments and, therefore, the interest rates quoted on mortgages are compounded monthly. Thus, the nominal interest rate on a mortgage might be 12% compounded monthly. However, the relevant rate for valuations is the periodic rate. The periodic rate is computed by dividing the nominal rate by the number of compounding periods per year.

$$r = \frac{r_{nom}}{m}$$

where

- r = the rate per period,
- r_{nom} = the nominal rate, and
- m = the number of compounding periods per year.

Thus a 12% nominal rate compounded monthly is equivalent to a periodic rate of 1% per month.

The Effective or Equivalent Annual Rate (EAR) is the interest rate compounded annually that is equivalent to a nominal rate compounded more than once per year. In other words, present and future values computed using the EAR will be the same as those computed using the nominal rate. The EAR is computed as follows:

$$EAR = \left(1 + \frac{r_{nom}}{m}\right)^{m} - 1$$

- EAR = the Equivalent or Effective Annual Rate,
- r_{nom} = the nominal interest rate,
- m = the number of compounding periods per year

Moreover, it is not proper to directly compare interest rates which have a particular compounding frequency with those that have a different compounding frequency, e.g., comparing 10.1% compounded semiannually with 10% compounded quarterly. This problem can be overcome by finding the EAR for each of the rates and then comparing the EARs.

First, let's find the EAR for 10.1% compounded semiannually. Here, m equals 2.

EAR for 10.1% compounded semiannually

$$EAR = \left(1 + \frac{0.101}{2}\right)^{2} - 1 = 0.1036 = 10.36\%$$

Now, let's find the EAR for 10% compounded quarterly. Here m = 4.

Notes

EAR for 10% compounded quarterly

$$EAR = \left(1 + \frac{0.10}{4}\right)^4 - 1 = 0.1038 = 10.38\%$$

Thus, we see that 10% compounded quarterly is actually a higher interest rate than 10.1% compounded semiannually. Given a choice, we would prefer to invest at 10% compounded quarterly.

Annuity Due

An **annuity-due** is an annuity whose payments are made at the beginning of each period. Some of the common examples of annuity due are deposits in savings, rent or lease payments, and insurance premiums.

Because each annuity payment is allowed to compound for one extra period, the value of an annuity-due is equal to the value of the corresponding ordinary annuity multiplied by (1+i).

Present value of Annuity Due

PVA_n = CIF ($FVIF_{I, n}$) (1 + I) or

$$PVA_n = CIF\left(\frac{1-(1+I)^{-n}}{I}\right)(1+I)$$

Illustration: Mr. Bhat has to receive ₹ 500 at the beginning of each year, for 4 years. Calculate personal value of annuity due, assuming 10 per cent rate of interest.

Solution:

PVA_4 = ₹ 500 (3.170) (1.10) = ₹ 1743.5

Alternatively

Years	Cash inflow (₹)	PV Factor at 10 per cent	Present value (₹)
1	500	1.00	500.0
2	500	0.909	454.5
3	500	0.826	413.0
4	500	0.751	375.5
PV of Annuity			**1743.0**

Self Assessment

Fill in the blanks:

7. ……. is a series of equal payments made at equal time intervals, with compounding or discounting taking place at the time of each payment.
8. The ……. of an annuity is the sum that must be invested today at compound interest in order to obtain periodic rents over some future time.
9. The ……. of an annuity or amount of annuity is the sum accumulated in the future from all the rents paid and the interest earned by the rents.

Notes

2.4 Perpetuities

An annuity that goes on for ever is called a perpetuity. The present value of a perpetuity of ₹ C amount is given by the simple formula: C/i where i is the rate of interest.

This is because as the length of time for which the annuity is received increases, the annuity discount factor increases but as length gets very long, this increase in the annuity factor slows down.



Caution As annuity life becomes infinitely long the annuity discount factor approaches an upper limit. Such a limit is 1/i.



Example: Many business problems are solved by use of compound interest and present value tables. For example, B Corporation is investigating two possible investments. Project A is the purchase of a mine for ₹ 20,00,000 which will give an expected income from sale of ore of ₹ 480,000 per year for 10 years, after which the property will be sold at an estimated price of ₹ 600,000. Project B is the purchase of an office building that is leased for 15 years. The lease provides annual receipts of ₹ 4,00,000 at the end of the each of the next 4 years, and annual receipts of ₹ 4,50,000 for the remaining life of the lease. The purchase price is ₹ 20,00,000. B Corporation requires a 20 per cent return on its investments. Which investment is preferable?

Solution:

To evaluate Project A we need to find the present value of the future income stream of ₹ 4,80,000 per year for 10 years plus the present value of the future sales price of ₹ 6,00,000, both discounted to the present at the company's required rate of return of 20 per cent.

PV of annuity of ₹ 4,80,000 (n = 10, i = 20%) = 480,000 × 4.19247	₹ 20,12,386
PV of ₹ 6,00,000 at the end of 10 years = 600,000 × 0.16151	96,906
Total present value of Project A cash inflows	21,09,292

The problem can be broken down into two separate annuities, one with receipts of ₹ 4,50,000 per year for 15 years and the other with payments of ₹ 50,000 for 4 years. The present value of the two annuities can be found by computing the present value of ₹ 4,50,000 for 15 years at 20 per cent minus an annuity of ₹ 50,000 for 4 years at 20 per cent.

PV of annuity of ₹ 4,50,000 (n = 15, i = 20 per cent) = 450,000 × 4.67547	21,03,961
PV of annuity of ₹ 50,000 (n = 4, i = 20 per cent) = 50,000 × 2.58873	(1,29,437)
Total present value of project B cash inflows	19,74,524

By discounting each project at the company's required rate of return, we find the Project A.

Cash inflows have a present value of ₹ 12,09,292 and Project B cash inflows have a present value of ₹ 19,74,524. Since the asking price of each project is ₹ 20,00,000, project B should not be accepted. The value of project A is greater than the asking price, therefore the company should acquire Project A.



Task Calculate the present value of cash flows of ₹ 700 per year for ever (in perpetuity)

(a) Assuming an interest rate of 7%

(b) Assuming an interest rate of 10%

Self Assessment

Notes

Fill in the blanks:

10. An annuity that goes on for ever is called a…….. .
11. The present value of a perpetuity of ₹ C amount is given by the simple formula: C/i where i is the…….. .
12. Many business problems are solved by use of compound interest and …….tables.

2.5 Calculation of the Compound Growth Rate

Compound growth rate can be calculated with the following formula:

$$gr = V_o(1 + r)^n = V_n$$

where,

gr = Growth rate in percentage.

V_o = Variable for which the growth rate is needed (i.e., sales, revenue, dividend at the end of year '0').

V_n = Variable value (amount) at the end of year 'n'.

$(1 + r)^n$ = Growth rate.

Illustration: From the following dividend data of a company, calculate compound rate of growth for period (1998-2003).

Year	1998	1999	2000	2001	2002	2003
Dividend per share (₹)	21	22	25	26	28	31

Solution:

$$21 (1 + r)^5 = 31$$

$$(1 + r)^5 = 31/21 = 1.476$$

Notes See the compound value one rupee Table for 5 years (total years – one year) till you find the closest value to the compound factor, after finding the closest value, see first above it to get the growth rate.

Task Determine the rate of growth of the following stream of dividends a person has received from a company:

Year	Dividend (per share)(₹)
1	2.50
2	2.60
3	2.74
4	2.88
5	3.04

Notes

Doubling Period

Doubling period is the time required, to double the amount invested at a given rate of interest. For example, if you deposit ₹ 10,000 at 6 per cent interest, and it takes 12 years to double the amount. (See compound value for one rupee table at 6 per cent till you find the closest value to 2).

Doubling period can be computed by adopting two rules, namely:

1. ***Rule of 72:*** To get doubling period 72 is divided by interest rate.

   Doubling period (D_p) = 72 ÷ I

   Where,

   I = Interest rate.

   D_p = Doubling period in years.



Example: If you deposit ₹ 500 today at 10 per cent rate of interest, in how many years will this amount double?

Solution:

D_p = 72 ÷ I = 72 ÷ 10 = 7.2 years (approx.)

2. ***Rule of 69:*** Rule of 72 may not give the exact doubling period, but rule of 69 gives a more accurate doubling period. The formula to calculate the doubling period is:

   D_p = 0.35 + 69/I

Illustration: Take the above problem as it is and calculate doubling period.

Solution:

D_p = 0.35 + 69/10 = 7.25 years.

Effective Rate of Interest in Case of Doubling Period

Sometimes investors may have doubts as to what is the effective interest rate applicable, if a financial institute pays double amount at the end of a given number of years.

Effective rate of interest can be defined by using the following formula.

(a) In case of rule of 72

ERI = 72 per cent Doubling period (D_p)

where,

ERI = Effective rate of interest.

D_p = Doubling period.



Example: A financial institute has come with an offer to the public, where the institute pays double the amount invested in the institute by the end of 8 years. Mr. A, who is interested to make a deposit, wants to know the affective rate of interest that will be given by the institute. Calculate:

Solution:

ERI = 72 ÷ D_p = 72 ÷ 8 years = 9 per cent

(b) In case of rule of 69

Notes

$$ERI = \frac{69}{D_P} + 0.35$$

Illustration: Take the above example:

$$ERI = \frac{69}{8\ years} + 0.35$$

= 8.98 per cent or 9 per cent

Self Assessment

Fill in the blanks:

13. Compound growth rate can be calculated with the formula- …….. .
14. To get doubling period 72 is divided by …….. rate.
15. …….. period is the time required, to double the amount invested at a given rate of interest.



Case Study

Comparing Mortgage Alternatives

The application of the time value of money principles can help you make decisions on loan alternatives. This exercise requires you to compare three mortgage alternatives using various combinations and points. Points on a mortgage refer to a payment that is made upfront to secure the loan. A single point is a payment of one per cent of the amount of the total mortgage loan. If you were borrowing ₹ 200,000 a single point would require an upfront payment of ₹ 2,000.

When you are evaluating alternative mortgages, you may be able to obtain a lower rate by making an upfront payment. This comparison will not include an after-tax comparison. When taxes are considered, the effective costs are affected by interest paid and the amortization of points on the loan. This analysis will require you to compare only before-tax costs.

Zeal.com allows you to compare the effective costs on alternative mortgages. You are considering three alternatives for a ₹ 250,000 mortgage. Assume that the mortgage will start in December, 2006. The mortgage company is offering you a 6% rate on a 30-year mortgage with no points. If you pay 1.25 points, they are willing to offer you the mortgage at 5.875%. If you pay 2 points, they are willing to offer you the mortgage at 5.75%.

Questions

1. What are the mortgage payments under the three alternatives?
2. Which alternative has the lowest effective cost?
3. Can you explain how the effective rate is being calculated?

Notes

2.6 Summary

- The compensation for waiting is the time value of money, called interest. Interest is a fee that is paid for having the use of money.
- The future value varies with the interest rate, the compounding frequency and the number of periods.
- The general formula for the future value of ₹ 1, with n representing the number of compounding period is $fv = (1 + i)^n$.
- Finding the present value of future receipts involves discounting the future value to the present. Discounting is the opposite of compounding.
- The general formula for the present value of ₹ 1 is $pv = 1/(1+i)^n$.
- An annuity is a series of equal payments made at equal time intervals, with compounding or discounting taking place at the time of each payment. Each annuity payment is called a rent.
- The future value of an annuity or amount of annuity is the sum accumulated in the future from all the rents paid and the interest earned by the rents.
- The present value of an annuity is the sum that must be invested today at compound interest in order to obtain periodic rents over some future time.
- An annuity that goes on for ever is called a perpetuity. The present value of a perpetuity of ₹ C amount is given by the simple formula: C/i where i is the rate of interest.
- Compound growth rate can be calculated with the following formula:

$$gr = V_o(1 + r)^n = V_n$$

2.7 Keywords

Annuity: It is a stream of equal annual cash flows.

Cash Flow: It is the movement of cash into or out of a business, a project, or a financial product. It is usually measured during a specified, finite period of time.

Compound Interest: When interest is added to the principal, so that from that moment on, the interest that has been added also itself earns interest.

Compound Value: The interest earned on the initial principal becomes a part of the principal at the end of a compounding period.

Interest: It is a fee paid on borrowed assets. It is the price paid for the use of borrowed money.

Present Value: In case of present value concept, we estimate the present worth of a future payment/instalment or series of payment adjusted for the time value of money.

Time Value of Money: Time value of money is that the value of money changes over a period of time.

2.8 Review Questions

1. "Cash flows of two years in absolute terms are uncomparable" Give reasons in support of your answer.

Notes

2. Define the following terms and phrases:
   (a) Compound sum of an annuity
   (b) Present value of a future sum
   (c) Present value of an annuity
   (d) Annuity
   (e) Discount rate
3. What happens to the effective rate of interest as the frequency of compounding is increased?
4. As a financial consultant, will you advise your client to have term deposit in a commercial bank, which pays 8% interest compounded semi-annually or 8% interest compounded annually? Why?
5. What effects do (1) increasing rate of interest and (2) increasing time periods have on the (a) present value of a future sum and (b) future value of the present sum? Why?
6. Can annuity tables be used for all types of cash flows?
7. For a given interest rate and a given number of years, is the factor for the sum of an annuity larger or smaller than the interest factor for the present value of the annuity?
8. Explain the mechanics of calculating the present value of a mixed stream that includes an annuity.
9. A limited company borrows from a commercial bank ₹ 10,00,000 at 12% rate of interest to be paid in equal end-of-year installments. What would the size of the instalment be? Assume the repayment period is 5 years.
10. If ABC company expects cash inflows from its investment proposal it has undertaken in time zero period, ₹ 2,00,000 and ₹ 1,50,000 for the first two years respectively and then expects annuity payment of ₹ 1,00,000 for next eight years, what would be the present value of cash inflows, assuming 10% rate of interest?
11. The XYZ company is establishing a sinking fund to retire ₹ 5,00,000 8% debentures 10 years from today. The company plans to put a fixed amount into the fund each year for 10 years. The first payment will be made at the end of current year. The company anticipates that the fund will earn 6% a year. What equal annual contributions must be made to accumulate ₹ 5,00,000, 10 years from now?
12. Calculate the price of 10% debentures having face value of ₹ 100, to be redeemed after 10 years at par and paying interest after every six months, assuming the market rate of interest of debentures of similar risk and maturity period is (a) 10%, (b) 12%, (c) 8%

Answers: Self Assessment

1.	interest	2.	accumulated interest
3.	compounding	4.	compounding
5.	discounting	6.	smaller
7.	Annuity	8.	present value
9.	future value	10.	perpetuity
11.	rate of interest	12.	present value

Notes

13. $gr = V_o(1 + r)^n = V_n$
14. interest
15. Doubling

2.9 Further Readings



Books

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Unit 3: Sources of Finance

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Notes

Objectives

After studying this unit, you will be able to:

- Identify the different long-term sources of finance;
- Explain the different short-term sources of finance;
- Describe the leasing as a source of finance;
- Discuss the various significant aspects related to venture capital finance.

Introduction

One of the most important element for an entrepreneur or company implementing a new project or undertake expansion, diversification, modernization and rehabilitation scheme is working out the cost of project and the means of finance. There are several sources of finance/ funds available to any company. Among the various sources of funds available to a company an effective mechanism is required to evaluate risk, tenure and cost of each and every source of fund. The selection of the fund source is dependent on the financial strategy pursued by the company, the leverage planned by the company, the financial conditions prevalent in the economy and the risk profile of both viz., the company as well as the industry in which the company operates. Each and every source of funds has some merits and demerits.

3.1 Financial Needs and Sources of Finance of a Business

Financial Needs of a Business

The financial needs of a business may be grouped into following three categories:

1. ***Long-term financial needs:*** Such needs generally refer to funds for a period exceeding 5-10 years. All investments in plant, machinery, land, buildings, etc., are considered as long-term financial needs. Funds required to finance permanent or hard-core working capital should also be procured from long-term sources.
2. ***Medium-term financial needs:*** Such requirements refer to funds for a period exceeding one year but not exceeding 5 years. For example, if a company as part of strategy goes for extensive publicity and advertisement campaign then such type of expenses, may be written off over a period of 3 to 5 years. These are called deferred revenue expenses and funds required for them are classified in the category of medium term financial needs. Sometimes, long-term requirements, for which long-term funds cannot be arranged immediately, may be met from medium-term sources and thus the demand of medium-term finance is generated. As and when the desired long-term funds are made available, medium-term loans taken earlier may be paid off.
3. ***Short-term financial needs:*** To finance current assets such as stock, debtors, cash, etc., investment in these assets is known as meeting of working capital requirements of the concern. Firms require working capital to employ fixed assets gainfully. The requirement of working capital depends upon a number of factors, which may differ from industry to industry and from company to company in the same industry. The main characteristic of short-term financial needs is that they arise for a short period of time, not exceeding the accounting period i.e., one year.

The basic principle for meeting the short-term financial needs of a concern is that such needs should be met from short-term sources, and for medium-term financial needs from medium-term sources and long-term financial needs from long-term sources. Accordingly, the method of

Notes

raising funds is to be decided with reference to the period for which funds are required. Basically, there are two sources of raising funds for any business enterprise viz., owner's capital and borrowed capital. The owner's capital is used for meeting long-term financial needs and it primarily comes from share capital and retained earnings. Borrowed capital for all the other types of requirement can be raised from different sources such as debentures, public deposits, loans from financial institutions and commercial banks, etc.

The following section shows at a glance the different sources from where the three aforesaid types of finance can be raised in India.

Sources of Finance of a Business

1. ***Long-term:***
   - (a) Share capital or equity share
   - (b) Preference shares
   - (c) Retained earnings
   - (d) Debentures/Bonds of different types
   - (e) Loans from financial institutions
   - (f) Loans from State Financial Corporation
   - (g) Loans from commercial banks
   - (h) Venture capital funding
   - (i) Asset securitisation
   - (j) International financing like Euro-issues, foreign currency loans
2. ***Medium-term:***
   - (a) Preference shares
   - (b) Debentures/Bonds
   - (c) Public deposits/fixed deposits for a duration of three years
   - (d) Commercial banks
   - (e) Financial institutions
   - (f) State financial corporations
   - (g) Lease financing/hire purchase financing
   - (h) External commercial borrowings
   - (i) Euro – issues
   - (j) Foreign currency bonds
3. ***Short-term:***
   - (a) Trade credit
   - (b) Commercial banks
   - (c) Fixed deposits for a period of 1 year or less
   - (d) Advances received from customers
   - (e) Various short-term provisions

Notes

It is evident from the above section that funds can be raised from the same source for meeting different types of financial requirements.



Notes Financial sources of a business can also be classified as follows by using different basis:

1. According to period:
   (a) Long-term sources
   (b) Medium-term sources
   (c) Short-term sources
2. According to ownership:
   (a) Owner's capital or equity capital, retained earnings, etc.
   (b) Borrowed capital such as debentures, public deposits, loans, etc.
3. According to source of generation:
   (a) Internal sources e.g., retained earnings and depreciation funds, etc.
   (b) External sources e.g., debentures, loans, etc.

However for the sake of convenience, the different sources of funds can also be classified into following categories:

1. Security financing – financing through shares and debentures
2. Internal financing – financing through retained earning, depreciation
3. Loans financing - this includes both short-term and long-term loans
4. International financing
5. Other sources

Self Assessment

Fill in the blanks:

1. Long-term financial needs generally refer to funds for a period exceeding …….. years.
2. Investment in …….. financial assets is known as meeting of working capital requirements of the concern.

3.2 Long-term Sources of Finance

There are different sources of funds available to meet long-term financial needs of the business. These sources may be broadly classified into share capital (both equity and preference) and debt (including debentures, long-term borrowings or other debt instruments). In recent times in India, many companies have raised long-term finance by offering various instruments to public like deep discount bonds, fully convertible debentures, etc. These new instruments have characteristics of both equity and debt and it is difficult to categorize these either as debt or equity.

Notes

The different sources of long-term finance can now be discussed:

3.2.1 Owners' Capital or Equity

A public limited company may raise funds from promoters or from the investing public by way of owners' capital or equity capital by issuing ordinary equity shares. Ordinary shareholders are owners of the company and they undertake the risks inherent in business. They elect the directors to run the company and have the optimum control over the management of the company. Since equity shares can be paid off only in the event of liquidation, this source has the least risk involved. This is more so due to the fact that equity shareholders can be paid dividends only when there are distributable profits. However, the cost of ordinary shares is usually the highest. This is due to the fact that such shareholders expect a higher rate of return on their investment as compared to other suppliers of long-term funds. Further, the dividend payable on shares is an appropriation of profits and not a charge against profits. This means that it has to be paid only out of profits after tax.

Ordinary share capital also provides a security to other suppliers of funds. Thus, a company having substantial ordinary share capital may find it easier to raise further funds, in view of the fact that share capital provides a security to other suppliers of funds.



Did u know? **What are the governing acts for share capital?**

The Companies Act, 1956 and SEBI Guidelines for disclosure and investors' protections and the clarifications there to lay down a number of provisions regarding the issue and management of equity shares capital.

Advantages of raising funds by issue of equity shares are:

1. It is a permanent source of finance.
2. The issue of new equity shares increases flexibility of the company.
3. The company can make further issue of share capital by making a right issue.
4. There are no mandatory payments to shareholders of equity shares.

3.2.2 Preference Share Capital

These are a special kind of shares, the holders of such shares enjoy priority, both as regards to the payment of a fixed amount of dividend and repayment of capital on winding up of the company.

Long-term funds from preference shares can be raised through a public issue of shares. Such shares are normally cumulative i.e., the dividend payable in a year of loss gets carried over to the next year till there is an adequate profit to pay the cumulative dividends. The rate of dividend on preference shares is normally higher than the rate of interest on debentures, loans, etc. Most of preference shares these days carry a stipulation of period and the funds have to be repaid at the end of a stipulated period.

Preference share capital is a hybrid form of financing that partakes some characteristics of equity capital and some attributes of debt capital. It is similar to equity because preference dividend, like equity dividend is not a tax-deductible payment. It resembles debt capital because the rate of preference dividend is fixed. Typically, when preference dividend is skipped it is payable in future because of the cumulative feature associated with most of preference shares.

Cumulative Convertible Preference Shares (CCPs) may also be offered, under which the shares would carry a cumulative dividend of specified limit for a period of say three years, after which

Notes

the shares are converted into equity shares. These shares are attractive for projects with a long gestation period. For normal preference shares, the maximum permissible rate of dividend is 14%.

Preference share capital may be redeemed at a predefined future date or at an earlier stage inter alia out of the profits of the company. This enables the promoters to withdraw their capital from the company, which is now self-sufficient, and the withdrawn capital may be reinvested in other profitable ventures. It may be mentioned that irredeemable preference shares cannot be issued by any company.



Notes Preference shares have gained importance after the Finance Bill 1997 as dividends became tax exempted in the hands of the individual investor and are taxable in the hands of the company as tax is imposed on distributed profits at a flat rate. The Budget for 2000-01 has doubled the dividend tax from 10% to 20% besides a surcharge of 10%. The Budget for 2001-2002 has reduced the dividend tax from 20% to 10%. Many companies raised funds during 1997 through this route especially through private placement or preference shares, as the capital markets were not vibrant.

The advantages of taking the preference share capital route are:

1. No dilution in EPS on enlarged capital base – if equity is issued it reduces EPS, thus affecting the market perception about the company.
2. There is leveraging advantage as it bears a fixed charge.
3. There is no risk of takeover.
4. There is no dilution of managerial control.
5. Preference capital can be redeemed after a specified period.

3.2.3 Debentures or Bonds

Loans can be raised from public by issuing debentures or funds by public limited companies. Debentures are normally issued in different denominations ranging from ₹ 100 to ₹ 1,000 and carry different rates of interest. By issuing debentures, a company can raise long-term loans from public. Normally, debentures are issued on the basis of a debenture trust deed, which list the terms and conditions on which the debentures are floated. Debentures are normally secured against the assets of the company.

As compared with preference shares, debentures provide a more convenient mode of long-term funds. The cost of capital raised through debentures is quite low since the interest payable on debentures can be charged as an expense before tax. From the investors' point of view, debentures offer a more attractive prospect than the preference shares since interest on debentures is payable whether or not the company makes profits.

Debentures are, thus, instruments for raising long-term debt capital. Secured debentures are protected by a charge on the assets of the company. While the secured debentures of a well-established company may be attractive to investors, secured debentures of a new company do not normally evoke same interest in the investing public.

Advantages of raising finance by issue of debentures are:

1. The cost of debentures is much lower than the cost of preference or equity capital as the interest is tax deductible. Also, investors consider debenture investment safer than equity or preferred investment and, hence, may require a lower return on debenture investment.

Notes

2. Debenture financing does not result in dilution of control.
3. In a period of rising prices, debenture issue is advantageous. The fixed monetary outgo decreases in real terms as the price level increases.

The disadvantages of debenture financing are:

1. The protective covenants associated with a debenture issue may be restrictive
2. Debenture financing enhances the financial risk associated with the firm.

These days, many companies are issuing convertible debentures or bonds with a number of schemes/incentives like warrants/options etc. These bonds or debentures are exchangeable at the option of the holder for ordinary shares under specified terms and conditions. Thus, for the first few years these securities remain as debentures and later they can be converted into equity shares at a predetermined conversion price. The issue of convertible debentures has distinct advantages from the point of view of the issuing company. Firstly, such as issue enables the management to raise equity capital indirectly without diluting the equity holding, until the capital raised has started earning an added return to support the additional shares. Secondly, such securities can be issued even when the equity market is not very good. Thirdly, convertible bonds are normally unsecured and, therefore, their issuance may ordinarily not impair the borrowing capacity. These debentures/bonds are issued subject to the SEBI guidelines notified from time to time.

Public issue of debentures and private placement to mutual funds now require that the issue be rated by a Credit Rating Agency Like CRISIL (Credit Rating and Information Services at India Ltd.). The credit rating is given after evaluating factors like track record of the company, profitability, debt servicing capacity, credit worthiness and perceived risk of lending.



Caution Debenture interest and capital repayment are obligatory payments.

3.2.4 Types of Debentures

Debentures can be classified based on security against which it is placed and whether convertible into shares or not.

Non-Convertible Debentures (NCDs)

These debentures cannot be convertible into equity shares and will be redeemed at the end of the maturity period.



Example: ICICI offered for public subscription for cash at par ₹ 20,00,000, 16% unsecured redeemable bonds (Debentures) of ₹ 1000 each. These bonds are fully non-convertible (i.e., the investor is not given the option of converting into equity shares); interest payable half yearly on June 30 and December 31, to be redeemed (paid back) on the expiry of 5 years from the date of allotment. But ICICI has also allowed the investors, the option of requesting the company to redeem all or part of the bonds held by them on the expiry of 3 years from the date of allotment, provided the bond holders give the prescribed notice to the company.

Fully Convertible Debentures (FCDs)

These debentures will be converted into equity shares either fully at one stroke or in installments. The debentures may or may not carry interest till the date of conversion. The conversion will be

Notes

at a premium either fixed before hand or as per some formula. FCDs are very attractive to the investors as their bonds are converted into equity shares at a price, which actually in the market may be much higher.



Example: Let us look at the Jindal issue:

The total issue was 301,72,080 secured zero interest fully convertible debentures. Of these 129,30,000 FCDs of ₹ 60 each were offered to the existing shareholders of the company as right basis in the ratio of one FCD for every one fully paid equal share held as on 30th March of the year. The balance of 172,42,080 secured zero interest, FCD's were offered to the public at par value of ₹ 100 each.

The terms of conversion were: Each fully paid FCD's will be compulsorily converted into one equity shares of ₹ 10 each at a premium of ₹ 90 per share, credited as fully paid up, at the end of 12 months from the date of investment.

Partly Convertible Debentures (PCDs)

These are debentures or bonds, a portion of which will be converted into equity share capital after a specified period, whereas the non-convertible part (NCD) of PCD will be redeemed as per terms of the issue after the maturity period. The non-convertible portion of the PCD will carry interest up to redemption whereas the interest on the convertible portion will be only up to the date immediately preceding the date of conversion.

Normally, PCDs carry a lower rate of interest (coupon) as compared to NCDs.

This is a kind of NCD with an attached warrant that gives the holder the right for allotment of equity shares through cash payment. This right has to be exercised between certain time frame after allotment, by which time the SPN will be fully paid up.

3.2.5 New Financial Instruments

- ***Non-voting shares:*** Useful for companies to increase net worth without losing management control. These stocks are similar in every respect to equity, the sole exception being the absence of voting rights.
- ***Detachable equity warrants:*** This gives the holder the right to purchase a certain number of shares (equity) at a specified price over a certain period of time (of course holders of warrants earn no income from them, till the option is exercised or warrants are sold). Warrants are often attached to debt issues as 'sweetener'. When a firm makes a large bond issue the attachment of stock purchase warrants may add to the marketability of the issue and lower the required interest rate. A sweetener's warrants are similar to conversion features often when a new firm is raising its initial capital suppliers of debt will require warrants to permit them to participate in whatever success the firm achieves. In addition, established companies, offer warrants to debts to compensate for risk and thereby lower the interest rate/and/or provide for fewer restrictive covenants.
- ***Participating debentures:*** These are unsecured corporate debt securities that participate in the profits of the company. Potential issuers are existing dividend paying companies could appeal to investors willing to take risk for higher returns.
- ***Participating preference shares:*** Quasi equity instrument to bolster net worth without loss of management control payouts linked to equity dividend and also eligible for bonus will appeal to investors who are willing to take low risk.

Notes

- ***Convertible debentures with options:*** A derivative of the convertible debentures, with an embedded option, providing flexibility to the issues as well as the investor to exit from the terms of the issue. The coupon rate is specified at the time of issue.
- ***Third party convertible debenture:*** Debt with a warrant allowing the investor to subscribe to the equity of a third firm at a preferential price vis-à-vis the market price. Interest rate here is lower than pure debt on account of the conversion option.
- ***Mortgage backed securities:*** An instrument, otherwise known as the Asset Backed Security (ABS), for securitization of debt. An ABS is backed by pooled assets like mortgages, credit card receivables and the like.
- ***Convertible debentures redeemable at premium:*** Convertible debenture issued at face value with a 'put' option entitling investors to sell the bond later to the issuer at a premium. It serves a similar purpose as that of convertible debt, but risks to investors are lower.
- ***Debt equity swaps:*** An offer from the issue of debt to convert (swap) it for common share. The risk may dilute earnings per share in the case of the issues, the expect capital appreciation may not materialize in the case of investor.
- ***Zero coupon convertible note:*** A Zero Coupon Convertible Note (ZCCN) converts into common shares. If investors choose to convert, they forego all accrued and unpaid interest. The risk ZCCN prices are sensitive to interest rates.



Did u know? **What are floating rate bonds?**

The bonds in which the interest rate is not fixed and is allowed to float depending upon the market conditions. This has become very popular as a money market investment.

3.2.6 Loans from Financial Institutions

In India, specialized institutions provide long-term financial assistance to industry. Thus, the Industrial Finance Corporation of India, the State Financial Corporations, the Life Insurance Corporation of India, the National Small Industries Corporation Limited, the Industrial Credit and Investment Corporation, the Industrial Development Bank of India and the Industrial Reconstruction Corporation of India provide term loans to companies. Before a term loan is sanctioned, a company has to satisfy the concerned financial institution regarding the technical, commercial, economic, financial and managerial viability of the project for which the loan is required. Such loans are available at different rates of interest under different schemes of financial institutions and are to be repaid according to a stipulated repayment schedule.

Term loans represent secured borrowings and at present it is the most important source of finance for new projects. They generally carry a rate of interest inclusive of interest tax, depending on the credit rating of the borrower, the perceived risk of lending and the cost of funds. These loans are generally repayable over a period of 6 to 10 years in annual, semi-annual or quarterly installments.

Term loans are also provided by banks. State financial/development institutions and all-India term lending financial institutions. Banks and State Financial Corporations normally provide term loans to projects in the small scale sector, while for the medium and large industries, term loans are provided by state developmental institutions alone or in consortium with banks and State-Financial Corporations. For large scale projects all-India financial institutions provide the bulk of term finance either singly or in consortium with other all-India financial institutions, state level institutions and/or banks.

Notes

After Independence, the institutional setup in India for the provision of medium and long-term credit for industry has been broadened. The assistance sanctioned and disbursed by these specialized institutions has increased impressively over the years. A number of specialized institutions have been established all over the country.



Caution The loans in many cases stipulate a number of conditions regarding the management and certain other financial policies of the company.

3.2.7 Internal Accruals

This basically means what is being ploughed back in business i.e., retained earnings and the depreciation charge. While depreciation is used for replacing an old machinery etc., retained earnings can be used, for finding other long-term requirements of the business. The major advantage of using this as a source of long-term finance are its easy availability, elimination of issue expenses and avoiding the problem of dilution of control (with equity source of fund). The disadvantage of this source is limited funds from this source, plus foregoing of dividends receipts may lead to higher opportunity costs for the firm.



Task Which of the following do you think is costliest of long-term sources of finance? Give reasons to support your answer.

(a) Preference Share Capital

(b) Retained Earnings

(c) Equity Share Capital

(d) Debentures

(e) Capital raised through private placement.

Self Assessment

Fill in the blanks:

3. Ordinary shareholders are owners of the company and they undertake the ……. inherent in business.
4. Long-term funds from preference shares can be raised through a …….. of shares.
5. A Zero Coupon Convertible Note (ZCCN) converts into…….. .

3.3 Issue of Securities

A firm can raise capital from the primary market (both domestic and foreign) by using securities in the following ways:

- Public issue
- Rights issue
- Private placement
- Bought out deals
- Euro issues

Notes

The apex body regulating the Indian securities market and the companies raising finance from it is the Securities and Exchange Board of India (SEBI). After the repeal of Capital Issues Control Act, 1947 in May 1992, SEBI was given the statutory powers to regulate the securities market.

3.3.1 Public Issue

Companies issue securities in the public in the primary market and get them listed in the stock exchange. The major activities in making a public issue of securities are as below:

- The firm should appoint a SEBI registered category I Merchant Banker to manage the issues. The lead manager will be responsible for all the pre and post issue activities, liaison with the other intermediaries, and statutory bodies like SEBI, Stock Exchange and the Register of Companies (ROC) and finally ensure that securities are listed on the Stock Exchange.
- The other intermediaries involved in the public issue of securities are underwriters, registrars, and bankers to the issues, brokers and advertising agencies. It also involves promotion of the issue, printing and dispatch of prospectus and application form, obtaining statutory clearances, filing the initial listing application, final allotment and refund activities. The cost of issue ranges between 12-15% of the issue size and may go up to 20% in adverse market conditions.

3.3.2 Rights Issue

As per Section 81 of the Companies Act, 1956, when a firm issues additional equity capital it has to first offer such securities to the existing shareholders in a prorate basis. The company must give notice of maximum 14 days to each of the equity shareholders giving him the option to take the shares offered to him by the company against payment of specified money per share. The shareholder unless the articles otherwise provide, have the right to renounce the offer, in whole or in part, in favour of some others who need not be a member of the company. The cost of floating right issue is comparatively less than the public issue. Since marketing costs and other public issue expenses are avoided as the offer is made to the existing shareholders. The rights issue is also priced lower than the public issue.

3.3.3 Private Placement

The private placement method involves direct selling of securities to a limited number of institutional or high net worth investors. This avoids delay involved in going public and also reduces the expenses involved in public issue. The company appoints a merchant banker to network with the institutional investor and negotiate the price of the issue. The major advantages of private placement securities are:

- Easy access to any company
- Fewer procedural formalities
- Access to funds is faster
- Lower cost involved in issues
- Securities can be custom-tailored for firms with special problems or opportunities

3.3.4 Bought out Deals

Bought out is a process whereby a investor or group of investors buy out a significant portion of the equity of an unlisted company with a view to sell the same to public within an agreed time

Notes

frame. The company places the equity shares, to be offered to the public with a sponsor or the Merchant Banker. At the right time, the shares are off loaded to the public through the OTCEI route or by way of public issue and the funds reach the company without much delay. Further, it affords greater flexibility in terms of issue and matters relating to offloading. Major advantages of entering into a bought out deal are:

- Companies both existing and new, which do not satisfy conditions laid down by SEBI for premium issues, may issue at a premium through this route.
- The procedural complexities are reduced, and funds reach faster upfront. Added to this there is significant reduction in issue cost.
- An advantage accruing to the investor is that the issue price reflects the company's intrinsic value.



Task A company is in dire need for funds but lost the confidence of its shareholders due to the inadequate return on investments. Which of the following methods is/are suitable to that company to raise funds? Why?

(a) Public issue

(b) Rights issue

(c) Private placement

(d) Bought out deals

3.3.5 Euro Issues

The Government of India as a part of liberalization and deregulation of industry and to augment the financial resources of Indian companies, has allowed the companies to directly tap foreign resources for their requirements. The liberalized measures have boosted the confidence of foreign investors and also provided an opportunity to Indian companies to explore the possibility of tapping the European Market for their financial requirements. Where the resources are raised through the mechanism of Euro Issues i.e., Global Depository Receipts (GDRs), Foreign Currency Convertible Bonds (FCCB) and pure debt bonds. These investments are issued abroad and listed and traded as a foreign stock exchange. Once they are converted into equity, the underlying shares are listed and traded on the domestic exchange.

GDRs are created when the rising company delivers ordinary shares issued in the name of overseas depository bank (depository) to the domestic custodian bank (who is an agent of the depository) against which the depository issues GDRs representing the underlying equity shares to the foreign investors. The physical possession of the shares remains with the depository and the respective foreign investors obtain GDRs from the depository evidencing their holding. The main advantage of the issue is that there is an inflow of foreign exchange through the proceeds of the issue whereas the dividend outflow is in Indian rupees. The Department of Economic Affairs, Ministry of Finance has given detailed Guidelines Regarding Issue of GDRs. GDRs can be treated freely among non-resident investors like any other dollar-dominated security either on a foreign exchange market or in the OTC market.

Foreign currency convertible bond is an equity-linked unsecured debt instrument carrying a fixed rate of interest and an option of conversion into fixed number of equity shares or GDRs of the issuer company. However, the option to retain FCCB as a bond also exists. As a bond, the issuer has the responsibility to repay the principal amount and make the specified interest

Notes

payment for the given period. These bonds are listed and traded on one or more such exchanges abroad till conversion interest and well as redemption is paid in dollars or freely convertible currency.

Self Assessment

Fill in the blanks:

6. The private placement method involves …….. selling of securities to a limited number of institutional or high net worth investors.
7. Foreign currency convertible bond is an equity-linked unsecured ……. instrument carrying a fixed rate of interest.

3.4 Sources of Short-term Finance

3.4.1 Trade Credit

Trade credit refers to the credit extended by the supplier of goods or services to his/her customer in the normal course of business. Trade credit occupies very important position in short-term financing due to the competition. Almost all the traders and manufacturers are required to extend credit facility (a portion), without which there is no possibility of staying back in the business. Trade credit is a spontaneous source of finance that arises in the normal business transactions of the firm without specific negotiations (automatic source of finance). In order to get this source of finance, the buyer should have acceptable and dependable credit worthiness and reputation in the market. Trade credit generally extended in the format open account or bills of exchange. Open account is the form of trade credit, where supplier sends goods to the buyer for the payment to be received in future as per terms of the sales invoice. As such trade credit constitutes a very important source of finance; it represents 25 per cent to 50 per cent of the total short-term sources for financing working capital requirements.

Getting trade credit may be easy to the well-established or well-reputed firm, but for a new or the firm with financial problems will generally face problem in getting trade credit. Generally suppliers look for earning record, liquidity position and payment record which is extending credit. Building confidence in suppliers is possible only when the buyer discussing his/her financial condition future plans and payment record. Trade credit involves some benefits and costs.

Advantages of Trade Credit

The main advantages are:

1. Easy availability when compared to other sources of finance (except financially weak companies).
2. Flexibility is another benefit, as the credit increases with the growth of the firm's sales.
3. Informality as we have already seen that it is an automatic finance.

The above discussion on trade credit reveals two things. One, cost of trade credit is very high beyond the cash discount period, company should not have cash discount for prompt payment and Second, if the company is not able to avail cash discount it should pay only at the end of last day of credit period, even if it can delay by one or two days, it does not affect the credit standing.

Notes

3.4.2 Bridge Finance

Bridge finance refers to loans taken by a company normally from commercial banks for a short period, pending disbursement of loans sanctioned by financial institutions. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short-term loans from commercial banks. Bridge loans are also provided by financial institutions pending the signing of regular term loan agreement, which may be delayed due to non-compliance of conditions stipulated by the institutions while sanctioning the loan. The bridge loans are repaid/adjusted out of the term loans as and when disbursed by the concerned institutions. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

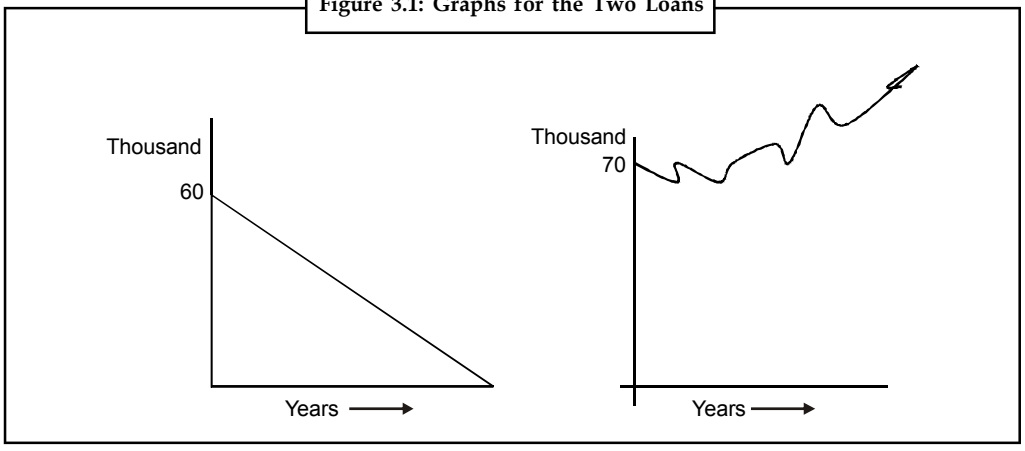
3.4.3 Loans from Commercial Banks

The primary role of the commercial bank is to short-term requirements of industry. Of late, however, banks have started taking an interest in term financing of industries in several ways, though the formal term lending is so far small and is confined to major banks only.

Term lending by banks has become a controversial issue these days. It has been argued that term loans do not satisfy the canon of liquidity, which is a major consideration in all bank operations. According to the traditional values, banks should provide loans only for short periods and for operations, which result in the automatic liquidation of such credits over short periods. On the other hand, it is contended that the traditional concept of liquidity requires to be modified. The proceeds of the term loan are generally used for what are broadly known as fixed assets or for expansion in plant capacity. Their repayment is usually scheduled over a long period of time. The liquidity of such loans is said to depend on the anticipated income of the borrowers.

As a matter of fact, a working capital loan is more permanent and long-term than a term loan. The reason for making this statement is that a term loan is always repayable on a fixed date and ultimately, a day will come when the account will be totally adjusted. However, in the case of working capital finance, though it is payable on demand, yet in actual practice it is noticed that the account is never adjusted as such, and, if at all the payment is asked back, it is with a clear purpose and intention of refinance being provided at the beginning of the next year or half year. To illustrate this point let us presume that two loans are granted on January 1, 1996 (a) to A; term loan of ₹ 60,000 for 3 years to be paid back in equal half yearly installments, and (b) to B; cash-credit limit against hypothecation, etc. of ₹ 60,000. If we make two separate graphs for the two loans, they may be something like the figure shown below.

Figure 3.1: Graphs for the Two Loans



Notes



Notes It has been presumed that both the concerns are good. Payment of interest has been ignored. It has been presumed that cash credit limit is being enhanced gradually.

The above graphs clearly indicate that at the end of 1999 the term loan would be fully settled whereas the cash credit limit might have been enhanced to over a lakh of rupees. It really amounts to providing finances for the long-term.

This technique of providing long-term finance can be technically called "rolled over for periods exceeding more than one year". Therefore, instead of indulging in term financing by the rolled over method, banks can and should extend credit term after proper appraisal of applications for terms loans. In fact, as stated above, the degree of liquidity in the provision for regular amortization of term loans is more than some of these so-called demand loans that are renewed from year-to-year. Actually, term financing disciplines both the banker and borrower as long-term planning is required to ensure that cash inflow would be adequate to meet the instruments of repayments and allow an active turnover of bank loans. The adoption of the formal term loan lending by commercial banks will not in any way hamper the criteria of liquidity and as a matter of fact, it will introduce flexibility in the operations of the banking system.

The real limitation to the scope of bank activities in this field is that all banks are not well equipped to make appraisal of such loan proposals. Term loan proposals involve an element of risk because of changes in the conditions affecting the borrower. The bank making such a loan, therefore, has to assess the situation to make a proper appraisal. The decision in such cases would depend on various factors affecting the conditions of the industry concerned and the earning potential the borrower.

3.4.4 Commercial Papers (CPs)

Commercial paper represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating. It was first introduced in USA and it was an important money market instruments. In India, Reserve Bank of India introduced CP on the recommendations of the Vaghul Working Group on money market. CP is a source of short-term finance to only large firms with sound financial position.

Features of CP

1. The maturity period of CP ranges from 15 to 365 day (but in India it ranges between 91 to 180 days).
2. It is sold at a discount from its face value and redeemed at its face value.
3. Return on CP is the difference between par value and redeemable value.
4. It may be sold directly to investors or indirectly (through) dealers.
5. There is no developed secondary market for CP.

Eligibility Criteria for Issuing CP

CP is unsecured promissory note, the issue of CP is being regulated by the Reserve Bank of India. RBI has laid down the following conditions to determine the eligibility of a company that wishes to raise funds through the issue of CPs.

1. The Tangible Net Worth (TNW) of the company, as per latest audited balance sheet should not be less than ₹ 4 crore.

Notes

2. The company should have been sanctioned as a fund based limit for bank(s) finance and/ or the All India Financial Institutions.
3. Company can issue CPs amounting to 75% of the permitted bank (working capital limit) credit.
4. Company's CPs receives a minimum rating of (P2 from CRISIL, A-2 form ICRA, etc.).
5. The minimum size of each CP is ₹ 5 lakhs or multiples thereof.
6. The size of any single issue should not be less than ₹ 1 crore.
7. The CP is in the form of usance promissory note negotiable by endorsement and delivery.

Advantages of CP

1. It is an alternative source of finance and proves to be helpful during the period of tight bank credit.
2. It is a cheaper source of short-term finance when compared to the bank credit.

Disadvantage of CP

It is available only for large and financially sound companies.


Caution Commercial Paper (CP) cannot be redeemed before the maturity date.

3.4.5 Inter-corporate Deposits (ICDs)

A deposit made by one firm with another firm is known as Inter-corporate Deposits (ICDs). Generally, these deposits are usually made for a period up to six months. Such deposits may be of three types:

1. ***Call Deposits:*** Deposits are expected to be payable on call. In other words, whenever its repayment is demanded on just one days notice. But, in actual practice, the lender has to wait for at least 2 or 3 days to get back the amount. Inter corporate deposits generally have 12 per cent interest per annum.
2. ***Three Months Deposits:*** These deposits are more popular among companies for investing the surplus funds. The borrower takes this type of deposits for tiding over a short-term cash inadequacy. The interest rate on these types of deposits is around 14 per cent per annum.
3. ***Six Months Deposits:*** Generally, the inter-corporate deposits are made for a maximum period of six months. These types of deposits are usually given to 'A' category borrowers only and they carry an interest rate of around 16% per annum.

Features of ICDs

1. There are no legal regulations, which make an ICD transaction very convenient.
2. Inter-corporate deposits are given and taken in secrecy.
3. Inter-corporate deposits are given based on borrower's financial sound, but in practice lender lends money based on personal contacts.

Self Assessment

Notes

Fill in the blanks:

8. ……. refers to loans taken by a company normally from commercial banks for a short period, pending disbursement of loans sanctioned by financial institutions.
9. Commercial paper represents a short-term ……. promissory note issued by firms that have a fairly high credit rating.

3.5 Venture Capital Financing

The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas. In a broad sense, under venture capital financing, venture capitalists make investments to purchase equity or debt securities from inexperienced entrepreneurs, who undertake highly risky ventures with a potential of success.

Methods of Venture Capital Financing

The venture capital industry in India is just a decade old. The venture capitalist generally finance ventures, which are in national priority areas such as energy conservation, quality upgradation, etc. In November 1988, the Government of India issued the first set of guidelines for venture capital companies' funds and made them eligible for capital gain concessions. In 1995, certain new clauses and amendments were made in the guidelines. These guidelines require the venture capitalists to meet the requirements of different statutory bodies and this makes it difficult for them to operate as they do not have much flexibility in structuring investments. In 1999, the existing guidelines were relaxed for increasing the attractiveness of the venture schemes and induce high net worth investors to commit their funds to 'sunrise' sectors particularly the information technology sector.

Initially, the contribution to the funds available for venture capital investment in the country was from the all-India development financial institutions, state development financial institutions, commercial banks and companies in private sector. In the last couple of years, many offshore funds have been started in country and the maximum contribution is from foreign institutional investors. A few venture capital companies operate as both investment and fund management companies, while other set up funds and function as asset management companies.

It is hoped that the changes in the guidelines for the implementation of venture capital schemes in the country would encourage more funds to be set up to provide the required momentum for venture capital investment in India.

Some common methods of venture capital financing are as follows:

1. ***Equity financing:*** The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remain with the entrepreneur.
2. ***Conditional loan:*** A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, riskiness and other

Notes

factors of the enterprise. Some venture capital financiers give a choice to the enterprise of paying a high rate of interest (which could be well above 20 per cent) instead of royalty on sales, once it becomes commercially sounds.

3. ***Income note:*** It is a hybrid security, which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80-87.50% of the projects cost for commercial application of indigenous technology.

4. ***Participating debenture:*** Such security carries charges in three phases - in the start-up phase, no interest is charged, in next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.

Self Assessment

Fill in the blanks:

10. A …….. loan is repayable in the form of a royalty after the venture is able to generate sales.

11. …….. is a hybrid security, which combines the features of both conventional loan and conditional loan.

3.6 Leasing and Hire Purchase as a Source of Finance

A lease is a contractual arrangement under which the owner of an asset (called the lessor) agrees to allow the case of its asset by another party (lessee) in exchange of periodic payments (lease-rental) for a specified period. The lessee pays the lease rent as a fixed payment over a period of time at the beginning or at the end of a month, quarter, half year or year. Although generally fixed, lease rents can be tailored both in terms of amount and tuning to the profits and cash flow position of the lessee. At the end of the lease contract, the asset reverts back to the real owner i.e., the lessor. However, in long-term lease contract, the lessee is generally given the option to buy or renew the lease.

Lease agreements are divided into two major ones – operating lease and financial lease.

Operating lease is for periods shorter than the useful life of the asset and is cancelable at the option of the lessee. On the other hand, financial lease involves a relatively longer-term commitment on the part of the lessee and non-cancelable during the entire period specified in the contract. Operating lease is common among equipments/assets exposed to technological obsolescence such as computers, data processing equipments.

Financial leases are commonly used for leasing land, buildings and large pieces of fixed equipments.

Advantages of Leasing

1. Shifting the risk of technological obsolescence to the owner (lessor) the leasing company.

2. ***Easy source of finance:*** A lessee (user of the machine) avoids many of the restrictive covenants that are normally in the long-term loan agreements while borrowing from financial institution or commercial banks.

3. ***Enhance liquidity:*** A firm having shortage of working capital or forecasting liquidity problem may exercise the option of the selling the owned asset to a lesser (leasing company) and take it back on lease basis (the transaction is known as sale cum lease back).

4. Conserving borrowing capacity through off the balance-sheet financing.

Notes

5. Improved performance as reflected through improved turnover of assets.
6. Governance and flexibility-by adjusting the term based on losses) requirements.
7. ***Maintenance and specialized services:*** Under a full service lease, the lessee receives maintenance and other specialized services. Even in other types of lease, it is generally common to have maintenance provided by the lessor, thus absolving the lessee of the maintenance arrangement.
8. Lower administrative cuts as compared to other source of finance.

Disadvantages

1. Risk of being deprived of the use of equipment of the lessors (owners) financial condition worsens, or if the leasing company is worried up, the lessee may be deprived of the use of the equipment thus disrupting normal manufacturing operations.
2. ***Alteration/change in the asset:*** Under the lease, the lessee is generally prohibited from making alterations/improvements on the leased asset without the prior approval of the lessor (the owner).
3. ***Terminal value of the asset:*** In case of assets (such as land and buildings), which have high terminal value at the end of the lease term, it would be more appropriate to own the asset than to lease it.
4. To make lease payments even if the asset has become obsolete. If a lessee leases an asset that subsequently becomes obsolete, it still must make lease payments over the remaining term of the lease. This is true even if the asset is unsalable.

Hire Purchase

Very similar to leasing is hire purchase except that in hire purchase, the ownership will be transferred to the buyer after all the hire purchase installments are paid up. With many non-banking finance companies offering the leasing and hire purchase of equipments, many companies are opting for this route to finance their fixed assets.

Self Assessment

Fill in the blanks:

12. Lease agreements are divided into two major ones – operating lease and ……lease.
13. …….. lease is for periods shorter than the useful life of the asset and is cancelable at the option of the lessee.

3.7 Deferred Credit

The deferred credit facility is offered by the suppliers of machinery, whereby the buyer can pay the purchase price in installments spread over a period of time. The interest and repayment period are negotiated between the supplier and the buyer.



Notes Bill rediscounting scheme, supplier's line of credit, seed capital assistance and risk capital foundation schemes offered by financial institutions are examples of deferred credit scheme.

Notes

3.7.1 Capital Assistance Seed

The seed capital assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits. The project cost should not exceed ₹ 2 crores and the maximum assistance under the project will be restricted to 50% of the required promoters contribution or ₹ 15 lacs whichever is lower.

The seed capital assistance is interest free but carries a service charge of 1% for the first five year and 10% p.a. thereafter. However, IDBI will have the option to change interest at such rate as may be determined by IDBI based on the financial position and profitability of the company. The repayment schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium up to five years.

For projects with a project cost exceeding ₹ 200 lacs, seed capital may be detained from the Risk Capital and Technology Corporation Ltd. (RCTC). For small projects costing up to ₹ 5 lacs, assisted under the Natural Equity Fund of SIDBI may be availed.

3.7.2 Government Subsidies

The central and state governments provide subsidies to industrial units located in backward areas. The central government has classified backward areas into three categories of districts: A, B and C. The central subsidies applicable to industrial projects in these districts are:

1. Category A Districts-25% of the fixed capital investment subject to a maximum of ₹ 25 lakh
2. Category B Districts-15% of the fixed capital investment subject to a maximum of ₹ 15 lakh
3. Category C Districts-10% of the fixed capital investment subject to a maximum of ₹ 10 lakh.

State governments also offer cash subsidies to promote widespread dispersal of industries within their states. Generally, the districts notified in the state subsidy schemes are different from those covered under the central subsidy scheme. The state subsidies vary between 5% to 25% of the fixed capital investment in the project, subject to a ceiling varying between ₹ 5 lakh and ₹ 25 lakh depending on the location.



Example: Satavahana Ispat Limited has been set up with the capacity to manufacture 1,20,000 tones of pig iron. The cost of project has been appraised by IDBI at ₹ 5,450 lakh and is to be mainly financed through equity capital and term loans. The unit is also eligible for a state government subsidy (Andhra Pradesh) of ₹ 20 lakh, which will also be a source of long-term finance. The unit is located at Anantapur district of Andhra Pradesh and falls into" the Category of a 'backward area.'

3.7.3 Sales Tax Deferments and Exemptions

To attract industries, the state provides incentives, in the form of sales tax deferments and sales tax exemptions. Under the sales tax deferment scheme, the payment of sales tax on the sale of finished goods may be deferred for a period ranging between five to twelve years. Essentially, it implies that the project gets an interest-free loan, represented by the quantum of Sales Tax deferment period.



Notes Under the sales tax exemption scheme, some states exempt the payment of sales tax applicable on purchase of raw materials, consumables, packing and processing materials from within the state while used for manufacturing purposes. The period of exemption ranges from three to nine years depending on the state and the specific location of the project within the state.

Notes

Lupin Chemicals Ltd. has stated in their prospects that they are eligible for sales tax incentive for a period of five years or till they reach the ceiling of 60% of fixed capital investment whichever is earlier.

Self Assessment

Fill in the blanks:

14. The seed capital assistance scheme is designed by ..... for professionally or technically qualified entrepreneurs.

15. The central and state governments provide subsidies to industrial units located in ..... areas.



Caselet

NHAI to Raise ₹ 10,000 cr from Tax-free Bonds

The National Highways Authority of India has decided to launch its first ever tax-free bonds issue of ₹ 5,000 crore on December 28, with a face value of ₹ 1,000 each.

The Highways authority plans to raise ₹ 10,000 crore through the issue, which will remain open till January 11, 2012.

These bonds will have a tenure of 10 years and 15 years, respectively. The 10-year bonds will give 8.2 per cent interest annually, while the 15-year bonds would offer 8.3 per cent interest. The interest would be payable annually on October 1 of each year. The bonds are proposed to be listed on the BSE and NSE.

Safe Investment Option

The Minister of Road Transport and Highways, Mr C.P Joshi, said: "These bonds are being offered across three categories of retail investors, high networth investors and institutional investors.

Thirty per cent of the bonds would be for those who want to invest ₹ 5 lakh and below, another 30 per cent for those who want to invest₹ 5 lakh and above and the remaining 40 per cent for institutional investors." The issue comes with an option to close earlier or extend up to a maximum period of 30 days at the discretion of the board of NHAI, subject to necessary approvals. However, the issue shall remain open for a minimum of three days.

"Apart from being a safe investment option, the interest earned on these bonds would not be taxed and there would be no holding period restrictions as well. The funds realised would be utilised for part financing of the various NHAI projects," he added.

According to Mr Gajendra Haldea, Advisor to the Deputy Chairman, Planning Commission, infrastructure investment has risen sharply in India and much of the incremental push has come from the private sector.

"Investment in infrastructure has more than doubled in the five-year period to $470-480 billion from $230 billion.

"We see this figure rising to $1 trillion according to the 12{+t}{+h} Plan projection and 50 per cent of the total investment would come from the private sector. To achieve this, the sources of finance need to increase and the bond market will play an important role."

Source: http://www.thehindubusinessline.com/markets/stock-markets/article2742185.ece

Notes

3.8 Summary

- Financial needs of a business: The financial needs of a business may be grouped into three categories which are Long-term, Medium-term and Short-term financial needs.
- Long-term Sources of finance of a business include Share capital, Debentures/Bonds of different types, Loans from financial institutions and Venture capital funding.
- Short-term Sources of finance includes Trade credit, Commercial banks, Fixed deposits for a period of 1 year or less, Advances received from customers and Various short-term provisions.
- In recent times in India, many companies have raised long-term finance by offering various instruments to public like deep discount bonds, fully convertible debentures, etc.
- In India, specialized institutions provide long-term financial assistance to industry.
- Bridge finance refers to loans taken by a company normally from commercial banks for a short period, pending disbursement of loans sanctioned by financial institutions.
- CP is a source of short-term finance to large firms with sound financial position.
- The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas.
- A lease is a contractual arrangement under which the owner of an asset agrees to allow the case of its asset by another party in exchange of periodic payments (lease-rental) for a specified period.
- The seed capital assistance is interest free but carries a service charge of 1% for the first five year and 10% p.a. thereafter.

3.9 Keywords

Commercial Paper: It represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating.

Income note: It is a hybrid security, which combines the features of both conventional loan and conditional loan.

Inter-corporate Deposits (ICDs): A deposit made by one firm with another firm is known as Inter-corporate Deposits.

Retained Earnings: These are the portion of earning available to equity shareholders, which are ploughed back in the company.

Trade Credit: It refers to the credit extended by the supplier of goods or services to his/her customer in the normal course of business.

3.10 Review Questions

1. Explain the advantages of equity financing.
2. What are the advantages of debt financing from the point of the company and investors?
3. What do you mean by venture capital financing and what are the methods of this type of financing?

Notes

4. Write short notes on:
   (a) Zero interest fully convertible
   (b) Deep discount bonds
   (c) Inflation bonds
   (d) Sales tax deferments and Exemptions.
5. What are the advantages of lease financing?
6. "Is Trade Credit is source of working capital finance". Discuss.
7. Taking the example of the Indian corporate, analyse the importance of issuing the CPs for the firm and to the investors.
8. Do you agree that lease is the efficient source of finance for corporates? How?
9. In your opinion, which is the best source of finance available to the firm for raising money from the public?
10. You are starting your new company and wanted to raise capital from public. Analyse the sources of finance available to you.

Answers: Self Assessment

1.	5-10	2.	short-term
3.	risk	4.	public issue
5.	common shares	6.	direct
7.	debt	8.	Bridge finance
9.	unsecured	10.	conditional
11.	Income note	12.	financial
13.	Operating	14.	IDBI
15.	backward		

3.11 Further Readings



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Unit 4: Risk and Return Analysis

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4.6 Portfolio and Security Returns

4.7 Return and Risk of Portfolio

4.7.1 Return of Portfolio (Two Assets)

4.7.2 Risk of Portfolio (Two Assets)

4.7.3 Risk and Return of Portfolio (Three Assets)

4.8 Portfolio Diversification and Risk

4.9 Summary

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Objectives

After studying this unit, you will be able to:

- Differentiate between systematic and non-systematic return;
- Recognize the use of 'Beta' in estimating returns;
- Learn how to measure risk and return of portfolio.

Introduction

Risk can be defined as the probability that the expected return from the security will not materialize. Every investment involves uncertainties that make future investment returns risk-prone. Uncertainties could be due to the political, economic and industry factors.

Risk could be systematic in future depending upon its source. Systematic risk is for the market as a whole, while unsystematic risk is specific to an industry or the company individually.

Notes

The first three risk factors discussed below are systematic in nature and the rest are unsystematic. Political risk could be categorised depending on whether it affects the market as whole, or just a particular industry.

4.1 Types of Investment Risk

Systematic versus Non-systematic Risk

Modern investment analysis categorizes the traditional sources of risk causing variability in returns into two general types: those that are pervasive in nature, such as market risk or interest rate risk, and those that are specific to a particular security issue, such as business or financial risk. Therefore, we must consider these two categories of total risk. The following discussion introduces these terms. Dividing total risk into its two components, a general (market) component and a specific (issuer) component, we have systematic risk and non-systematic risk, which are additive:

Total risk = General risk + Specific risk

= Market risk + Issuer risk

= Systematic risk + Non-systematic risk

Systematic Risk: An investor can construct a diversified portfolio and eliminate part of the total risk, the diversifiable or non-market part. What is left is the non-diversifiable portion or the market risk. Variability in a security's total returns that is directly associated with overall movements in the general market or economy is called systematic (market) risk.

Virtually all securities have some systematic risk, whether bonds or stocks, because systematic risk directly encompasses interest rate, market, and inflation risks. The investor cannot escape this part of the risk because no matter how well he or she diversifies, the risk of the overall market cannot be avoided. If the stock market declines sharply, most stocks will be adversely affected; if it rises strongly, as in the last few months of 1982, most stocks will appreciate in value. These movements occur regardless of what any single investor does. Clearly, market risk is critical to all investors.

Non-systematic Risk: The variability in a security's total returns not related to overall market variability is called the non-systematic (non-market) risk. This risk is unique to a particular security and is associated with such factors as business and financial risk as well as liquidity risk. Although all securities tend to have some non-systematic risk, it is generally connected with common stocks.



Caution ***Remember the difference:*** Systematic (market) risk is attributable to broad macro factors affecting all securities. Non-systematic (non-market) risk is attributable to factors unique to a security.

Different types of systematic and non-systematic risks are explained as under:

1. ***Market Risk:*** The variability in a security's returns resulting from fluctuations in the aggregate market is known as market risk. All securities are exposed to market risk including recessions, wars, structural changes in the economy, tax law changes and even changes in consumer preferences. Market risk is sometimes used synonymously with systematic risk.

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2. ***Interest Rate Risk:*** The variability in a security's return resulting from changes in the level of interest rates is referred to as interest rate risk. Such changes generally affect securities inversely; that is, other things being equal, security prices move inversely to interest rates. The reason for this movement is tied up with the valuation of securities. Interest rate risk affects bonds more directly than common stocks and is a major risk that all bondholders face. As interest rates change, bond prices change in the opposite direction.

3. ***Purchasing Power Risk:*** A factor affecting all securities is purchasing power risk, also known as inflation risk. This is the possibility that the purchasing power of invested dollars will decline. With uncertain inflation, the real (inflation-adjusted) return involves risk even if the nominal return is safe (e.g., a Treasury bond). This risk is related to interest rate risk, since interest rates generally rise as inflation increases, because lenders demand additional inflation premiums to compensate for the loss of purchasing power.

4. ***Regulation Risk:*** Some investments can be relatively attractive to other investments because of certain regulations or tax laws that give them an advantage of some kind. Municipal bonds, for example, pay interest that is exempt from local, state and federal taxation. As a result of that special tax exemption, municipals can price bonds to yield a lower interest rate since the net after-tax yield may still make them attractive to investors. The risk of a regulatory change that could adversely affect the stature of an investment is a real danger. In 1987, tax law changes dramatically lessened the attractiveness of many existing limited partnerships that relied upon special tax considerations as part of their total return. Prices for many limited partnerships tumbled when investors were left with different securities, in effect, than what they originally bargained for. To make matters worse, there was no extensive secondary market for these illiquid securities and many investors found themselves unable to sell those securities at anything but 'fire sale' prices if at all.

5. ***Business Risk:*** The risk of doing business in a particular industry or environment is called business risk. For example, as one of the largest steel producers, U.S. Steel faces unique problems. Similarly, General Motors faces unique problems as a result of such developments as the global oil situation and Japanese imports.

6. ***Reinvestment Risk:*** The YTM calculation assumes that the investor reinvests all coupons received from a bond at a rate equal to the computed YTM on that bond, thereby earning interest on interest over the life of the bond at the computed YTM rate. In effect, this calculation assumes that the reinvestment rate is the yield to maturity.

   If the investor spends the coupons, or reinvests them at a rate different from the assumed reinvestment rate of 10%, the realized yield that will actually be earned at the termination of the investment in the bond will differ from the promised YTM. And, in fact, coupons almost always will be reinvested at rates higher or lower than the computed YTM, resulting in a realized yield that differs from the promised yield. This gives rise to reinvestment rate risk. This interest-on-interest concept significantly affects the potential total dollar return. Its exact impact is a function of coupon and time to maturity, with reinvestment becoming more important as either coupon or time to maturity, or both, rise, specifically:

   (a) Holding everything else constant, the longer the maturity of a bond, the greater the reinvestment risks.

   (b) Holding everything else constant, the higher the coupon rate, the greater the dependence of the total dollar returns from the bond on the reinvestment of the coupon payments.

   Let's look at realised yields under different assumed reinvestment rates for a 10% non-callable 20-year bond purchased at face value. If the reinvestment rate exactly equals the YTM of 10%, the investor would realize a 10% compound return when the bond is held

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to maturity, with $4,040 of the total dollar return from the bond attributable to interest-on-interest. At a 12% reinvestment rate, the investor would realize an 11.14% compound return, with almost 75% of the total return coming from interest-on-interest ($5,738/$7,738). With no reinvestment of coupons (spending them as received), the investor would achieve only a 5.57% return. In all cases, the bond is held to maturity.

Clearly, the reinvestment portion of the YTM concept is critical. In fact, for long-term bonds the interest-on-interest component of the total realized yield may account for more than three-fourths of the bond's total dollar return.

7. ***Bull-bear Market Risk:*** This risk arises from the variability in the market returns resulting from alternating bull and bear market forces. When security index rises fairly consistently from a low point, called a trough, over a period of time, this upward trend is called a bull market. The bull market ends when the market index reaches a peak and starts a downward trend. The period during which the market declines to the next trough is called a bear market.

8. ***Management Risk:*** Management, all said and done, is made up of people who are mortal, fallible and capable of making a mistake or a poor decision. Errors made by the management can harm those who invested in their firms. Forecasting errors is difficult work and may not be worth the effort and, as a result, imparts a needlessly sceptical outlook.

   An agent-principal relationship exists when the shareholder owners delegate the day-to-day decision-making authority to managers who are hired employees rather than substantial owners. This theory suggests that owners will work harder to maximize the value of the company than employees will. Various researches in the field indicate that investors can reduce their losses to difficult-to-analyse management errors by buying shares in those corporations in which the executives have significant equity investments.

9. ***Default Risk:*** It is that portion of an investment's total risk that results from changes in the financial integrity of the investment.



Example: When a company that issues securities moves either further away from bankruptcy or closer to it, these changes in the firm's financial integrity will be reflected in the market price of its securities. The variability of return that investors experience, as a result of changes in the credit worthiness of a firm in which they invested, is their default risk.

Almost all the losses suffered by investors as a result of default risk are not the result of actual defaults and/or bankruptcies. Investor losses from default risk usually result from security prices falling as the financial integrity of a corporation's weakness – market prices of the troubled firm's securities will already have declined to near zero. However, this is not always the case – 'creative' accounting practices in firms like Enron, WorldCom, Arthur Anderson and Computer Associates may maintain quoted prices of stock even as the company's net worth gets completely eroded. Thus, the bankruptcy losses would be only a small part of the total losses resulting from the process of financial deterioration.

10. ***International Risk:*** International risk can include both country risk and exchange rate risk.

    (a) *Exchange Rate Risk:* All investors who invest internationally in today's increasingly global investment arena face the prospect of uncertainty in the returns after they convert the foreign gains back to their own currency. Unlike the past, when most US investors ignored international investing alternatives, investors today must recognize and understand exchange rate risk, which can be defined as the variability in returns on securities caused by currency fluctuations. Exchange rate risk is sometimes called currency risk.

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Example: A US investor who buys a German stock denominated in marks (German currency), must ultimately convert the returns from this stock back to dollars. If the exchange rate has moved against the investor, losses from these exchange rate movements can partially or totally negate the original return earned. Obviously, US investors who invest only in US stocks on US markets do not face this risk, but in today's global environment where investors increasingly consider alternatives from other countries, this factor has become important. Currency risk affects international mutual funds, global mutual funds, closed-end single country funds, American Depository Receipts, foreign stocks, and foreign bonds.

(b) *Country Risk:* Country risk, also referred to as political risk, is an important risk for investors today. With more investors investing internationally, both directly and indirectly, the political and therefore economic stability and viability of a country's economy need to be considered. The United States has the lowest country risk, and other countries can be judged on a relative basis using the United States as a benchmark. Examples of countries that needed careful monitoring in the 1990s because of country risk included the former Soviet Union and Yugoslavia, China, Hong Kong, and South Africa.

11. ***Liquidity Risk:*** Liquidity risk is the risk associated with the particular secondary market in which a security trades. An investment that can be bought or sold quickly and without significant price concession is considered liquid. There is more uncertainty about the time element and the price concession, the greater the liquidity risk. A treasury bill has little or no liquidity risk, whereas a small OTC stock may have substantial liquidity risk.

Liquid Assets Risk: It is that portion of an asset's total variability of return which results from price discounts given or sales concessions paid in order to sell the asset without delay. Perfectly liquid assets are highly marketable and suffer no liquidation costs. Illiquid assets are not readily marketable and suffer no liquidation costs. Either price discounts must be given or sales commissions must be paid, or the seller must incur both the costs, in order to find a new investor for an illiquid asset. The more illiquid the asset is, the larger the price discounts or the commissions that must be paid to dispose of the assets.

12. ***Political Risk:*** It arises from the exploitation of a politically weak group for the benefit of a politically strong group, with the efforts of various groups to improve their relative positions increasing the variability of return from the affected assets. Regardless of whether the changes that cause political risk are sought by political or by economic interests, the resulting variability of return is called political risk, if it is accomplished through legislative, judicial or administrative branches of the government.

Domestic political risk arises from changes in environmental regulations, zoning requirements, fees, licenses, and most frequently, taxes. Taxes could be both direct and indirect. Some types of securities and certain categories of investors enjoy a privileged tax status.

International political risk takes the form of expropriation of non-residents' assets, foreign exchange controls that won't let foreign investors withdraw their funds, disadvantageous tax and tariff treatments, requirements that non-residents investors give partial ownership to local residents, and un-reimbursed destruction of foreign-owned assets by hostile residents of the foreign country.

13. ***Industry Risk:*** An industry may be viewed as group of companies that compete with each other to market a homogeneous product. Industry risk is that portion of an investment's total variability of return caused by events that affect the products and firms that make up an industry. For example, commodity prices going up or down will affect all the commodity producers, though not equally.

Notes

The stage of the industry's life cycle, international tariffs and/or quotas on the products produced by an industry, product/industry related taxes (e.g. cigarettes), industry-wide labour union problems, environmental restrictions, raw material availability, and similar factors interact with and affect all the firms in an industry simultaneously. As a result of these common features, the prices of the securities issued by the competing firms tend to rise and fall together.

These risk factors do not make up an exhaustive list, but are merely representative of the major classifications involved. All the uncertainties taken together make up the total risk, or the total variability of return.

Self Assessment

Fill in the blanks:

1. ……. is the risk for the market as a whole.
2. ……risk is sometimes used synonymously with systematic risk.
3. Every investment involves ……. that make future investments returns risk-prone.

4.2 Measurement of Risk

4.2.1 Volatility

Of all the ways to describe risk, the simplest and possibly most accurate is "the uncertainty of a future outcome." The anticipated return for some future period is known as the expected return. The actual return over some past period is known as the realized return. The simple fact that dominates investing is that the realized return on an asset with any risk attached to it may be different from what was expected. Volatility may be described as the range of movement (or price fluctuation) from the expected level of return.



Example: The more a stock goes up and down in price, the more volatile that stock is. Because wide price swings create more uncertainty of an eventual outcome, increased volatility can be equated with increased risk. Being able to measure and determine the past volatility of a security is important in that it provides some insight into the riskiness of that security as an investment.

4.2.2 Standard Deviation

Investors and analysts should be at least somewhat familiar with the study of probability distributions. Since the return an investor will earn from investing is not known, it must be estimated. An investor may expect the TR (Total Return) on a particular security to be 10% for the coming year, but in truth this is only a "point estimate."

4.2.3 Probability Distributions

To deal with the uncertainty of returns, investors need to think explicitly about a security's distribution of probable TRs. In other words, investors need to keep in mind that, although they may expect a security to return 10%, for example, this is only a one-point estimate of the entire range of possibilities. Given that investors must deal with the uncertain future, a number of possible returns can, and will, occur.

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In the case of a treasury bond paying a fixed rate of interest, the interest payment will be made with 100 per cent certainty, barring a financial collapse of the economy. The probability of occurrence is 1.0, because no other outcome is possible. With the possibility of two or more outcomes, which is the norm for common stocks, each possible likely outcome must be considered and a probability of its occurrence assessed. The result of considering these outcomes and their probabilities together is a probability distribution consisting of the specification of the likely returns that may occur and the probabilities associated with these likely returns.

Probabilities represent the likelihood of various outcomes and are typically expressed as a decimal (sometimes fractions are used). The sum of the probabilities of all possible outcomes must be 1.0, because they must completely describe all the (perceived) likely occurrences. How are these probabilities and associated outcomes obtained? In the final analysis, investing for some future period involves uncertainty, and therefore subjective estimates. Although past occurrences (frequencies) may be relied on heavily to estimate the probabilities, the past must be modified for any changes expected in the future. Probability distributions can be either discrete or continuous. With a discrete probability distribution, a probability is assigned to each possible outcome. With a continuous probability distribution, an infinite number of possible outcomes exists. The most familiar continuous distribution is the normal distribution depicted by the well-known bell-shaped curve often used in statistics. It is a two-parameter distribution in that the mean and the variance fully describe it.

To describe the single-most likely outcome from a particular probability distribution, it is necessary to calculate its expected value. The expected value is the average of all possible return outcomes, where each outcome is weighted by its respective probability of occurrence. For investors, this can be described as the expected return.

We have mentioned that it's important for investors to be able to quantify and measure risk. To calculate the total risk associated with the expected return, the variance or standard deviation is used. This is a measure of the spread or dispersion in the probability distribution; that is, a measurement of the dispersion of a random variable around its mean. Without going into further details, just be aware that the larger this dispersion, the larger the variance or standard deviation. Since variance, volatility and risk can, in this context, be used synonymously, remember that the larger the standard deviation, the more uncertain the outcome.

Calculating a standard deviation using probability distributions involves making subjective estimates of the probabilities and the likely returns. However, we cannot avoid such estimates because future returns are uncertain. The prices of securities are based on investors' expectations about the future. The relevant standard deviation in this situation is the ex ante standard deviation and not the ex post based on realized returns.

Although standard deviations based on realized returns are often used as proxies for ex ante standard deviations, investors should be careful to remember that the past cannot always be extrapolated into the future without modifications. Ex post standard deviations may be convenient, but they are subject to errors. One important point about the estimation of standard deviation is the distinction between individual securities and portfolios. Standard deviations for well-diversified portfolios are reasonably steady across time, and therefore historical calculations may be fairly reliable in projecting the future. Moving from well-diversified portfolios to individual securities, however, makes historical calculations much less reliable. Fortunately, the number one rule of portfolio management is to diversify and hold a portfolio of securities, and the standard deviations of well-diversified portfolios may be more stable.

Something very important to remember about standard deviation is that it is a measure of the total risk of an asset or a portfolio, including, therefore, both systematic and unsystematic risk. It captures the total variability in the assets or portfolios return whatever the sources of that variability. In summary, the standard deviation of return measures the total risk of one security

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or the total risk of a portfolio of securities. The historical standard deviation can be calculated for individual securities or portfolios of securities using total returns for some specified period of time. This ex post value is useful in evaluating the total risk for a particular historical period and in estimating the total risk that is expected to prevail over some future period.

The standard deviation, combined with the normal distribution, can provide some useful information about the dispersion or variation in returns. In a normal distribution, the probability that a particular outcome will be above (or below) a specified value can be determined. With one standard deviation on either side of the arithmetic mean of the distribution, 68.3% of the outcomes will be encompassed; that is, there is a 68.3% probability that the actual outcome will be within one (plus or minus) standard deviation of the arithmetic mean. The probabilities are 95% and 99% that the actual outcome will be within two or three standard deviations, respectively, of the arithmetic mean.

4.2.4 Beta

Beta is a measure of the systematic risk of a security that cannot be avoided through diversification. Beta is a relative measure of risk – the risk of an individual stock relative to the market portfolio of all stocks. If the security's returns move more (less) than the market's returns as the latter changes, the security's returns have more (less) volatility (fluctuations in price) than those of the market. It is important to note that beta measures a security's volatility, or fluctuations in price, relative to a benchmark, the market portfolio of all stocks.

Securities with different slopes have different sensitivities to the returns of the market index. If the slope of this relationship for a particular security is a 45-degree angle, the beta is 1.0. This means that for every one per cent change in the market's return, on average this security's returns change 1%. The market portfolio has a beta of 1.0. A security with a beta of 1.5 indicates that, on average, security returns are 1.5 times as volatile as market returns, both up and down. This would be considered an aggressive security because when the overall market return rises or falls 10%, this security, on average, would rise or fall 15%. Stocks having a beta of less than 1.0 would be considered more conservative investments than the overall market.

Beta is useful for comparing the relative systematic risk of different stocks and, in practice, is used by investors to judge a stock's riskiness. Stocks can be ranked by their betas. Because the variance of the market is constant across all securities for a particular period, ranking stocks by beta is the same as ranking them by their absolute systematic risk. Stocks with high betas are said to be high-risk securities.

The risk of an individual security can be estimated under CAPM model. The market related risk, which is also called 'systematic risk,' is unavoidable even by diversification of the portfolio. The systematic risk of an individual security is measured in terms of its sensitivity to market movements which is referred to as security's beta. Investors can avoid or eliminate the unsystematic risk by investing funds in wide range of securities and by having well diversified portfolio. Beta coefficient is a measure of the volatility of stock price in relation to movement in stock index of the market; therefore, beta is the index of systematic risk.

$$\beta_I = \frac{Cov_{im}}{Var_m} = \frac{\sigma_i \sigma_m Cor_{im}}{\sigma_m^2} = \frac{\sigma_i \sigma_m Cor_{im}}{\sigma_m}$$

Where,

β_I = Beta of individual security

Cov_{im} = Covariance of returns of individual security with market portfolio

Var_m = Variance of returns of market portfolio (σ_m^3)

Notes

Cor_{im} = Correlation coefficient between the returns of individual security and the market portfolio

σ_i = Standard deviation of returns of individual security

σ_m = Standard deviation of returns of market portfolio

A beta coefficient is a relative measure of the sensitivity of an assets' return to changes in the return on the market portfolio. Mathematically, the beta coefficient of a security is the security's covariance with the market portfolio divided by the variance of the market portfolio. The beta factor is the measure of volatility of systematic risk of a security or investment in the portfolio. The beta factor of the market as a whole is 1.0. A beta of 1.0 indicates average level of risk while more or less than that the security's return fluctuates more or less than that of market portfolio. A zero beta means no risk. The degree of volatility is expressed as follows:

1. If the beta is one, then it has the same risk profile as the market as a whole, the average risk profile.
2. If the beta is less than one, it is not as sensitive to systematic or market risk as the average investment.
3. If beta is more than one, it is more sensitive to the market or systematic risk than the average investment.

Beta Factor of a Market Portfolio

If the return from the market portfolio rises or falls, we should expect a corresponding rise or fall in the return from an individual share. The amount of this corresponding rise or fall depends on the beta factor of the share. The beta factor of an investor's portfolio is the total of the weighted average beta factors of each security in the portfolio. As the market portfolio represents all shares on the stock market, it follows that the beta coefficient of the market portfolio must be 1, and all other betas are viewed relative to this value. Thus, if the return from the market portfolio rise by says 2%, the coefficient would be:

$$\frac{\text{Increase in return on investment}}{\text{Increase in return on market portfolio}} = \frac{2\%}{2\%} = 1$$

CAPM indicates the expected return of a particular security in view of its systematic or market risk. The value of a share price is determined in relation to investment in shares of individual companies, rather than as a portfolio.

In practice, for estimation of beta factor the following regression equation is used:

$$R_i = \alpha_i + \beta_i R_m + e_i$$

Where,

R_i = Rate of return of individual security

α_i = The intercept that equals the risk free rate (R_f)

β_i = Beta factor of he individual security

R_m = Market of return

e_i = Random error, which reflects the diversifiable risk of individual security

Illustration 1: Wipro provides you the following informations. Calculate the expected rate of return of a portfolio:

Expected market return	15%
Risk-free rate of return	9%

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Standard deviation of an asset	2.4%
Market Standard deviation	2.0%
Correlation coefficient of portfolio with market	0.9

Solution:

Calculation of Market Sensitivity Index (β_i)

Since, market sensitivity index is not given in the problem, it is calculated by applying the following formula:

$$\beta_i = \frac{\sigma_i}{\sigma_m} \times r_{im}$$

Where, β_t = Market sensitivity index or Beta factor

σ_i = Standard deviation of an asset i.e., 0.024

σ_m = Market Standard deviation i.e., 0.02

r_{im} = Correlation coefficient of portfolio with market i.e., 0.90

$$\beta_i = \frac{0.024}{0.02} \times 0.90 = 1.08$$

We can calculate the expected rate of return of a portfolio by applying capital asset pricing model:

$$E(R_i) = R_f + \beta_i (R_m - R_f)$$

Where,

$E(R_i)$ = Expected rate of return of portfolio

R_f = Risk free rate of return i.e., 9%

R_m = Expected return of market portfolio i.e. 15%

β_i = Beta coefficient of investment i.e. 1.08

By substituting, we get

$E(R_i) = 9 + 1.08 (15 - 9) = 9 + 1.08(6) = 15.48$ or 15.48%

Illustration 2: SCM Portfolio Ltd. has three investments in its portfolio. Its details are given below:

Investment	E(R)		Proportion of Invested Funds
Wipro	14%	1.6	50%
SBI	16%	1.2	20%
DCM	12%	0.8	30%

Calculate the weighted average of expected return and Beta factor of the portfolio.

Solution:

Weighted Average of Expected Return of the Total Portfolio:

$E(R_p) = (14\% \times 0.5) + (16\% \times 0.2) + (12\% \times 0.3) = 7\% + 3.2\% + 3.6\% = 13.8\%$

Weighted Average Market Sensitivity Index of the Total Portfolio:

$\beta_p = (1.6 \times 0.5) + (1.2 \times 0.2) + (0.8 \times 0.3) = 0.8 + 0.24 + 0.24 = 1.28$

Notes

Self Assessment

State whether the following statements are true or false:

4. The more a stock goes up and down in price, the more volatile the stock is.
5. The beta factor is the measure of volatility of non-systematic risk of a security.
6. CAPM indicates the expected return of a particular security in view of its systematic/ market risk.

4.3 Risk and Expected Return

Risk and expected return are the two key determinants of an investment decision. Risk, in simple terms, is associated with the variability of the rates of return from an investment; how much do individual outcomes deviate from the expected value? Statistically, risk is measured by any one of the measures of dispersion such as coefficient of range, variance, standard deviation etc.

The risk involved in investment depends on various factors such as:

1. The length of the maturity period - longer maturity periods impart greater risk to investments.
2. The creditworthiness of the issuer of securities - the ability of the borrower to make periodical interest payments and pay back the principal amount will impart safety to the investment and this reduces risk.
3. The nature of the instrument or security also determines the risk. Generally, government securities and fixed deposits with banks tend to be riskless or least risky; corporate debt instruments like debentures tend to be riskier than government bonds and ownership instruments like equity shares tend to be the riskiest. The relative ranking of instruments by risk is once again connected to the safety of the investment.
4. Equity shares are considered to be the most risky investment on account of the variability of the rates of returns and also because the residual risk of bankruptcy has to be borne by the equity-holders.
5. The liquidity of an investment also determines the risk involved in that investment. Liquidity of an asset refers to its quick saleability without a loss or with a minimum of loss.
6. In addition to the aforesaid factors, there are also various others such as the economic, industry and firm specific factors that affect the risk an investment.

Another major factor determining the investment decision is the rate of return expected by the investor. The rate of return expected by the investor consists of the yield and capital appreciation.



Notes Before we look at the methods of computing the rate of return from an investment, it is necessary to understand the concept of the return on investment. We have noted earlier that an investment is a postponed consumption. Postponement of consumption is synonymous with the concept of 'time preference for money'. Other things remaining the same, individuals prefer current consumption to future consumption. Therefore, in order to induce individuals to postpone current consumption they have to be paid certain compensation, which is the time preference for consumption. The compensation paid should be a positive real rate of return. The real rate of return is generally equal to the rate

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of return expected by an investor from a risk-free capital asset assuming a world without inflation. However, in real life, inflation is a common feature of a capitalist economy. If the investor is not compensated for the effects of inflation, the real rate of return may turn out to be either zero or negative. Therefore, the investors, generally, add expected inflation rate to the real rate of return to arrive at the nominal rate of return.

For example, assume that the present value of an investment is ₹ 100; the investor expects a real time rate of 3% per annum and the expected inflation rate is 3% per annum. If the investor was to receive only the real time rate, he would get back ₹ 103 at the end of one year. The real rate of return received by the investor would be equal to zero because the time preference rate of 3% per annum is matched by the inflation of 3% per annum. If the actual inflation rate is greater than 3% per annum, the investor would suffer negative returns.

Thus, nominal rate of return on a risk-free asset is equal to the time preference real rate plus expected inflation rate.

If the investment is in capital assets other than government obligations, such assets would be associated with a degree of risk that is idiosyncratic to the investment. For an individual to invest in such assets, an additional compensation, called the risk premium will have to be paid over and above the nominal rate of return.

4.4 Determinants of the Rate of Return



Caution Therefore, three major determinants of the rate of return expected by the investor are:

1. The time preference risk-free real rate
2. The expected rate of inflation
3. The risk associated with the investment, which is unique to the investment.

Hence,

Required return = Risk-free real rate + Inflation premium + Risk premium

It was stated earlier that the rate of return from an investment consists of the yield and capital appreciation, if any. The difference between the sale price and the purchase price is the capital appreciation and the interest or dividend divided by the purchase price is the yield. Accordingly

$$\text{Rate of return } (R_t) = \frac{I_t + [P_t - P_{t-1}]}{P_{t-1}} \quad ...(1)$$

Where R_t = Rate of return per time period 't'

I_t = Income for the period 't'

P_t = Price at the end of time period 't'

P_{t-1} = Initial price, i.e., price at the beginning of the period 't'.

In the above equation 't' can be a day or a week or a month or a year or years and accordingly daily, weekly, monthly or annual rates of return could be computed for most capital assets.

The above equation can be split in to two components. viz.,

$$\text{Rate of return } (R_t) = \frac{I_t}{P_{t-1}} + \frac{P_t - P_{t-1}}{P_{t-1}} \quad ...(2)$$

Notes

Where $\frac{I_t}{P_{t-1}}$ is called the current yield, and $\frac{P_t - P_{t-1}}{P_{t-1}}$ is called the capital gain yield.

Or

RoR = Current yield + Capital gain yield

Illustration 3: The following information is given for a corporate bond. Price of the bond at the beginning of the year: ₹ 90, Price of the bond at the end of the year: ₹ 95.40, Interest received for the year: ₹ 13.50. Compute the rate of return.

Solution:

The rate of return can be computed as follows:

$$\frac{13.50 + (95.40 - 90)}{90} = 0.21 \text{ or } 21\% \text{ per annum}$$

The return of 21% consists of 15% current yield and 6% capital gain yield.

There is always a direct association between the rates of return and the asset prices. Finance theory stipulates that the price of any asset is equal to the sum of the discounted cash flows, which the capital asset owner would receive. Accordingly, the current price of any capital asset can be expected, symbolically, as

$$P_0 = \sum_{t=1}^{n} \frac{E(I_t)}{(1+r)^t} + \frac{P_n}{(1+r)^n} \quad ...(3)$$

Where $E(I_t)$ = Expected income to be received in year 't'

P_0 = Current price of the capital asset

P_n = Price of the asset on redemption or on liquidation

r = The rate of return investors expect given the risk inherent in that capital asset.

Thus, 'r' is the rate or return, which the investors require in order to invest in a capital asset that is used to discount the expected future cash flows from that capital asset.

Illustration 4: Mr. American has purchased 100 shares of ₹ 10 each of Kinetic Ltd. in 2005 at ₹ 78 per share. The company has declared a dividend @ 40% for the year 2006-07. The market price of share as on 1-4-2006 was ₹ 104 and on 31-3-2007 was ₹ 128. Calculate the annual return on the investment for the year 2006-07.

Dividend received for 2004-05 = ₹ 10 × 40/100 = ₹ 4

Solution:

Calculation of annual rate of return on investment for the year 2006-07

$$R = \frac{d_1 + (P_1 - P_0)}{P_0} = \frac{4 + (128 - 104)}{104} = 0.2692 \text{ or } 26.92\%$$

4.5 Risk-return Relationship

The most fundamental tenet of finance literature is that there is a trade-off between risk and return. The risk-return relationship requires that the return on a security should be commensurate with its riskiness. If the capital markets are operationally efficient, then all investment assets should provide a rate or return that is consistent with the risks associated with them. The risk and return are directly variable, i.e., an investment with higher risk should produce higher return.

The risk/return trade-off could easily be called the "ability-to-sleep-at-night test." While some people can handle the equivalent of financial skydiving without batting an eye, others are

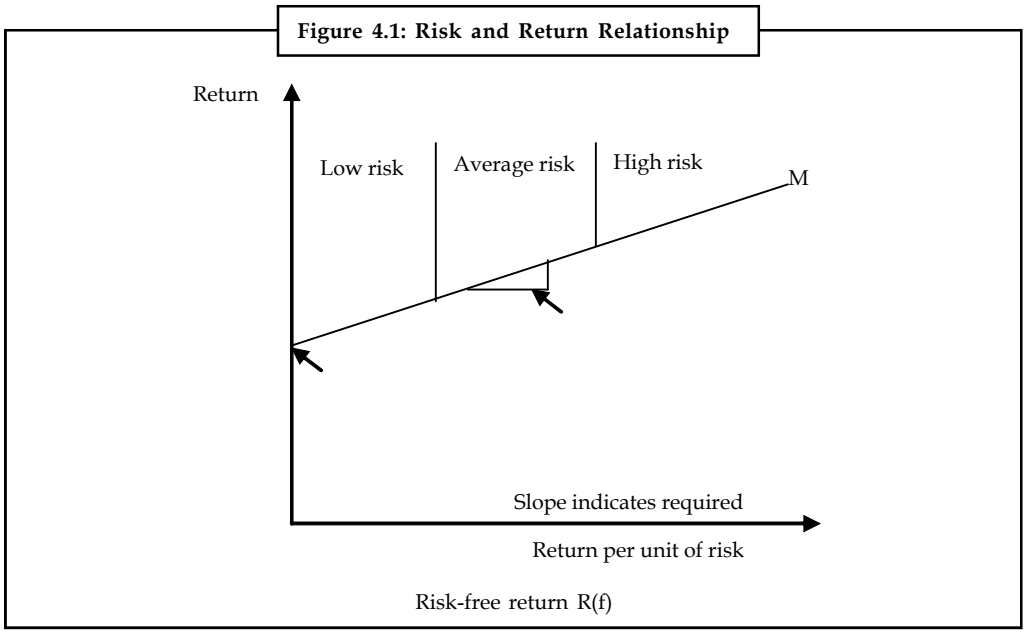
Notes

terrified to climb the financial ladder without a secure harness. Deciding what amount of risk you can take while remaining comfortable with your investments is very important.

In the investing world, the dictionary definition of risk is the possibility that an investment's actual return will be different than expected. Technically, this is measured in statistics by standard deviation. Risk means you have the possibility of losing some, or even all, of your original investment.

Low levels of uncertainty (low risk) are associated with low potential returns. High levels of uncertainty (high risk) are associated with high potential returns. The risk/return trade-off is the balance between the desire for the lowest possible risk and the highest possible return. This is demonstrated graphically in the chart below. A higher standard deviation means a higher risk and higher possible return. The figure below represents the relationship between risk and return.

Figure 4.1: Risk and Return Relationship



The slope of the Market Line indicates the return per unit of risk required by all investors. Highly risk-averse investors would have a steeper line, and vice versa. Yields on apparently similar stocks may differ. Differences in price, and therefore yield, reflect the market's assessment of the issuing company's standing and of the risk elements in the particular stocks. A high yield in relation to the market in general shows an above average risk element. This is shown in the Figure 4.2.

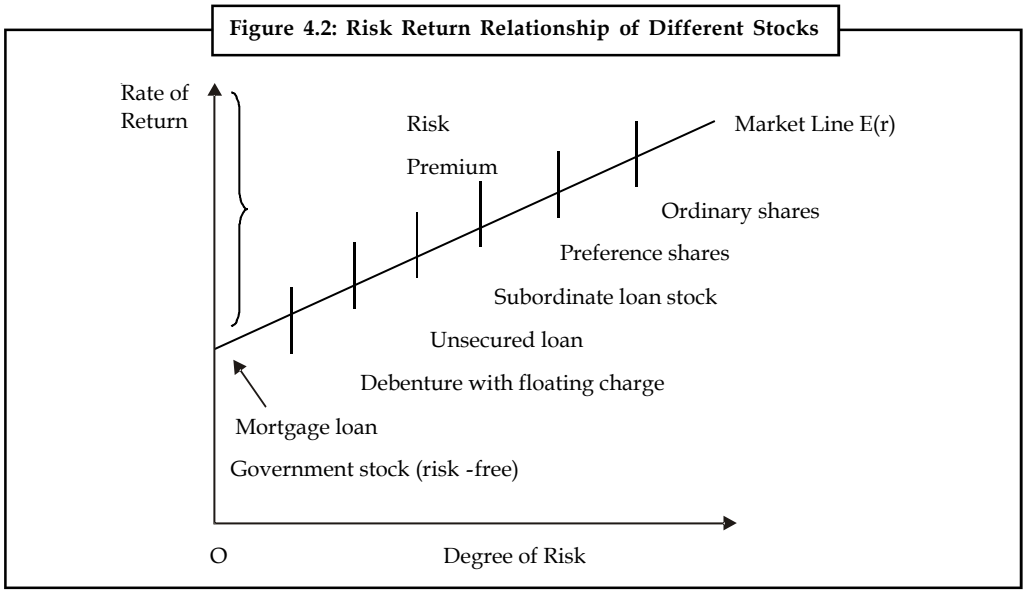
Given the composite market line prevailing at a point of time, investors would select investments that are consistent with their risk preferences. Some will consider low-risk investments, while others prefer high-risk investments.

A common misconception is that higher risk equals greater return. The risk/return trade-off tells us that the higher risk gives us the possibility of higher returns. But there are no guarantees. Just as risk means higher potential returns, it also means higher potential losses.

On the lower end of the scale, the risk-free rate of return is represented by the return on Treasury Bills of government securities, because their chance of default is next to nil. If the risk-free rate is currently 8 to 10%, this means, with virtually no risk, we can earn 8 to 10% per year on our money.

Notes

Figure 4.2: Risk Return Relationship of Different Stocks



The common question arises: who wants to earn 6% when index funds average 12% per year over the long run? The answer to this is that even the entire market (represented by the index fund) carries risk. The return on index funds is not 12% every year, but rather 5% one year, 25% the next year, and so on. An investor still faces substantially greater risk and volatility to receive an overall return that is higher than a predictable government security. We call this additional return the risk premium, which in this case is 8% (12% - 8%).

Determining what risk level is most appropriate for you isn't an easy question to answer. Risk tolerance differs from person to person. Your decision will depend on your goals, income and personal situation, among other factors.

Self Assessment

Fill in the blanks:

7. Risk and …….. are two key determinants of an investment decision.
8. Risk is measured by any one of the measures of …… .
9. Rate of return expected by the investor consists of yield and …….. .

4.6 Portfolio and Security Returns

A portfolio is a collection of securities. Since it is rarely desirable to invest the entire funds of an individual or an institution in a single security, it is essential that every security be viewed in a portfolio context. Thus, it seems logical that the expected return of a portfolio should depend on the expected return of each of the security contained in the portfolio. It also seems logical that the amounts invested in each security should be important. Indeed, this is the case. The example of a portfolio with three securities shown in following table illustrates this point.

The expected holding period value-relative for the portfolio is clearly shown:

= 1.155

Giving an expected holding period return of 15.50%.

Notes

1. *Security and Portfolio Value*

Security	No. of Shares (₹)	Current Price Per Share (₹)	Current Value (₹)	Expected End-of-Period Per Share Value (₹)	Expected End-of-Period Share Value (₹)
1	**2**	**3**	**4**	**5**	**6**
XYZ	100	15.00	1,500	18.00	1,800
ABC	150	20.00	3,000	22.00	3,300
RST	200	40.00	8,000	45.00	9,000
KNF	250	25.00	6,250	30.00	7,500
DET	100	12.50	1,250	15.00	1,500
			20,000		**23,100**

2. *Security and Portfolio Value-Relative*

Security	Current Value (₹)	Proportion of Current Value of Properties	Current Price Per Share (₹)	Expected End-of-Period Value Per Share (₹)	Expected Holding-Period Value-Relative	Contribution to Portfolio Expected Holding-Period Value-Relative
(1)	**(2)**	**3 = (2) ₹ 20,000**	**(4)**	**(5)**	**(6) = (5) / (4)**	**(7) = (3) × (6)**
XYZ	1,500	.0750	15,00	18.00	. 1,200	0.090000
ABC	3,000	.1500	20,00	22.00	1,100	0.165000
RST	8,000	.4000	40,00	45.00	1,125	0.450000
KNF	6,250	.3125	25,00	30.00	1,200	0.375000
DET	1,250	.0625	12,50	15.00	1,200	0.075000
	20,000	**1.0000**				**1.155000**

3. *Security and Portfolio Holding-Period Returns*

Security	Proportion of Current Value of Portfolio	Expected Holding Period Return (%)	Contribution to Portfolio Expected Holding Period Return (%)
1	**2**	**3**	**4**
XYZ	.0750	20.00	1.50
ABC	.1500	10.00	1.50
RST	.4000	12.50	5.00
KNF	.3125	20.00	6.25
DET	.0625	20.00	1.25
	1.0000		**15.50**

Since the portfolio's expected return is a weighted average of the expected returns of its securities, the contribution of each security to the portfolio's expected returns depends on its expected returns and its proportionate share of the initial portfolio's market value. Nothing else is relevant. It follows that an investor who simply wants the greatest possible expected return should hold one security. This should be the one that is considered to have the greatest expected return.

Notes

Very few investors do this, and very few investment advisers would counsel such an extreme policy. Instead, investors should diversify, meaning that their portfolio should include more than one security. This is because diversification can reduce risk.

Illustration 5: The average market prices and dividend per share of Asian CERC Ltd. for the past 6 years are given below:

Year	Average market price (₹)	Dividend per share (₹)
2007	68	3.0
2006	61	2.6
2005	50	2.0
2004	53	2.5
2003	45	2.0
2002	38	1.8

Solution: Calculate the average rate of return of Asian CERC Ltd.'s shares for past 6 years.

Year	Average market price per share (₹)	Capital gain (%)	Dividend per share (₹)	Dividend yield (%)	Rate of return (%)
2002	38	-	1.8	4.74	-
2003	45	18.42	2.0	4.44	22.86
2004	53	17.78	2.5	4.72	22.50
2005	50	-5.66	2.0	4.00	-1.66
2006	61	22.00	2.6	4.26	26.26
2007	68	11.48	3.0	4.41	15.89

$$R = 1/5\ (22.86 + 22.50 - 1.66 + 26.26 + 15.89)$$

$$= 1/5(85.85) = 17.17\%$$

Risk

All possible questions which the investor may ask, the most important one is concerned with the probability of actual yield being less than zero, that is, with the probability of loss. This is the essence of risk. A useful measure of risk should somehow take into account both the probability of various possible "bad" outcomes and their associated magnitudes. Instead of measuring the probability of a number of different possible outcomes, the measure of risk should somehow estimate the extent to which the actual outcome is likely to diverge from the expected.

Two measures are used for this purpose: the average (or mean) absolute deviation and the standard deviation.

Illustration 6: The rate of return of equity shares of Wipro Ltd., for past six years are given below:

Year	01	02	03	04	05	06
Rate of return (%)	12	18	–6	20	22	24

Calculate the average rate of return, standard deviation and variance.

Solution:

Calculation of Average Rate of Return ($\bar{R}$)

Notes

$$\bar{R} = \frac{\Sigma R}{N} = \frac{12 + 18 - 6 + 20 + 22 + 24}{6} = 15\%$$

$$\sigma^2 = \frac{\Sigma(R - \bar{R})^2}{N}$$

Year	Rate of Return (%)	$(R - \bar{R})$	$(R - \bar{R})^2$
2001	12	–3	9
2002	18	3	9
2003	–6	–21	441
2004	20	5	25
2005	22	7	43
2006	24	9	81
			$\Sigma(R - \bar{R})^2 = 614$

$$\text{Variance } (\sigma^2) = \frac{614}{6} = 102.33$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{102.33}$$

$$= 10.12\%$$

Illustration 7: Mr. RKV invested in equity shares of Wipro Ltd., its anticipated returns and associated probabilities are given below:

Return (%)	–15	–10	5	10	15	20	30
Probability	0.05	0.10	0.15	0.25	0.30	0.10	0.05

You are required to calculate the expected rate of return and risk in terms of standard deviation.

Solution:

Calculation of expected return and risk in terms of standard deviation.

Return (R)	Probability (P)	(P × R)	$(R - \bar{R})$	$(R - \bar{R})^2$	$(R - \bar{R})^2 \times P$
–15	0.05	–0.75	–5.5	30.25	1.5125
–10	0.10	–1.0	–0.5	0.25	0.0250
5	0.15	0.75	–4.5	20.25	3.0375
10	0.25	2.50	0.5	0.25	0.625
15	0.30	4.50	5.5	30.25	9.0750
20	0.10	2.00	10.5	110.25	11.0250
30	0.05	1.50	20.5	420.25	21.0125
	1.00	**$\bar{R} = 9.5\%$**			**$\Sigma(R - \bar{R})^2 P = 45.75$**

$$\text{Expected Return } \bar{R} = \Sigma(P \times R) = 9.5\%$$

$$\text{Standard Deviation} = \Sigma(R - \bar{R})^2 P = \sqrt{45.75} = 6.764$$

The risk in the above illustration can be measured by taking the range of 45% [i.e. 30% – (–) 15%] and standard deviation of 6.764. The investment carries greater risk in terms of high variation in return.

Notes

Illustration 8: Mr. Marin provides the following informations, from the same compute his expected return and standard deviation and variance.

Events	1	2	3	4
Probability	.20	.40	.30	.10
Return (%)	–10	25	20	10

Solution:

1. *Calculating the Mean Absolute Deviation:*

Event	Probability	Return (%)	P × Return	Deviation	Probability × Deviation	Probability × Absolute Deviation
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A	.20	-10	-2.0	-25.0	-5.0	5.0
B	.40	25	10.0	10.0	4.0	4.0
C	.30	20	6.0	.0	1.5	1.5
D	.10	10	-1.0	-5.0	-0.5	0.5
			Expected Return = 5.0		**0**	**Average = 10.0 Absolute Deviation**

2. *Calculating the Standard Deviation:*

Event	Probability	Deviation	Deviation squared	Probability × Deviation
(1)	(2)	(3)	(4) = (3)^2	(5) = (2) x (4)
A	.20	-25.0	625.0	125.0
B	.40	10.0	100.0	40.0
C	.30	5.0	25.0	7.5
D	.10	-5.0	25.0	2.4
		Variation = Weighted average squared deviation = 175.0 Standard Deviation = square root of variance = 13.2287		

When an analyst predicts that a security will return 15% next year, he or she is presumably stating something comparable to an expected value. If asked to express the uncertainty about the outcome, he or she might reply that the odds are 2 out of 3 that the actual return will be within 10% of the estimate (i.e., 5% and 25%). The standard deviation is a formal measure of uncertainty, or risk, expressed in this manner, just as the expected value is a formal measure of a "best guess" estimate. Most analysts make such predictions directly, without explicitly assessing probabilities and making the requisite computations.

Illustration 9: The possible returns and associated probabilities of Securities X and Y are given below:

Security X		Security Y	
Probability	Return (%)	Probability	Return (%)
0.05	6	0.10	5
0.15	10	0.20	8
0.40	15	0.30	12
0.25	18	0.25	15
0.10	20	0.10	18
0.05	24	0.05	20

Calculate the expected return and standard deviation of securities X and Y.

Solution:

Calculation of expected return and standard deviation of Security X:

Notes

Probability (P)	Return (%) (R)	(P × R)	$(R - \bar{R})$	$(R - \bar{R})^2 P$
0.05	6	0.30	- 9.5	4.5125
0.15	10	1.50	-5.5	4.5375
0.40	15	6.00	-0.5	0.1000
0.25	18	4.50	2.5	1.5625
0.10	20	2.00	4.5	2.0250
0.05	24	1.20	8.5	3.6125
1.00		**$\bar{R}$ = 15.5**	**$\Sigma(R - \bar{R})^2 P$ = 16.35**	

Expected Return of Security X = 15.5%

Standard Deviation of Security X

$$\sigma_y^2 = 16.35$$

$$\sigma_y = \sqrt{16.35} = 4.04\%$$

Calculation of expected return and standard deviation of Security Y

Probability (P)	Return (%) (R)	(P × R)	$(R - \bar{R})$	$(R - \bar{R})^2 P$
0.10	5	0.50	-7.25	5.2563
0.20	8	1.60	-4.25	3.6125
0.30	12	3.60	-0.25	0.0188
0.25	15	3.75	2.75	1.8906
0.10	18	1.80	5.75	3.3063
0.05	20	1.00	7.75	3.0031
		12.25	**$\Sigma(R - \bar{R})^2 P$ = 17.0876**	

Expected Return Security Y $(\bar{R})$ = 12.25%

Standard Deviation of Security Y

$$\sigma_y^2 = 17.086$$

$$\sigma_y = \sqrt{17.0876} = 4.134\%$$

Analysis – Security X has higher expected return and lower level of risk as compared to Security Y.

4.7 Return and Risk of Portfolio

4.7.1 Return of Portfolio (Two Assets)

The expected return from a portfolio of two or more securities is equal to the weighted average of the expected returns from the individual securities.

$$\Sigma(R_P) = W_A(R_A) + W_B(R_B)$$

Where,

$\Sigma(R_P)$ = Expected return from a portfolio of two securities

W_A = Proportion of funds invested in Security A

Notes

W_B = Proportion of funds invested in Security B

R_A = Expected return of Security A

R_B = Expected return of Security B

$W_A + W_B = 1$

Illustration 10: A Ltd.'s share gives a return of 20% and B Ltd.'s share gives 32% return. Mr. Gotha invested 25% in A Ltd.'s shares and 75% of B Ltd.'s shares. What would be the expected return of the portfolio?

Solution:

Portfolio Return = 0.25(20) + 0.75 (32) = 29%

Illustration 11: Mr. RKV's portfolio consists of six securities. The individual returns of each of the security in the portfolio are given below:

Security	Proportion of investment in the portfolio	Return
Wipro	10%	18%
Latham	25%	12%
SBI	8%	22%
ITC	30%	15%
RNL	12%	6%
DLF	15%	8%

Calculate the weighted average of return of the securities consisting the portfolio.

Solution:

Security	Weight (W)	Return (%) (R)	(W × R)
Wipro	0.10	18	1.80
Latham	0.25	12	3.00
SBI	0.08	22	1.76
ITC	0.30	15	4.50
RNL	0.12	6	0.72
DLF	0.15	8	1.20
			12.98

∴ Portfolio return is 12.98%.

4.7.2 Risk of Portfolio (Two Assets)

The risk of a security is measured in terms of variance or standard deviation of its returns. The portfolio risk is not simply a measure of its weighted average risk. The securities that a portfolio contains are associated with each other. The portfolio risk also considers the covariance between the returns of the investment. Covariance of two securities is a measure of their co-movement; it expresses the degree to which the securities vary together. The standard deviation of a two-share portfolio is calculated by applying formula given below:

$$\sigma_p = W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2W_A W_B \rho_{AB}\sigma_A\sigma_B$$

Where,

σ_p = Standard deviation of portfolio consisting securities A and B

$W_A W_B$ = Proportion of funds invested in Security A and Security B

Notes

$\sigma_A\sigma_B$ = Standard deviation of returns of Security A and Security B

ρ_{AB} = Correlation coefficient between returns of Security A and Security B

The correlation coefficient (AB) can be calculated as follows:

$$AB = \frac{Cov_{AB}}{\sigma_A \sigma_B}$$

The covariance of Security A and Security B can be presented as follows:

$$Cov_{AB} = \sigma_A \sigma_B \rho_{AB}$$

The diversification of unsystematic risk, using a two-security portfolio, depends upon the correlation that exists between the returns of those two securities. The quantification of correlation is done through calculation of correlation coefficient of two securities (ρ_{AB}). The value of correlation ranges between –1 to 1; it can be interpreted as follows:

If ρ_{AB} = 1, No unsystematic risk can be diversified.

If ρ_{AB} = –1, All unsystematic risks can be diversified.

If ρ_{AB} = 0, No correlation exists between the returns of Security A and Security B.

Illustration 12: The returns of Security of Wipro and Security of Infosys for the past six years are given below:

Year	Security of Wipro Return (%)	Security of Infosys Return (%)
2003	9	10
2004	5	–6
2005	3	12
2006	12	9
2007	16	15

Calculate the risk and return of portfolio consisting.

Solution:

Calculation of Mean Return and Standard Deviation of Security A:

Year	Return (%)	$(R - \bar{R})$	$(R - \bar{R})^2$
2003	9	0	0
2004	5	–4	16
2005	3	–6	36
2006	12	3	9
2007	16	7	49
	45		**110**

Mean Return $(\bar{R})$ = 45/5 = 9%

Standard Deviation (σ_A) = $\sqrt{110}$ = 10.49%

Calculation of Mean Return and Standard Deviation of Security B

Notes

Year	Return (%)	$(R - \bar{R})$	$(R - \bar{R})^2$
2003	10	2	4
2004	–6	14	196
2005	12	4	16
2006	9	1	1
2007	15	7	49
	40		**266**

Mean Return $\left(\bar{R}\right)$ = 40/5 = 8%

Standard Deviation (σ_B) = = 16.31%

Analysis – Security A has a higher historic level of return and lower risk as compared to Security B.
Correlation Coefficient (ρ_{AB}).

$$= \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}\sqrt{N\Sigma Y^2 - \Sigma Y^2}}$$

A's return (%)		B's return (%)		
X	**X^2**	**Y**	**Y^2**	**XY**
9	81	10	100	90
5	25	–6	36	–30
3	9	12	144	36
12	144	9	81	108
16	256	15	225	240
ΣX= 45	**ΣX^2 = 515**	**ΣY = 40**	**ΣY^2 = 586**	**ΣXY = 444**

$$= \frac{(5\times 5) - (45)^2\sqrt{5\times 586 - (40)^2}}{\sqrt{(5\times 515) - (45)^2}\sqrt{5\times 586 - (40)^2}}$$

$$= \frac{2,220 - 1800}{\sqrt{2575 - 2025}\sqrt{2930 - 1600}} = \frac{420}{\sqrt{550}\sqrt{1330}}$$

$$= \frac{420}{23.452\times 36.469} = \frac{420}{855.271} = 0.491$$

Verification:

Calculation of Covariance of Returns of Securities A and B

Year	Returns (%)		$(R_A - \bar{R}_A)$	$(R_B - \bar{R}_B)$	$(R_A - \bar{R}_A) \times (R_B - \bar{R}_B)$
	A	B			
2003	9	10	0	2	0
2004	5	–6	–4	–14	56
2005	3	12	–6	4	–24
2006	12	9	3	1	3
2007	16	15	7	7	49
					Cov_{AB} = 84

$$\rho_{AB} = \frac{Cov_{AB}}{\sigma_A\sigma_B} = \frac{84}{10.49\times 16.31} = 0.491$$

$$Cov_{AB} = \sigma_A\,\sigma_B\,\rho_{AB} = 10.49\times 16.31\times 0.491 = 84$$

Notes

Return of portfolio (R_p)

$= (0.80 \times 9) + (0.20 \times 8) = 7.2 + 1.6 = 8.8\%$

Risk of portfolio (σ_p)

$$\sigma_p^2 = (0.80^2 \times 10.49^2) + (0.20^2 \times 16.31^2) + (2 \times 0.80 \times 0.20 \times 10.49 \times 16.31 \times 0.491)$$

$$= (0.64 \times 110.04) + (0.04 \times 266.02) + 26.88$$

$$= 70.43 + 10.64 + 26.88 = 107.95$$

$$\sigma_p = \sqrt{107.95} = 10.39\%$$

4.7.3 Risk and Return of Portfolio (Three Assets)

Formula for calculating risk of portfolio consisting three securities

$$\sigma_p^2 = W_x^2\sigma_x^2 + W_y^2\sigma_y^2 + W_z^2\sigma_z^2 + 2W_xW_y\rho_{yz}\sigma_y\sigma_z + W_xW_z\rho_{xz}\sigma_x\sigma_z$$

Where,

W_1, W_2, W_3 = Proportion of amount invested in securities X, Y and Z

$\sigma_x, \sigma_y, \sigma_z$ = Standard deviations of securities X, Y and Z

ρ_{xy} = Correlation coefficient between securities X and Y

ρ_{yz} = Correlation coefficient between securities Y and Z

ρ_{xz} = Correlation coefficient between securities X and Z

Illustration 13: A portfolio consists of three securities P, Q and R with the following parameters:

	Security			Correlation coefficient
	P	**Q**	**R**	
Expected return (%)	35	22	20	
Standard deviation (%)	20	26	24	
Correlation coefficient:				
PQ				–0.5
QR				+0.4
PR				+0.6

If the securities are equally weighted, how much is the risk and return of the portfolio of these three securities?

Solution:

Expected Portfolio Return

$= (25 \times 1/3) + (22 \times 1/3) + (20 \times 1/3) = 22.33\%$

$$\sigma_p^2 = (30)^2(1/3)^2 + (26)^2 + (24)^2(1/3)^2 + 2(1/3)(-0.5)(30)(26) + 2(1/3)(1/3)(0.4)(26)(24) + 2(1/3)(1/3)(0.6)(30)(24)$$

$$\sigma_p^2 = 100 + 75.11 + 64 - 86.67 + 55.47 + 96 = 303.91$$

$$\sigma_P = \sqrt{303.91} = 17.43\%$$

Notes



Notes

Optimal Portfolio (Two Assets)

The investor can minimise his risk on the portfolio. Risk avoidance and risk minimisation are the important objectives of portfolio management. A portfolio contains different securities; by combining their weighted returns we can obtain the expected return of the portfolio. A risk-averse investor always prefers to minimise the portfolio risk by selecting the optimal portfolio. The minimum risk portfolio with two assets can be ascertained as follows:

$$W_A = \frac{\partial_B^2 - Cov_{AB}}{\partial_A^2 + \partial_B^2 - Cov_{AB}}$$

In continuation to illustration 9 we can calculate the proportion to be invested (W_A) in Security A.

$$= \frac{16.31^2 - 84}{(10.49^2 + 16.31^2) - (2 \times 84)} = \frac{182.02}{208.06} = 0.875$$

Therefore, 87.5% of funds should be invested in Security A and 12.5% should be invested in Security B, which represents the optimal portfolio.

Self Assessment

State whether the following statements are true or false:

10. The risk of a security is measured in terms of variance or standard deviation of its return.

11. Risk minimization is the only objective of portfolio management.

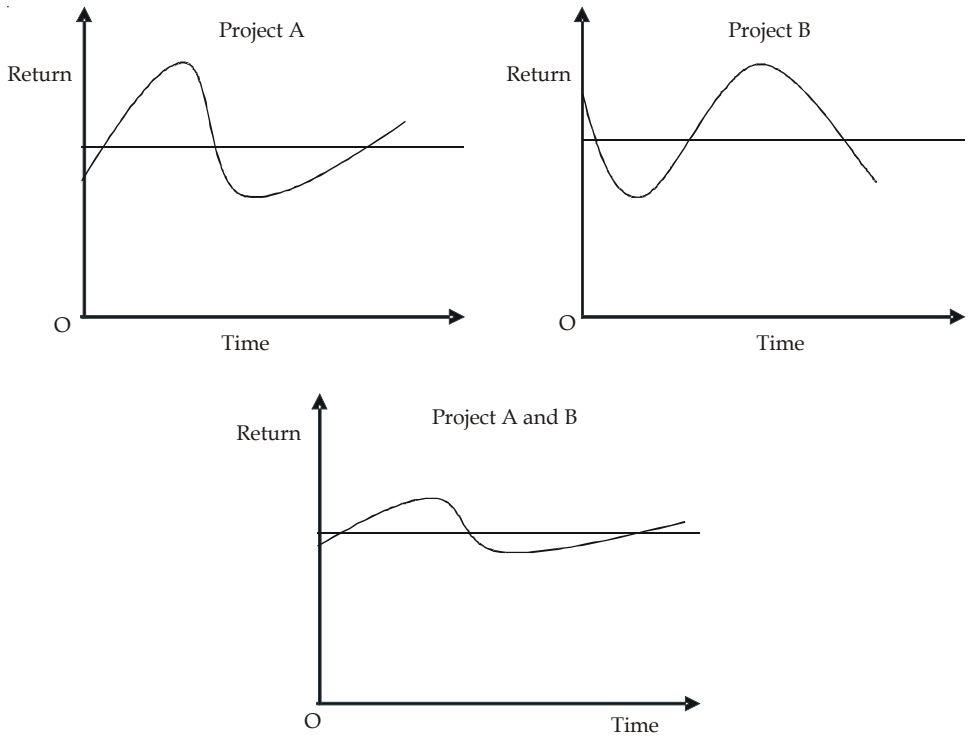
4.8 Portfolio Diversification and Risk

In an efficient capital market, the important principle to consider is that, investors should not hold all their eggs in one basket; investor should hold a well-diversified portfolio. In order to understand portfolio diversification, one must understand correlation. Correlation is a statistical measure that indicates the relationship, if any, between series of numbers representing anything from cash flows to test data. If the two series move together, they are positively correlated; if the series move in opposite directions, they are negatively correlated. The existence of perfectly correlated especially negatively correlated-projects is quite rare. In order to diversify project risk and thereby reduce the firm's overall risk, the projects that are best combined or added to the existing portfolio of projects are those that have a negative (or low positive) correlation with existing projects. By combining negatively correlated projects, the overall variability of returns or risk can be reduced. The Figure 4.3 illustrates the result of diversifying to reduce risk.

It shows that a portfolio is containing the negatively corrected projects A and B, both having the same expected return, E, but less risk (i.e. less variability of return) than either of the projects taken separately. This type of risk is sometimes described as diversifiable or alpha risk. The creation of a portfolio by combining two perfectly correlated projects cannot reduce the portfolio's overall risk below the risk of the least risky project, while the creation of a portfolio combining two projects that are perfectly negatively correlated can reduce the portfolio's total risk to a level below that of either of the component projects, which in certain situations may be zero.

Notes

Figure 4.3: Reduction of Risk through Diversification



Did u know? **Benefits of Diversification**

The gains in risk reduction from portfolio diversification depend inversely upon the extent to which the returns on securities in a portfolio are positively correlated. Ideally, the securities should display negative correlation. This implies that if a pair of securities has a negative correlation of returns, then in circumstances where one of the securities is performing badly, the other is likely to be doing well and vice versa in reverse circumstances. Therefore the average return on holding the two securities is likely to be much 'safer' than investing in one of them alone.

Caselet

Using Index Options is Solution to Hedge Risk in Portfolio

Many times it is in an investor's best interest to lock in recent gains or to protect a portfolio of stocks from a decline beyond a certain price. One way to do this would be to purchase a put option contract on each of your various holdings. However, if the portfolio consists of diversified stocks, then it is probably not cost-effective to insure each and every position in this manner.

As an alternative, 'using index options' is a solution to hedge the risk in the portfolio. Depending on the stocks the choice of index could be Bank Nifty, Midcap or even the benchmark Nifty. Next in order to decide the number of contracts of a particular index required to hedge, calculating beta (β) of the portfolio is the key. This may sound like an

Contd...

Notes

obscure technical term, but beta simply measures the amount of variance in a portfolio in relation to the market. If using the S&P CNX Nifty as a proxy for the market, then β would indicate how much the portfolio moves when the Nifty changes by 1%. For example, if the portfolio changes by 2% whenever the Nifty moves up 1%, then the portfolio has a β of 2.0. If the portfolio changes by 0.5%, then β = 0.5.

Source: financialexpress.com



Case Study

To Invest or Not?

Wipro Company has asked the investors to invest in their securities and while making an offer, they have provided you with the following information. For a period of 10 years, company has provided you with the rate of return on security & return on the market portfolio of its securities as:

Period	Return on security WIPRO (%)	Return on market portfolio (%)
1	20	22
2	22	20
3	25	18
4	21	16
5	18	20
6	-5	8
7	17	-6
8	19	5
9	-7	6
10	20	11

You as an investor have decided to invest in the securities of the company. The anticipated return with the associated probabilities is as:

Return %	–10	–15	5	12	10	20	13
Probability	0.03	0.02	0.15	0.25	0.3	0.1	0.05

Question

Now after getting all the details, what would you suggest, whether to invest in the securities or not and what would be your expected rate of return and risk in terms of standard deviation. Also give your comments based on the average rate of return, variance and beta value for the company's securities.

4.9 Summary

- Corporations operate in a highly dynamic and competitive environment, and many operate both nationally and internationally. As a result, the judgment factor still dominates investment decisions.
- Risk can be defined as the probability that the expected return from the security will not materialize.

Notes

- Every investment involves uncertainties that make future investment returns risk-prone.
- Uncertainties could be due to the political, economic and industry factors.
- Systematic risk is for the market as a whole, while unsystematic risk is specific to an industry or the company individually.
- Beta is a measure of the systematic risk of a security that cannot be avoided through diversification.
- Beta is a relative measure of risk - the risk of an individual stock relative to the market portfolio of all stocks.
- If the security's returns move more (less) than the market's returns as the latter changes, the security's returns have more (less) volatility (fluctuations in price) than those of the market.
- It is important to note that beta measures a security's volatility, or fluctuations in price, relative to a benchmark, the market portfolio of all stocks.
- The risk/return trade-off could easily be called the "ability-to-sleep-at-night test."
- The investor can minimise his risk on the portfolio.
- Risk avoidance and risk minimisation are the important objectives of portfolio management.
- A portfolio contains different securities; by combining their weighted returns we can obtain the expected return of the portfolio.

4.10 Keywords

Beta Coefficient: It is a relative measure of the sensitivity of an assets return to changes in the return on the market portfolio.

Beta: It is a measure of the systematic risk of a security that cannot be avoided through diversification.

Correlation: It is a statistical measure that indicates the relationship between series of number representing anything from cash flows to test data.

Covariance: It is the measure of their co-movement, expressing the degree to which the securities vary together.

Non-systematic Risk: The variability in a security is total returns not related to overall market variability.

Portfolio: It is a collection of securities.

Risk: Probability that the expected return from the security will not materialize.

Systematic Risk: Variability in a security is total returns that are directly associated with overall movements in the general market or economy is called systematic risk.

4.11 Review Questions

1. SCM provides the following data, compute beta of Security J:

   $\sigma_j = 12\%, \sigma_m = 9\%$

   $Cor_{jm} = + 0.72$

Notes

2. Analyse the effect of Beta in the investment decision-making process.
3. Elucidate the methodology for the measurement of historical return and risk.
4. "It is risky for an investor to hold all their eggs in one basket." Why?
5. RKS Ltd. has an expected return of 22% and standard deviation of 40%. BBS Ltd. has an expected return of 24% and standard deviation of 38%. RKS Ltd. has a beta of 0.86 and BBS Ltd. a beta of 1.24. The correlation coefficient between the return of RKS Ltd. and BBS Ltd. is 0.72. The standard deviation of the market return is 20%. Suggest:
   (a) Is investing in BBS Ltd. better than investing in RKS Ltd.?
   (b) If you invest 30% in BBS Ltd. and 70% in RKS Ltd.?
   (c) What is your expected rate of return and portfolio standard deviation?
   (d) What is the market portfolio's expected rate of return and how much is the risk-free rate?
6. The probabilities and associated returns of Modern Foods Ltd., are given below:

Return (%)	12	15	18	20	24	26	30
Probability	0.05	0.10	0.24	0.26	0.18	0.12	0.05

   Calculate the standard deviation.
7. Elucidate the methodology for measuring risk and return.
8. Analyse the ways in which the portfolio diversification help in reducing risk.
9. Suppose you have ₹ 10,000 to invest and would like to sell ₹ 5,000 in stock XYZ short to invest in ABC. Assuming no correlation between the two securities, compute the expected return and the standard deviation of the portfolio from the following characteristics:

Security	**ABC**	**XYZ**
E(R)	.12	.02
σ (R)	.08	.10

10. "Risk & expected return are the two key determinants of an investment decision." Justify.
11. The rate of return of equity shares of Anand Rathi Mills Ltd. For past 5 years are given below:

Year	**Rate of return (%)**
1	12
2	16
3	18
4	20
5	–6

    Calculate the average rate of return, standard deviation and variance.
12. Elucidate the mechanism for the calculation of minimum risk portfolio with two assets.

Answers: Self Assessment

1. systematic
2. Market
3. Uncertainties
4. True

5. False
6. True
7. Return
8. Dispersion
9. capital appreciation
10. True
11. False.

Notes

4.12 Further Readings



Books

Chandra, P., *Financial Management - Theory and Practice,* New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Notes

Unit 5: Cost of Capital

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Objectives

After studying this unit, you will be able to:

- Recognize the significance of cost of capital;
- Discuss the basic aspects of the concept of cost of capital;
- Categorize the costs;
- Identify the factors that affect cost of capital.

Introduction

The cost of capital is an important concept in formulating a firm's capital structure. Cost of capital is a central concept in financial management. It is also viewed as one of the corner stones in the theory of financial management. It has received considerable attention from both theorists and practitioners. Two major schools of thought, have emerged having basic difference on the relevance of cost of capital. In one camp, Modigliani Miller argued, that a firm's cost of capital is constant and it is independent of the method and level of financing. In another camp (traditionalists) cost of capital is varying and dependent on capital structure. In both the camps, optimal policy is taken as the policy that maximizes the value of a company.

Notes

Cost of capital is still largely an academic term and the problem of measuring it in operational terms is a recent phenomena. Prior to this development, the problem was either ignored or by passed. In modern times, it is widely used as basis of investment projects and evaluating the alternative sources of finance.

5.1 Cost of Capital – Concept

The term cost of capital is a concept having many different meanings. The three viewpoints, regarding the cost of capital is given below:

1. ***From Investors' View Point:*** Investor may define it as "the measurement of the sacrifice made by him in capital formation."



Example: Mr. A an investor invested in a company's equity shares, amount ₹ 1,00,000, instead of investing in a bank at the rate of 7 per cent interest. Here he had sacrificed 7 per cent interest for not having invested in the bank.

2. ***Firms Point:*** It is the minimum required rate of return needed to justify the use of capital.



Example: A firm raised ₹ 50 lakhs through the issues of 10 per cent debentures, for justifying this issue, a minimum rate of return it has to earn is 10 per cent.

3. ***Capital Expenditure Point:*** The cost of capital is the minimum required rate of return, the hurdle or target rate or the cut off rate or any discounting rate used to value cash flows.



Example: Firm 'A' is planning to invest in a project, that requires ₹ 20 lakh as initial investment and provides cash flows for a period of 5 years. So for the conversion of future 5 years cash flows into present value, cost of capital is needed.

Cost of capital represents the rate of return that the firm must pay to the fund suppliers, who have provided the capital. In other words, cost of capital is the weighted average cost of various sources of finance used by the firm. The sources are, equity, preference, long-term debt and short-term debt.

"*The rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due.*"

– Hunt, William and Donaldson

"*Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditures.*"

– Solomon Ezra

"*A cut-off rate for the allocation of capital to investments of projects. It is the rate of return on a project that will leave unchanged the market price of the stock.*"

– James C. Van Horne

"*The rate of return the firm requires, from investment in order to increase the value of the firm in the market place.*"

– Hampton, John J

Thus, as defined above, we can say, that cost of capital is that minimum rate of return, which a firm must and is expected to earn on its investments so as to maintain the market value of its shares. It is also known as Weighted Average Cost of Capital (WACC), composite cost of capital or combined cost of capital. It is expressed in terms of percentage.

Notes

Basic Aspects of Cost of Capital

The above definitions indicates, that the following are the three basic aspects of the concept of cost of capital:

1. ***Rates of Return:*** Cost of capital is not a cost as such, in fact, it is the rate of return that a firm requires to earn from its investment projects.
2. ***Minimum Rate of Return:*** Cost of capital of any firm is that minimum rate of return that will at least maintain the market value of the shares.
3. ***Cost of capital comprises three components:***
   (a) The risk less cost of the particular type of financing (r_j)
   (b) The business risk premium, (b) and
   (c) The financial risk premium (f)

Symbolically cost of capital may be represented as: $K_o = r_j + b + f$

Self Assessment

Fill in the blanks:

1. Cost of capital represents the …… that the firm must pay to the fund suppliers, who have provided the capital.
2. Cost of capital is expressed in terms of …… .
3. Investor defines Cost of capital as "the measurement of the sacrifice made by him in …… ."

5.2 Importance/Significance of Cost of Capital

The concept of cost of capital is very important and the central concept in financial management decisions. The decisions in which it is useful are as follows:

1. ***Designing Optimal Corporate Capital Structure:*** This concept is helpful in formulating a sound and economical capital structure for a firm. The debt policy of a firm is significantly influenced by the cost consideration. Capital structure involves determination of proportion of debt and equity in capital structure that provides less cost of capital.



Caution While designing a firm's capital structure, the financial executives always keep in mind minimisation of the over all cost of capital and to maximise value of the firm.

The measurement of specific costs of each source of funds and calculation of weighted average cost of capital help to form a balanced capital structure. By comparing various (sources of finance) specific costs, he/she can choose the best and most economical source of finance and can succeed in designing a sound and viable capital structure.

2. ***Investment Evaluation/Capital Budgeting:*** Wilson R.M.S., states that the Cost of Capital is a concept, which should be expressed in quantitative terms, if it is to be useful as a cut-off rate for capital expenses. Capital expenditure means investment in long-term projects like investment on new machinery. It is also known as Capital budgeting expenditure. Capital budgeting decisions require a financial standard (cost of capita) for evaluation.

Notes

The financial standard is Cost of Capital. In the Net Present Value (NPV) method, an investment project is accepted, if the present value of cash inflows are greater than the present value of cash outflow. The present values of cash inflows are calculated by discounting the rate known as Cost of Capital. If a firm adopts Internal Rate of Return (IRR) as the technique for capital budgeting evaluation, investment should be accepted only when cost of capital is less than the calculated IRR. Hence, the concept of cost of capital is very much useful in capital budgeting decisions, particularly if a firm is adopting discounted cash flow methods of project evaluation.

3. ***Financial Performance Appraisal:*** Cost of capital framework can be used to evaluate the financial performance of top management. Financial performance evaluation involves a comparison of actual profitability of the investment project with the project overall cost of capital of funds raised to finance the project. If the actual profitability is more than the projected cost of capital, then the financial performance may said to be satisfactory and vice-versa.

   The above discussion clearly shows the role of cost of capital in financial management decisions. Apart from the above areas (decisions), cost of capital is also useful in (distribution of profits), capitalization of profits, making to rights issue and investment in owner assets.

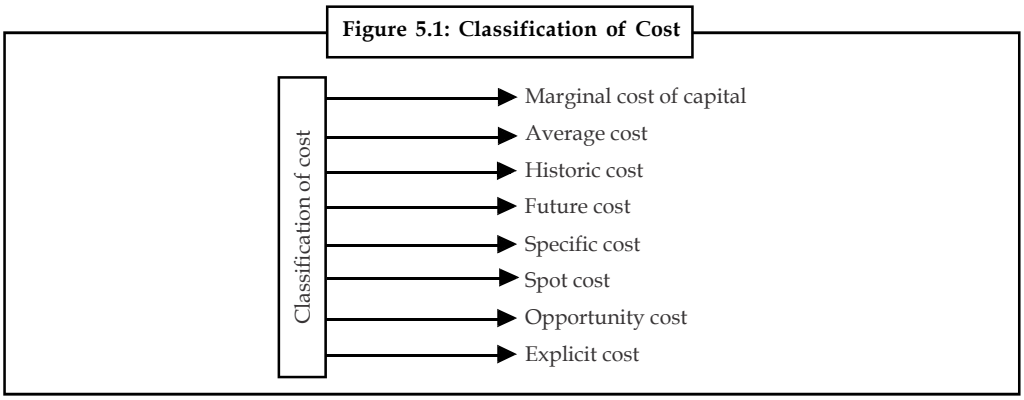
Self Assessment

Fill in the blanks:

4. The …….. policy of a firm is significantly influenced by the cost consideration.
5. In the Net Present Value (NPV) method, the present values of cash inflows are calculated by discounting the rate known as …….. .
6. If the …….. is more than the projected cost of capital, then the financial performance may said to be satisfactory.

5.3 Classification of Cost

Figure 5.1: Classification of Cost



Before going to discuss the computation of specific cost of each source of funds and cost of capital, it is wise to know various relevant costs associated with the problem of measurement of cost of capital. The relevance costs are:

1. ***Marginal Cost of Capital:*** A marginal cost is the additional cost incurred to obtain additional funds required by a firm. It refers to the change in the total cost of capital resulting from the use of additional funds. The marginal cost of capital is a very important concept in investment decisions (capital budgeting decisions).

Notes

2. ***Average Cost/Composite/Overall Cost:*** It is the average of various specific costs of the different components of equity, preference shares, debentures, retained earnings of capital structure at a given time and this is used as the acceptance criteria for (capital budgeting) investment proposals.

3. ***Historic Cost/Book Cost:*** The book cost has its origin in the accounting system in which book values, as maintained by the books of accounts, are readily available. They are related to the past. It is in common use for computation of cost of capital. For example, cost of capital may be computed based on the book value of the components of capital structure.



Did u know? Historical costs act as guide for future cost estimation.

4. ***Future Cost:*** It is the cost of capital that is expected to raise funds to finance a capital budget or investment proposal.

5. ***Specific Cost:*** It is the cost associated with particular component/source of capital. It is also known as component cost of capital. For example, cost of equity (Ke) or cost of preference share (Kp), or cost of debt (Kd), etc.

6. ***Spot Cost:*** The costs that are prevailing in the market at a certain time. For example, few years back cost of bank loans (house loans) was around 12 per cent, now it is 6 per cent is the spot cost.

7. ***Opportunity Cost:*** The opportunity cost is the benefit that the shareholder foregoes by not putting his/her funds elsewhere because they have been retained by the management. For example, an investor, had invested in a company's equity shares (100 shares, each share at ₹ 10). The company decided to declare dividend of 10 per cent on book value of share, but due to capital requirements it retains its investment on one project that is having return on investment (RoI) of 4 per cent. Elsewhere, the project rate of interest (banks) is at 6 per cent. Here, the opportunity cost to the investor is (6-4) 2 per cent.

8. ***Explicit Cost:*** Cost of capital can be either explicit or implicit. Distinction between explicit and implicit is important from the point of view of computation cost of capital. An explicit cost of any source of capital is the discount rate that equates the present value of the cash inflows, that are incremental to the taking of the financing opportunity with present value of its increments cash outflows. In other words, the discount rate that equates the present value of cash inflows with present value of cash outflows. It is also called as the internal rate of return. For example, a firm raises ₹ 1,00,000 through the sale of 12 per cent perpetual debentures. There will be a cash inflow of ₹ 1,00,000 and a cash outflow of ₹ 12,000 every year for a indefinite period. The rate that equates the PV of cash inflows (₹ 1,00,000) and PV of cash outflows (₹ 12,000 per year) would be the explicit cost. Computation of explicit cost is almost similar to the computation of IRR, with one difference.

9. ***Implicit Cost:*** It is the cost of opportunity, which is given up in order to pursue a particular action. It is also known as implicit cost of capital. The implicit cost of capital of funds raised and invested by the firm may, therefore be defined as "the rate of return associated with the best investment opportunity for the firm and its shareholders that would be foregone, if the projects presently under consideration by the firm were accepted. The cost of retained earnings is an opportunity cost of implicit cost for a shareholder, who is deprived of the opportunity to invest retained earnings elsewhere. Funds raised by any form of financing have implicit capital costs once they are invested. Thus, in a sense, implicit costs may also be viewed as opportunity costs. This implies that a project reflects negative PV, when its cash flows are discounted by the implicit cost of capital.

Self Assessment

Notes

Fill in the blanks:

7. A …….... cost is the additional cost incurred to obtain additional funds required by a firm.
8. …….... is the cost of capital that is expected to raise funds to finance a capital budget or investment proposal.
9. …….... Cost is the cost that is prevailing in the market at a certain time.

5.4 Measurement of Specific Cost of Capital

The financial manager has to compute the specific cost of each type of funds needed in the capitalisation of a company. The company may resort to different financial sources (equity share, preference share, debentures, retained earning public deposits; or it may prefer internal source (retained earnings) or external source (equity, preference and public deposits). Generally, the component cost of a specific source of capital is equal to the investors' required rate of returns. Investors required rate of returns are interest, discount on debt, dividend, capital appreciation, earnings per share on equity shareholders, dividend and share of profit on preference shareholders funds. But investors' required rate of returns should be adjusted for taxes in practice for calculating the cost of a specific source of capital, to the firm.

Compensation of specific source of finance, viz., equity, preference shares, debentures, retained earnings, public deposits is discussed below:

5.4.1 Cost of Equity

Firms may obtain equity capital in two ways (a) retention of earnings and (b) issue of additional equity shares to the public. The cost of equity or the returns required by the equity shareholders is the same in both the cases, since in both cases, the shareholders are providing funds to the firm to finance their investment proposals. Retention of earnings involves an opportunity cost. The shareholders could receive the earnings as dividends and invest the same in alternative investments of comparable risk to earn returns. So, irrespective of whether a firm raises equity finance by retaining earnings or issue of additional equity shares, the cost of equity is same. But issue of additional equity shares to the public involves a floatation cost whereas, there is no floatation cost for retained earnings. Hence, issue of additional equity shares to the public for raising equity finance involves a bigger cost when compared to the retained earnings.

In the following cost of equity is computed in both sources point of view (i.e., retained earnings and issue of equity shares to the public).

Cost of Retained Earnings (K_{re})

Retained earnings is one of the internal sources to raise equity finance. Retained earnings are those part of (amount) earnings that are retained by the form of investing in capital budgeting proposals instead of paying them as dividends to shareholders. Corporate executives and some analysts too normally consider retained earnings as cost free, because there is nothing legally binding the firm to pay dividends to equity shareholders and the company has its own entity different from its stockholders. But it is not so. They involve opportunity cost. The opportunity cost of retained earning is the rate of return the shareholder forgoes by not putting his/her funds elsewhere, because the management has retained the funds. The opportunity cost can be well computed with the following formula.

Notes

$$K_{re} = K_e\left(\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

Where,

K_e = Cost of equity capital [D ÷ NP or E/P + g].

T_i = Marginal tax rate applicable to the individuals concerned.

T_b = Cost of purchase of new securities/broker.

D = Expected dividend per share.

NP = Net proceeds of equity share/market price.

g = Growth rate in (%).

Illustration 1: A company paid a dividend of ₹ 2 per share, market price per share is ₹ 20, income tax rate is 60 per cent and brokerage is expected to be 2 per cent. Compute the cost of retained earnings.

Solution:

$$K_{re} = \left(\frac{D}{NP}\times\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

$$= \left(\frac{2}{20}\times\frac{(1-0.60)}{(1-0.02)}\right)\times 100$$

$$= 0.10 \times 0.409 \times 100 = 4.1 \text{ per cent}$$

Illustration 2: ABC company's cost of equity (K_e) capital is 14 per cent, the average tax rate of individual shareholders is 40 per cent and it is expected that 2 per cent is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution:

$$K_{re} = \left(K_e\times\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

$$= 0.14\times\frac{(1-0.4)}{(1-0.02)}\times 100$$

$$= (0.14 \times 0.613) \times 100 = 8.6 \text{ per cent}$$

Illustration 3: Life Style Garment Manufacturing Company has net earnings of ₹ 20 lakhs and all of its stockholders are in the bracket of 50 per cent. The management estimates that under the present conditions, the stockholder's required rate of returns is 12 per cent. 3 per cent is the expected brokerage to be paid if stockholders want to invest in alternative securities. Compute the cost of retained earnings.

Solution:

$$K_{re} = K_e\left(\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

$$= \left(0.10\times\frac{(1-0.50)}{(1-0.03)}\right)\times 100$$

$$= (0.10 \times 0.516) \times 100 = 5.2 \text{ per cent}$$

Notes

Illustration 4: BPL company's equity share is currently being sold at ₹ 350.75 and it is currently paying a dividend of ₹ 5.25 per share. The dividend is expected to grow at 15 per cent per annum for one year. Income tax rate is 40 per cent and brokerage is 2 per cent. Calculate cost of retained earnings.

Solution:

$$K_{re} = \left(\frac{D}{NP} + g \times \frac{(1 - T_i)}{(1 - T_b)}\right) \times 100$$

$$= \left(\frac{5.25}{350.75} + 0.15 \times \frac{1 - 0.40}{1 - 0.02}\right) \times 100$$

= [0.165 0.613] 100 = 10.2 per cent

Cost of Issue of Equity Shares (K_e)

Calculation of cost of equity (K_e) capital cost brings forth, a host of problems. It is the most difficult and controversial cost to measure because there is no one common basis for computation. For calculation of cost of debt (K_d) interest charge is the base and preference dividend is the base for calculation of cost of preference shares (K_p). Interest on debentures/debt and dividend on preference shares is fixed in terms of the stipulations following the issue of such debentures and shares. In contrast, the return on equity shareholders solely depends upon the discretion of the company management. Apart from this, there is no stipulation for payment of dividend to equity shareholders. They are ranked at the bottom as claimants on the assets of the company at the time of liquidation. Though it is quite evident from the above discussion that, equity capital does not carry any cost. However, this is not true, equity capital has some cost.

The cost of equity capital (K_e), may be defined as the minimum rate of returns that a firm must earn on the equity financed portions of an investment project in order to leave unchanged the market price of the shares. The cost of equity is not the out-of-pocket cost of using equity capital as the equity shareholders are not paid dividend at a fixed rate every year.

There are some approaches available to calculate the cost of equity capital, they are:

Dividends Capitalisation Approach (D/MN Approach)

According to this approach, the cost of equity capital is calculated on the basis of a required rate of return in terms of the future dividends to be paid on the shares. Accordingly, K_e is defined as the discount rate that equates the present value of all expected future dividends per share, along with the net proceeds of the sale (or the current market price) of a share. It means investor arrives at a market price for a share by capitalizing dividends at a normal rate of return. The cost of equity capital can be measured by the given formula:

K_e = D/CMP or NP

Where,

K_e = Cost of equity

D = Dividends per share

CMP = Current market price per share

NP = Net proceed per share

This method assumes that investor give prime importance to dividends and risk in the firm remains unchanged and it does not consider the growth in dividend.

Notes

Illustration 5: XYZ Ltd., is currently earning ₹ 1,00,000, its current share market price of ₹ 100 outstanding equity shares is 10,000. The company decides to raise an additional capital of ₹ 2,50,000 through issue of equity shares to the public. It is expected to pay 10 per cent per share as floatation cost. Equity capital is issued at a discount rate of 10 per cent, per share. The company is interested to pay a dividend of ₹ 8 per share. Calculate the cost of equity.

Solution:

$$K_e = \frac{D}{NP} \times 100$$

$$K_e = \frac{₹\ 8}{(100 - 10 - 10)} \times 100$$

$$K_e = \frac{₹\ 8}{80} \times 100$$

= 10 per cent



Notes Dividend capitalization approach, suffers from the following limitations:

1. It does not consider future earnings.
2. It ignores the earnings on retained earnings.
3. It ignores the fact that market price raise may be due to retained earnings and not on account of high dividends.
4. It does not take into account the capital gains.

Earnings Capitalisation Approach (E/MP Approach)

According to this approach, the cost of equity (K_e) is the discount rate that equates the present value of expected future earnings per share with the net proceeds (or current market price) of a share. The advocates of this approach establish a relationship between earnings and market price of the share. They say that, it is more useful than the dividend capitalisation approach, due to two reasons, one, the earnings capitalization approach acknowledges that all earnings of the company, after payment of fixed dividend to preference shareholders, legally belong to equity shareholders whether they are paid as dividends or retained for investment, secondly, and most importantly, determining the market price of equity shares is based on earnings and not dividends. Computation of retained earnings cost, taken separately leads to double the company's cost of capital. Assumption of earnings capitalization approach is employed under the following conditions:

1. Constant earnings per share over the future period;
2. There should be either 100 per cent rotation ratio or 100 per cent dividend pay out ratio; and
3. The company satisfies the requirements through equity shares and does not employ debt.

Cost of equity can be calculated with the following formula:

$$K_e = \frac{E}{CMP \text{ or } NP}$$

Where,

Notes

K_e = Cost of equity

E = Earnings per share

CMP = Current market price per share

NP = Net proceeds per share.

Illustration 6: Well do Company Ltd. is currently earning 15 per cent operating profit on its share capital of ₹ 20 lakh (FV of ₹ 200 per share). It is interested to go for expansion for which the company requires an additional share capital of ₹ 10 lakh. Company is raising this amount by the issue of equity shares at 10 per cent premium and the expected floatation cost is 5 per cent. Calculate the cost of equity.

Solution:

$$K_e = \frac{E}{NP} \times 100$$

$$= \frac{₹\ 30}{(₹\ 200+20-10)} \times 100$$

$$= \frac{₹\ 30}{₹\ 210} \times 100$$

= 14.3 per cent

1. Calculation of EPS

   Operating Profit = ₹ 20,00,000 × 0.15 = ₹ 3,00,000

   No.of Equity Shares = 20,00,000/200 = 10,000 Shares

   EPS = 3,00,000/10,000 = ₹ 30

2. Net Proceeds (NP) = Face value + Premium – Floatation cost

   = 200 + 20 – 10 = ₹ 210

Illustration 7: A firm is currently earning ₹ 1,00,000 and its share is selling at a market price of ₹ 90. The firm has 10,000 shares outstanding and has no debt. Compute the cost of equity.

Solution:

$$K_e = \frac{E}{MP} \times 100$$

$$= \frac{₹\ 10}{90} \times 100 = 11.11$$

Limitations: Earnings capitalization approach has the following limitations:

1. All earnings are not distributed to the equity shareholders as dividends.
2. Earning per share may not be constant.
3. Share price also does not remain constant.

Dividend Capitalization Plus Growth Rate Approach [(D/MP) + g]

Computation of cost of equity capital based on a fixed dividend rate may not be appropriate, because the future dividend may grow. The growth in dividends may be constant perpetually or

Notes

may vary over a period of time. It is the best method over dividend capitalisation approach, since it considers the growth in dividends. Generally, investors invest in equity shares on the basis of the expected future dividends rather than on current dividends. They expect increase in future dividends. Growth in dividends will have positive impact on share prices.

Cost of Capital under Constant Growth Rate Perpetually

The formula for computation of cost of equity under constant growth rate is:

$$K_e = \frac{D}{NP \text{ or } CMP} + g$$

Where,

K_e = Cost of equity capital

D = Dividends per share.

NP = Net proceeds per share.

CMP = Current market price per share.

g = Growth rate (%).

Illustration 8: Equity shares of a paper manufacturing company is currently selling for ₹ 100. It wants to finance its capital expenditure of ₹ 1 lakh either by retaining earnings or selling new shares. If company seeks to sell shares, the issue price will be ₹ 95. The expected dividend next year is ₹ 4.75 and it is expected to grow at 6 per cent perpetually. Calculate cost of equity capital (internal and external).

Solution:

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

$$K_e = \frac{4.75}{100} + 0.06$$

= 0.048 + 0.06 = 10.8 per cent

Calculate cost of external equity (Issue of shares)

$$K_e = \frac{4.75}{95} + 0.06$$

= 0.050 + 0.06 = 11 per cent

Cost of Capital under Variable Growth Rate

The computation cost of equity after a specific period, is based on the estimation of growth rate in dividends of a company. Expected growth rate will be calculated based upon the past trend in dividend. It may not be unreasonable to project the trend into the future, based on the past trend. The financial manager must estimate the internal growth rate in dividends on the basis of long range plans of the company. Expected growth rate in the internal context requires to be adjusted. Compound growth rate in dividends can be computed with the following formula.

$$gr = D_o (1 + r)^n = D_n$$

Where,

gr = Growth rate in dividends.

D_o = First year dividend payment.

Notes

$(1 + r)^n$ = Present value factor for 'nth' year.

D_n = Last year dividend payment.

Illustration 9: From the following dividends record of a company, compute the expected growth rate in dividends.

Year	1996	1997	1998	1999	2000	2001	2002	2003
Dividends per share (₹)	21	22	23	24	25	26	27	28

Solution:

$gr = D_o (1 + r)^n = Dn = 21 (1 + r)^7 = 28$

$(1 + r)^7 = 28 \div 21 (1 + r)^7 = 1.334$

During seven years the dividends has increased by ₹ 7 giving a compound factor of 1.334. The growth rate is 4 per cent since the sum of Re. 1 would accumulate to ₹ 1.334 in seven years at 4 per cent interest.

Illustration 10: Mr. A an investor, purchases an equity share of a growing company for ₹ 210. He expects the company to pay dividends of ₹ 10.5, ₹ 11.025 and ₹ 11.575 in years 1, 2 and 3 respectively and he expects to sell the shares at a price of ₹ 243.10 at the end of three years.

1. Determine the growth rate in dividends.
2. Calculate the current dividend yield.
3. What is the required rate of return of Mr. A on his equity investment?

Solution:

1. ***Computation of growth rate (gr)***

   $gr = D_o (1 + r)^n = D_n = ₹ 10.5 (1 + r)^2 = ₹ 11.575$

   $(1+r)^2 = \frac{11.575}{10.5}$

   $(1 + r)2 = 1.103$

   gr = 5 per cent

2. ***Calculation of the current dividend yield***

   3rd year dividend ₹ 11.575

   Current dividend yield = $\frac{11.575}{100} \times 105 = ₹ 2.154$

   Growth in dividend is [12.154 – 11.575] = 0.579

   Current dividend yield $\frac{0.579}{11.575} \times 100 = 5$ per cent

   In simple words, current dividend yield is equal to growth rate in dividends.

3. ***Mr. A's required rate of return***

   $K_e = \frac{D}{\text{Expected sales price (MP)}} + g$

Notes

$$= \frac{₹\ 12.154}{243.10} + 0.05$$

$$= 0.050 + 0.05 = 0.10 \times 100 = 10 \text{ per cent}$$

Illustration 11: (Variable growth rates): A textile company's dividends have been expected to grow in the following manner.

1 – 2 years	15 per cent
3 – 5 years	10 per cent
6 year and beyond	5 per cent

The company currently pays a dividend of ₹ 2 per share, which is currently selling at ₹ 75 per share. What would be the cost of equity capital assuming a fixed dividend pay out ratio?

Solution:

$$NP = \sum_{t=1}^{n} \frac{D_0(1+gr)^t}{(1+K_e)^t} + \frac{D_{n+1}}{K_e - g^n} \times \frac{1}{(1+K_e)^n}$$

$$75 = \frac{2.3}{(1+K_e)^1} + \frac{2.645}{(1+K_e)^2} + \frac{2.9095}{(1+K_e)^3} + \frac{3.200}{(1+K_e)^4} + \frac{3.52}{(1+K_e)^5} + \frac{3.52(1+0.05)}{(1+K_e)^5} \times \frac{1}{(1+K_e)^5}$$

$$= 2.3\left(PVIF_{1.K_e}\right) + 2.645\left(PVIF_{2.K_e}\right) + 2.9095\left(PVIF_{3.K_e}\right) + 3.2\left(PVIF_{4.K_e}\right) +$$

$$3.52\left(PVIF_{5.K_e}\right) + \frac{3.696\left(PVIF_{6.K_e}\right)}{K_e - 0.05}$$

By trial and error method using PV tables, we find K_e = 14%

First trial at 14%

$$75 = 2.3(0.877) + 2.645(0.769) + 2.909(0.675) + 3.2(0.592) + 3.52(0.519) + \frac{3.696}{0.14 - 0.05} \times (0.456)$$

75 = 2.02 + 2.03 + 1.96 + 1.89 + 1.83 + 18.73

75 = 28.5

Here, 75 is not equal to 28.5, for increasing the 28.5 to 75 we have to try at a lower rate, say 6%

$$75 = 2.3(0.943) + 2.645(0.890) + 2.907(0.840) + 3.2(0.823) + 3.52(0.747) + \frac{3.696}{0.06 - 0.05} \times (0.705)$$

= 2.17 + 2.35 + 2.44 + 2.63 + 2.63 + 260.568 = 272.79

New PV of cash out flows exceeding cash inflow. So, we will use interpolation formula

$$K_e = 6\% + \left((14\% - 6\%)\frac{272.79 - 75}{272.79 - 28.5}\right)$$

$$= 6\% + 8\%\left(\frac{197.79}{244.29}\right)$$

Ke = 6% + 6.48 = 12.48 per cent.

Notes

Bond Yield Plus Risk Premium Approach

According to this approach, the rate of return required by the equity shareholder of a company is equal to

$$K_e = \text{Yield on long-term bonds} + \text{Risk premium}$$

The logic of this approach is very simple, equity investors bear a higher risk than bond investors and hence their required rate of return should include a premium for their higher risk. In other words, bond holders and equity shareholders, both are providing funds to the company, but the company assures a fixed rate of interest to the bond holders and not to the equity shareholders, hence, there is a risk involved due to uncertainty of expected dividends. It makes a sense to base the cost of equity on a readily observable cost of debt. The problem involved in this approach, is the addition of premium, should it be one per cent, two per cent, three per cent or 'n' per cent. There is no theoretical basis for estimating the risk premium. Most analysts look at the operating and financial risks of the business and arrive at a subjectively determined risk premium that normally ranges between 3 per cent to 5 per cent. Cost of equity capital calculated, based on this approach is not a precise one, but it is a ballpark estimation.

Computation of the cost of equity based on dividends capitalisation and earnings capitalisation, have serious limitations. It is not possible to estimate future dividends and earnings correctly, both these variables are uncertain. In order to remove the difficulty in the estimation of the rate of return that investors expect on equities, where future dividends, earnings and market price of share are uncertain, Realised Yield Approach is suggested.



Did u know? **What is Realised Yield Approach?**

Realised Yield Approach takes into consideration that, the actual average rate of returns realised in the past few years, may be applied to compute the cost of equity share capital i.e., the average rate of returns realised by considering dividends received in the past few years along with the gain realised at the time of sale of share.

This is more logical because the investor expects to receive in future at least what he has received in the past. The realised yield approach is based on the following assumptions:

1. Firms risk does not change over the period.
2. Past realised yield is the base for shareholders expectations.
3. There is no opportunity cost to investors.
4. Market price of equity share does not change significantly.

Calculation of the cost of equity based on realised yield approach is not realistic, due to unrealistic assumptions.

Illustration 12: XYZ Company is planning to sell equity shares. Mr. A is planning to invest in XYZ Company by purchasing equity shares. Bond yield of XYZ Company is 12 per cent. Mr. A, an investor requests you to calculate his required rate of return on equity with 3 per cent risk premium.

Solution:

K_e = Bond yield + Risk premium = 10% + 3% = 13 per cent

Illustration 13: An investor purchased equity share of HPH company at ₹ 240 on 01.01.1998 and after holding it for 5 years sold the share in early 2003 at ₹ 300. During this period of 5 years, he

Notes

received a dividend of ₹ 14 in 1998 and 1999 and ₹ 14.5 from 2000 to 2002. Calculate the cost of equity capital based on realised yield approach with 10 per cent discounting factor.

Solution:

Years	Cash inflows (₹)	DF 10%	PV of Cash inflows (₹)
1998	14.0	0.909	12.7
1999	14.0	0.826	11.6
2000	14.5	0.751	10.9
2001	14.5	0.683	9.9
2002	14.5	0.621	9.0
2003	300.0	0.621	186.3
			240.4
		(-) Purchase price in 1998	240.0
			0.4

At 10 per cent discount rate, the total PV of cash inflows equals to the PV of cash outflows. Hence, cost of equity capital is 10 per cent.

Capital Asset Pricing Model (CAPM)

CAPM provides a framework for measuring the systematic risk of an individual security and relates it to the systematic risk of a well diversified portfolio. In the context of CAPM, the risk of an individual security is defined as the volatility of the security's return vis-à-vis the return of a market portfolio. The risk (volatility) of individual securities is measured by β (beta). Beta is a measure of a security's risk relative to the market portfolio. Since diversifiable risk does not matter, beta is thus a measure of systematic risk of a security.

Risk free security has no volatility and it has a zero beta:

The Capital Asset Pricing Model is given in equation:

$$K_1 = R_f + b_1 \times (km - Rf)$$

Where K_1 = required rate of an asset I

R_f = risk-free rate of return, commonly measured by return on treasury bills or government securities

b_1 = beta coefficient or index of non diversifiable risk for the asset I

K_m = market rate of return on the market portfolio of assets

The CAPM can be divided into two parts (1) risk-free interest Rf which is required return on a risk free asset typically treasury bill or short-term government security and (2) the risk premium. These are respectively the two elements on the either side of the plus sign in the above equation. The $(k_m - R_f)$ portion of the risk premium is called the market risk premium, because it represents the premium - the investor must receive for taking the average amount of risk associated with holding the market portfolio of assets.

The risk premium is the highest for small company stocks, followed by large company stocks, long-term corporate bonds, and long-term government bonds. Small company stocks are riskier than large company stocks, which are riskier than long-term corporate bonds (equity is riskier than debt instrument).

Long-term corporate bonds are riskier than long-term government bonds (because the government is less likely to ravage on debt). And of course, treasury bills and short-term government securities because of no default risk, very short maturity virtually risk-free as indicated by zero risk premium.

Notes

Other things being equal, the higher the beta, the higher the required return and lower the beta, the lower the required return.

Illustration 14: B Co. Ltd., wishes to determine the required rate of return on an asset Z, which has a beta of 1.5. The risk free rate of return is 7%, the return on market portfolio of assets is 11%. Thus we get:

$$Kz = 7\% + 1.5\ (11\% - 7\%) = 7\% + 6\% = 13\%$$

The market risk premium 4% (11% – 7%) when adjusted for the assets index of risk (beta) of 1.5, results in a risk premium of 6% (1.5 × 4%). That risk premium when added to 7% risk-free return, results in 13% required return.

Assumptions of CAPM

1. ***Market efficiency:*** The capital markets are efficient. The capital market efficiency implies that share prices reflect all available information.
2. ***Risk aversion:*** Investors are risk-averse. They evaluate a security's return and risk in terms of the expected return and variance or standard deviation respectively. They prefer the highest expected return for a given level of risk.
3. ***Homogenous expectations:*** All the investors have the same explanation about the expected return and risk of securities.
4. ***Single time period:*** All investors can lend or borrow at risk-free rate of interest.
5. ***Risk-free rate:*** All investors can lend or borrow at a risk-free rate of interest.

Interpreting Beta: The beta of a portfolio can be easily estimated by using the betas of the individual assets it includes. Suppose w_1, represent the proportion of the portfolio's total rupee value represented by asset j, and let β, denotes beta of the asset, the portfolio beta

$$\beta p = (w_1 \times \beta_1) + (w_2 \times \beta_2) + \ldots\ldots\ldots\ldots (\overset{wn}{i=1} \times \beta n) = \sum^{n} w_1 \times \beta_1$$

of course $\sum_{i=1}^{n}$ = I which means that 100 per cent of the portfolio's assets must be included in the computation.

Portfolio betas are interpreted in the same way as the betas of individual assets. They indicate the degree of responsiveness of the portfolio's return to changes in the market return. For example, when the market return increases by 10 per cent, a portfolio with a beta of 0.75 will experience a 7.5 per cent increase in its return (0.75 × 10%).

Again since beta measures the relative volatility of a security's return, in relation to the market return, it should be measured in terms of security's and markets' covariance and markets variance. Thus b1 can be measured by:

$$\beta_1 = \frac{Cov_{(K_i, K_m)}}{\sigma^2} = \frac{\sigma_1 \sigma_m Cor_{jm}}{\sigma_m^2} = \frac{\sigma_1 Cor_{jm}}{\sigma_m}$$

Where, k_i = The expected return on non-diversifiable security

K_m = The expected return on market portfolio

σ_1 = Standard deviation of the security

σ_m = Standard deviation of the market portfolio

Notes

$Cov_{(K_i, K_m)}$ = Covariance of security with regard to market portfolio

Cor_{jm} = Correlation coefficient of the security with the market

Illustration 15: An investor is seeking the price to pay for a security whose standard deviation is 3.00 per cent. The correlation coefficient for the security with the market is 0.8 and the market standard deviation is 2.2 per cent. The return for government securities is 7.2 per cent and from the market portfolio 12.8 per cent. The investors know that, by calculating the required return he can determine the price to pay for the security. What is the required return on the security?

Solution:

$$\text{Beta Coefficient} = \frac{0.8 \times 0.03}{0.022} = 1.0909$$

$$\text{Required rate of return} = 0.072 + 1.0909 \times (0.128 - 0.072)$$

$$= 0.072 + 0.061 = 0.133$$

Limitations of CAPM

1. It is based on unrealistic assumptions that are far from reality. For example, it is very difficult to find a risk-free security, since inflation causes uncertainty about the real rate of return. The assumption of the equality of lending and borrowing rate is also not correct. Further, investors may not hold highly diversified portfolio or the market indices may not be well-diversified.
2. It is difficult to test the validity of CAPM from a practical point of view.
3. Betas do not remain stable over time. Beta is a measure of a security's future risk. But investors do not have future data to estimate beta. What they have are past data about the share prices and market portfolio. Thus, they can only estimate beta based on historical data. Investors can use historical data as the measure of future risk only if it is a stable over time. This implies that historical betas are poor indicators of the future risk of securities.

Despite the limitations of CAPM, it provides a useful conceptual framework for evaluating and linking risk and return. An awareness of the trade-off and an attempt to consider risk as well as return in financial decision-making should help financial managers achieve their goals.

5.4.2 Cost of Preference Shares

The preference share is issued by companies to raise funds from investors. Preference share has two preferential rights over equity shares, (i) preference in payment of dividend, from distributable profits, (ii) preference in the payment of capital at the time of liquidation of the company.

Computation of cost of preference share capital have some conceptual difficulty. Payment of dividend is not legally binding on the company and even if dividends are paid, they are not a charge on earnings, they are distributed from distributable profits. This may create an idea that preference share capital is cost free, which is not true.

The cost of preference share capital is a function of the dividend expected by the investors. Generally, preference share capital is issued with an intention (a fixed rate) to pay dividends. In case dividends are not paid, it will affect the firm's fund raising capacity. For this reason, dividends on preference share capital should be paid regularly except when the firm does not make profits.

Notes

There are different types of preference shares, cumulative and non-cumulative, redeemable and irredeemable, participating and non-participating, and convertible and non-convertible. But computation of cost of preference share will be only for redeemable and irredeemable.

Cost of Irredeemable Preference Share/Perpetual Preference Share

The share that cannot be paid till the liquidation of the company is known as irredeemable preference share. The cost is measured by the following formula:

$$K_p \text{ (without tax)} = \frac{D}{CMP \text{ or } NP}$$

Where,

K_p = Cost of preference share.

D = Dividend per share.

CMP = Market price per share.

NP = Net proceeds.

Cost of irredeemable preference stock (with dividend tax)

$$K_p \text{ (with tax)} = \frac{D(1+D_t)}{CMP \text{ or } NP}$$

Where,

D_t = tax on preference dividend

Illustration 16: HHC Ltd., issues 12 per cent perpetual preference shares of face value of ₹ 200 each. Compute cost of preference share (without tax).

Solution:

$$K_p = \frac{D}{NP} \times 100$$

$$K_p = \frac{24}{200} \times 100 = 12 \text{ per cent}$$

Illustration 17: (with dividend tax): A company is planning to issue 14 per cent irredeemable preference share at the face value of ₹ 250 per share, with an estimated flotation cost of 5%. What is the cost of preference share with 10% dividend tax.

Solution:

$$K_p = \frac{D(1+D_t)}{NP} \times 100$$

$$= \frac{35(1+0.10)}{237.5} \times 100 = 16.21 \text{ per cent}$$

Illustration 18: Sai Ram & Co. is planning to issue 14 per cent perpetual preference shares, with face value of ₹ 100 each. Floatation costs are estimated at 4 per cent on sales price. Compute (a) cost of preference shares if they are issued at (i) face/par value, (ii) 10 per cent premium, and (iii) 5 per cent discount, (b) compute cost of preference share in these situation assuming 5 per cent dividend.

Notes

Solution:

Without dividend tax	With dividend tax
(i) Issued at face value $K_p = \frac{14}{(100-4)} = 14.6$ per cent	(i) Issued at face value $K_p = \frac{(141+0.05)}{96} = 15.4$ per cent
(ii) Issued at 10% premium $K_p = \frac{14}{(110-4)} = 13.2$ per cent	(ii) Issued at 10% premium $K_p = \frac{(141+0.05)}{106} = 13.9$ per cent
(iii) Issued at 5% discount $K_p = \frac{14}{(100-5-3.8)} = 15.4$ per cent	(iii) Issued at 5% discount $K_p = \frac{(141+0.05)}{91.2} = 16.2$ per cent

Cost of Redeemable Preference Shares

Shares that are issued for a specific maturity period or redeemable after a specific period are known as redeemable preference shares. The explicit cost of redeemable preference shares is the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividend and principal repayments. In other words, cost of preference share is the discount rate that equates the present value of cash inflows (sale proceeds) with the present value of cash outflows (dividend + principal repayment). Dividends will be paid at the end of each year, but the principal amount will be repaid either in lump sum at the end of maturity period or in installments (equal or unequal). If the principal amount is paid in installments, then the cash outflow for each year equals to dividend plus part of principal amount. Cost of preference shares, when the principal amount is repaid in one lump sum amount:

$$NP = \sum_{t=1}^{n} \frac{D^t}{(1+K_p)^t} + \frac{P_n}{(1+K_p)^n}$$

$$NP = \frac{D_1}{(1+K_p)^1} + \frac{D_2}{(1+K_p)^2} + \frac{D_3}{(1+K_p)^3} + ... + \frac{P_n}{(1+K_p)^n}$$

Where,

K_p = Cost of preference share.

NP = Net sales proceeds (after discount, flotation cost).

D = Dividend on preference share.

P_n = Repayment of principal amount at the end of 'n' years.

Illustration 19: (Lump sum repayment): A company issues ₹ 1,00,000, 10 per cent preference shares of ₹ 100 each redeemable after 10 years at face value. Cost of issue is 10 per cent. Calculate the cost of preference share.

Solution:

$$NP = \sum_{t=1}^{n} \frac{D^t}{(1+K_p)^t} + \frac{P_n}{(1+K_p)^n}$$

$$90 = \sum_{t=1}^{10} \frac{10}{(1+K_p)^t} + \frac{₹\ 100}{(1+K_p)^{10}}$$

The trial and error method is used here, for the computation of the cost of preference share.

Notes

Year	Cash outflow (₹)	PV factor		Present Values	
		10%	12%	10%	12%
1 - 10	10	6.145	5.650	61.45	56.5
10	100	0.386	0.322	38.60	32.2
Total PV of Cash outflow				**100.05**	**88.70**
(-) PV of Cash inflow				90.00	90.00
				10.05	(-) 1.3

In trials, PV of cash outflow did not equal to the PV of cash inflow (₹ 100). Hence, cost of preference share is calculated by using interpolation formula.

$$K = LDF(\%) + \left((HDF - LDF) \frac{LDFPV - PV \text{ of } CIF}{LDFPV - HDFPV} \right)$$

Where,

LDF = Lower discounting factor in %.

LDFPV = Lower discounting factor present value (₹).

HDFPV = Higher discounting factor present value (₹).

PV of CIF = Present value of cash inflows.

$$Kp = 10\% + \left((12\% - 10\%) \frac{100.05 - 90}{100.05 - 88.7} \right)$$

$$= 10\% + \left(2 \times \frac{10.05}{11.35} \right)$$

$$= 10\% + 2 \times 0.886 = 10\% + 1.772$$

= 11.77 per cent

Short cut formula:

$$K_p = \frac{D + (f + d + p_r - p_i)/N_m}{(RV + NP)/2}$$

Where,

D = Dividend per share.

f = Flotation cost (₹).

d = Discount on issue of preference share (₹).

p_r = Premium on redemption of preference shares (₹).

p_i = Premium on issue of preference share (₹).

N_m = Term of preference shares.

RV = Redeemable value of preference share.

NP = Net proceeds realized.

$$K_p = \frac{10 + (10 + 0 + 0 - 0)/10}{(100 + 90)/2}$$

$$= \frac{10 + (1)}{95} = 11.579 \text{ per cent}$$

Notes

5.4.3 Cost of Debentures/Debt/Public Deposits

Companies may raise debt capital through issue of debentures or loan from financial institutions or deposits from public. All these resources involve a specific rate of interest. The interest paid on these sources of funds is a charge on the profit & loss account of the company. In other words, interest payments made by the firm on debt issue qualify tax deduction in determining net taxable income. Computation of cost of debenture or debt is relatively easy, because the interest rate that is payable on debt is fixed by the agreement between the firm and the creditors. Computation of cost of debenture or debt capital depends on their nature. The debt/debentures can be perpetual or irredeemable and redeemable cost of debt capital is equal to the interest paid on that debt, but from company's point of view it will be less than the interest payable, when the debt is issued at par, since the interest is tax deductible. Hence, computation of debt is always after tax cost.

Cost of Irredeemable Debt/Perpetual Debt

Perpetual debt provides permanent funds to the firm, because the funds will remain in the firm till liquidation. Computation of cost of perpetual debt is conceptually relatively easy. Cost of perpetual debt is the rate of return that lender expect (i.e., fixed interest rate). The coupon rate or the market yield on debt can be said to represent an approximation of cost of debt. Bonds/ debentures can be issued at (i) par/face value, (ii) discount and (iii) premium. The following formulae are used to compute cost of debentures or debt of bond:

(i) Pre-tax cost

$$K_{di} = \frac{I}{P \text{ or } NP}$$

(ii) Post-tax cost

$$K_{di} = \frac{I(1 - t)}{P \text{ or } NP}$$

Where,

K_{di} = Pre-tax cost of debentures.

I = Interest

P = Principal amount or face value.

NP = Net sales proceeds.

t = Tax rate.

Illustration 20: XYZ Company Ltd., decides to float perpetual 12 per cent, debentures of ₹ 100 each. The tax rate is 50 per cent. Calculate cost of debenture (pre- and post-tax cost).

Solution:

(i) ***Pre-tax cost***

$$K_{di} = \frac{₹\ 12}{100} = 12 \text{ per cent}$$

(ii) ***Post-tax cost***

$$K_{d} = \frac{12(1 - 0.5)}{100} = 6 \text{ per cent}$$

Notes

Generally, cost of debenture is equal to the interest rate, when debenture is issued at par and without considering tax. Cost will be less than the interest when we calculate cost after considering tax since it is tax deductible. From the cost of capital point of view, debenture cost is always in post tax cost.

Sometimes debentures may be issued at premium or discount. A company, which is having a good track record, will be issued at premium and a company that is new or unknown to the public or has a nominal or poor track record will be issued at discount. Whenever debentures are issued at premium or discount the cost of debenture will be affected, it will decrease or increase respectively.

Illustration 21: Rama & Co. has 15 per cent irredeemable debentures of ₹ 100 each for ₹ 10,00,000. The tax rate is 35 per cent. Determine debenture assuming it is issued at (i) face value/par value (ii) 10 per cent premium and (iii) 10 per cent discount.

Solution:

Issued at	Pre-tax	Post-tax
(i) Face value	$\frac{₹\ 15}{100}$ = 15 percent	$\frac{15(1–0.35)}{100}$ = 9.8 percent
(ii) 10% premium	$\frac{₹\ 15}{110}$ = 13.7 percent (100+10)	$\frac{15(1–0.35)}{110}$ = 8.9 percent
(iii) 10% discount	$\frac{₹\ 15}{90}$ = 16.67 percent (100–10)	$\frac{15(1–0.35)}{90}$ = 10.9 percent

Cost of Redeemable Debentures/Debt

Redeemable debentures that, are having a maturity period or are repayable after a certain given period of time. In other words, these type of debentures that are under legal obligation to repay the principal amount to its holders either at certain agreed intervals during the duration of loan or as a lump sum amount at the end of its maturity period. These type of debentures are issued by many companies, when they require capital for fulfilling their temporary needs.

Cost of Redeemable Debentures:

$$K_d = \sum_{t=1}^{n} \frac{NI_t}{(1+K_d)^t} + \frac{P_n}{(1+K_d)^n}$$

Where,

K_d = Cost of debentures.

n = Maturity period.

NI = Net interest (after tax adjustment).

P_n = Principal repayment in the year 'n'.

Illustration 22: BE Company issues ₹ 100 par value of debentures carrying 15 per cent interest. The debentures are repayable after 7 years at face value. The cost of issue is 3 per cent and tax rate is 45 per cent. Calculate the cost of debenture.

Solution:

$$(100 - 3) = \sum_{t=1}^{7} \frac{15(1-0.45)}{(1+K_d)^t} + \frac{100}{(1+K_d)^n}$$

Notes

Year	Cash outflow (₹)	DF		PV of Cash Outflows (₹)	
		7%	10%	7%	10%
1 - 7	8.25	5.389	4.868	44.96	40.16
7	100	0.623	0.513	62.30	51.30
	PV of cash out flows			**106.76**	**91.46**
(-) PV of Cash inflows				97.00	97.00
				9.76	**5.54**

Cost of debenture capital lies between 10 per cent and 12 per cent, because net present value ₹ 97 lies between the PV of 10 per cent and 12 per cent. Exact cost can be computed only with interpolation formula:

$$K_d = LDF + \left((HDF - LDF) \frac{LDFPV - NP}{LDFPV - HDFPV} \right)$$

Where,

LDF = Lower discounting factor.

HDF = Higher discounting factor.

LDFPV = Lower discounting factor present value.

HDFPV = Higher discounting factor PV.

PVCIF = Present value of cash inflows

NP = Net proceeds.

$$K_d = 7\% + \left[3 \times \frac{106.76 - 97}{106.76 - 91.46} \right]$$
$$= 7\% + 1.91 = 8.91\%$$

Short cut method

$$K_p = \frac{I(1-t) + (f + d + p_r - p_i)/N_m}{(RV + NP)/2}$$

Where,

I = Interest

t = Tax rate

f = Flotation cost

d = Discount

p_r = Premium on redemption

p_i = Premium on issue

RV = Redeemable value

NP = Net proceed

N_m = Maturity period of debt

$$K_p = \frac{15(1 - 0.45) + (3 - 0 + 0 - 0)/7}{(100 - 97)/2}$$

$$K_p = \frac{8.68}{98.5} = 8.81\%$$

Notes

Illustration 23: (Instalment repayment): Hari Ram & Co. issued 14 per cent debentures aggregate at ₹ 2,00,000. The face value of debenture is ₹ 100. Issue cost is 5 per cent. The company has agreed to repay the debenture in 5 equal instalment at par value. Instalment starts at the end of the year. The company's tax rate is 35 per cent. Compute cost of debenture.

Solution:

Sales proceeds = Face value – Flotation cost = ₹ 100 – 5 = ₹ 95

Instalment amount = Face value ÷ No. of installments = 100 ÷ 5 = ₹ 20.

Years	Cash Outflow (₹)	DF Factor		PV of Cash Outflows (₹)	
	(NI + Instalment)	8%	13%	8%	13%
1	9.1 + 20 = 29.1	0.926	0.885	26.947	25.754
2	7.28 + 20 = 27.28	0.857	0.783	23.379	21.361
3	5.46 + 20 = 25.46	0.794	0.693	20.216	17.644
4	3.64 + 20 = 23.64	0.735	0.613	17.376	14.492
5	1.82 + 20 = 21.82	0.681	0.543	14.860	11.849
	PV of cash out flows			**102.778**	**91.230**
	PV of cash inflows			95.000	95.000
				(+) 7.778	(-)3.770

$$K_d = 8\% + \left((13 - 8) \times \frac{102.778 - 95}{102.778 - 91.1} \right)$$

$$= 8\% + \left(5 \times \frac{7.778}{11.678} \right)$$

= 8% + 3.33 = 11.33 per cent

Self Assessment

Fill in the blanks:

10. Cost of debenture is equal to the……., when debenture is issued at par and without considering tax.
11. Cost of preference share is the ……that equates the present value of cash inflows with the present value of cash outflows.
12. Retention of earnings involves an …….cost.

5.5 Weighted Average Cost of Capital (WACC)

A company has to employ a combination of creditors and fund owners. The composite cost of capital lies between the least and most expensive funds. This approach enables the maximisation of profits and the wealth of the equity shareholders by investing the funds in projects earning in excess of the overall cost of capital.

The composite cost of capital implies an average of the costs of each of the source of funds employed by the firm property, weighted by the proportion they hold in the firm's capital structure.

Notes

5.5.1 Steps Involved in Computation of WACC

1. Determination of the type of funds to be raised and their individual share in the total capitalisation of the firm.
2. Computation of cost of specific source of funds.
3. Assignment of weight to specific costs.
4. Multiply the cost of each source by the appropriate assigned weights.
5. Dividing the total weighted cost by the total weights to get overall cost of capital.

Once the company decides the funds that will be raised from different sources, then the computation of specific cost of each component or source is completed after which, the third step in computation of cost of capital is, assignment of weights to specific costs, or specific sources of funds. How to assign weights? Is there any base to assign weights? How many types of weights are there?

Assignment of Weights: The weights to specific funds may be assigned, based on the following:

1. ***Book Values:*** Book value weights are based on the values found on the balance sheet. The weight applicable to a given source of fund is simply the book value of the source of fund divided by the book value of the total funds.

   The merits of book values weights are:

   (a) Calculation of weights is simple.

   (b) Book values provide a usable base, when firm is not listed or security is not actively traded.

   (c) Book values are really available from the published records of the firm.

   (d) Analysis of capital structure in terms of debt – equity ratio is based on book value.

   Disadvantage of book value weights: Book value proportions are not consistent with the concept of cost of capital because the latter is defined as the minimum rate of return to maintain the market value of the firm.

   Caution There is no relation between book values and present economic values of the various sources of capital.

2. ***Capital Structure Weights:*** Under this method, weights are assigned to the components of capital structure based on the targeted capital structure. Depending up on the target, capital structures have some difficulties. They are:

   (a) A company may not have a well defined target capital structure.

   (b) It may be difficult to precisely estimate the components of capital costs, if the target capital is different from present capital structure.

3. ***Market Value Weights:*** Under this method, assigned weights to a particular component of capital structure is equal to the market value of the component of capital divided by the market value of all components of capital and capital employed by the firm.

   Advantages of Market Value Weights:

   (a) Market values of securities are approximately close to the actual amount to be received from their sale.

Notes

(b) Costs of the specific resources of funds that constitute the capital structure of the firm, are calculated by keeping in mind the prevailing market prices.

Disadvantages of Market Value Weights:

(a) Market values may not be available when a firm is not listed or when the securities of the firm are very thinly traded.

(b) Market value may be distorted when securities prices are influenced by manipulation loading.

(c) Equity capital gets greater importance.



Did u know? Most of the financial analysts prefer to use market value weights because it is theoretically consistent and sound.

Illustration 24: A firm has the following capital structure as the latest statement shows:

Source of Funds	₹	After Tax Cost (%)
Debt	30,00,000	4
Preference shares	10,00,000	8.5
Equity share	20,00,000	11.5
Retained earnings	40,00,000	10
Total	**100,00,000**	

Based on the book values compute the cost of capital.

Solution:

Source of Finance	Weights	Specific Cost (%)	Weighted Cost
Debt	0.30	0.04	0.012
Preference shares	0.10	0.08	0.008
Equity share	0.20	0.11	0.022
Retained earnings	0.40	0.10	0.040
	1.00		**0.082**

Overall cost of capital (K_o) = Total Weighted Cost × 100

= 0.082 × 100 = 8.2 per cent

Cost of Weight

$$\text{Debt weight} = \frac{\text{Debt capital}}{\text{Total capital}} = \frac{30,00,000}{1,00,00,000} = 0.30$$

Illustration 25: XYZ company supplied the following information and requested you to compute the cost of capital based on book values and market values.

Source of Finance	Book Value (₹)	Market Value (₹)	After Tax Cost (%)
Equity capital	10,00,000	15,00,000	12
Long-term debt	8,00,000	7,50,000	7
Short-term debt	2,00,000	2,00,000	4
Total	**20,00,000**	**24,50,000**	

Solution:

Computation of Cost of Capital based on Book Value

Notes

Source of Finance	Book Value (₹)	Weights	Specific cost	Weighted cost
(1)	(2)	(3)	(4)	(5) = (3) × (4)
Equity capital	10,00,000	0.50	0.12	0.060
Long-term debt	8,00,000	0.40	0.07	0.028
Short-term debt	2,00,000	0.10	0.04	0.004
Total	**20,00,000**	**1.00**		**0.092**

Cost of capital = 0.092 × 100 = 9.2 per cent

Cost of Capital based on Market Value Weight

Source of Finance	Book Value (₹)	Weights	Specific cost	Weighted cost
(1)	(2)	(3)	(4)	(5) = (3) × (4)
Equity capital	15,00,000	0.613	0.12	0.074
Long-term debt	7,50,000	0.307	0.07	0.022
Short-term debt	2,00,000	0.080	0.04	0.003
	24,50,000	**1.000**		**0.099**

Cost of capital = 100 × 0.099 = 9.9 per cent

Weighted Average Cost of Capital (Alternative Method)

Source of Finance	Market Value (₹)	Cost (%)	Total Cost
(1)	(2)	(3)	(4) = (2) × (3)
Equity capital	15,00,000	0.12	1,80,000
Long-term debt	7,50,000	0.07	52,500
Short-term debt	2,00,000	0.04	8,000
	24,50,000		**2,40,500**

$$\text{WACC} = \frac{\text{Total Cost}}{\text{Total Capital}}$$

$$= \frac{2,40,500}{24,50,000} \times 100 = 9.9\% \quad \text{approx.} = 10 \text{ per cent}$$

5.5.2 Marginal Cost of Capital

Companies may rise additional funds for expansion. Here, a financial manager may be required to calculate the cost of additional funds to be raised. The cost of additional funds is called marginal cost of capital. For example, a firm at present has ₹ 1,00,00,000 capital with WACC of 12 per cent, but it plans to raise ₹ 5,00,000 for expansion, such as additional funds, the cost that is related to this ₹ 5 lakhs is marginal cost of capital.

The weighted average cost of new or incremental, capital is known as the marginal cost of capital. The marginal cost of capital is the weighted average cost of new capital using the marginal weights. The marginal weights represent the proportion of various sources of funds to be employed in raising additional funds.

Notes The marginal cost of capital shall be equal to WACC, when a firm employs the existing proportion of capital structure and some cost of component of capital structure. But in practice WACC may not be equal to marginal cost of capital due to change in proportion and cost of various sources of funds used in raising new capital. The marginal cost of capital ignores the long-term implications of the new financing plans. Hence, WACC should be preferred, to maximise the shareholders wealth in the long-term.

Notes

Illustration 26: HLL has provided the following information and requested you to calculate (a) WACC using book-value weights and (b) weighted marginal cost of capital (assuming that specified cost do not change).

Source of Finance	Amount (₹)	Weights (%)	After tax cost (%)
Equity capital	14,00,000	0.452	9
Preference capital	8,00,000	0.258	12
Debentures	9,00,000	0.290	16

HLL wishes to raise an additional capital of ₹ 12,00,000 for the expansion of the project. The details are as follows:

Equity capital	₹ 3,00,000
Preference capital	₹ 3,00,000
Debentures	₹ 6,00,000

Solution:

Computation of WACC

Source of Finance	Weights	After tax Cost (%)	Weighted Cost
Equity capital	0.452	0.09	0.041
Preference capital	0.258	0.12	0.031
Debentures	0.290	0.16	0.046
			0.118

WACC = 0.118 × 100 = 11.8 per cent

Computation of Weighted Marginal Cost of Capital (WACC)

Source of Finance	Marginal Weights	After tax Cost (%)	Weighted marginal cost
Equity capital	0.50	0.09	0.045
Preference capital	0.25	0.12	0.030
Debentures	0.25	0.16	0.040
			0.115

WACC = 0.115 × 100 = 11.5 per cent

5.5.3 Factors Affecting WACC

Weighted average cost of capital is affected by a number of factors. They are divided into two categories such as:

1. ***Controllable Factors:*** Controllable factors are those factors that affect WACC, but the firm can control them. They are:

   (a) *Capital Structure Policy:* As we have assured, a firm has a given target capital structure where it assigns weights based on that target capital structure to calculate WACC. However, a firm can change its capital structure or proportions of components of capital that affect its WACC. For example, when a firm decides to use more debt and less equity, which will lead to reduction of WACC. At the same time increasing proportion of debt in capital structure increases the risk of both debt and equity holder, because it increases fixed financial commitment.

Notes

(b) *Dividend Policy:* The required capital may be raised by equity or debt or both. Equity capital can be raised by issue of new equity shares or through retained earnings. Sometimes companies may prefer to raise equity capital by retention of earnings, due to issue of new equity shares, which are expensive (they involve flotation costs). Firms may feel that retained earnings is less costly when compared to issue of new equity. But if it is different it is more costly, since the retained earnings is income that is not paid as dividends hence, investors expect more return and so it affects the cost of capital.

(c) *Investment Policy:* While estimating the initial cost of capital, generally we use the starting point as the required rate of return on the firm's existing stock and bonds. Therefore, we implicitly assume that new capital will be invested in assets of the same type and with the same degree of risk. But it is not correct as no firm invest in assets similar to the ones that currently operate, when a firm changes its investment policy. For example, investment in diversified business.

2. ***Uncontrollable Factors:*** The factors that are not possible to be controlled by the firm and mostly affects the cost of capital. These factors are known as External factors.

(a) *Tax Rates:* Tax rates are beyond the control of a firm. They have an important effect on the overall cost of the capital. Computation of debt involves consideration of tax. In addition, lowering capital gains tax rate relative to the rate on ordinary income makes stocks more attractive and reduces cost of equity and lower the overall cost of capital.

(b) *Level of Interest Rates:* Cost of debt is interest rate. If interest rates increases, automatically cost of debt also increases. On the other hand, if interest rates are low then the cost of debt is less. The reduced cost of debt decreases WACC and this will encourage an additional investment.

(c) *Market Risk Premium:* Market risk premium is determined by the risk in investing proposed stock and the investor's aversion to risk. Market risk is out of control risk, i.e., firms have no control on this factor.

The above are the important factors that affect the cost of capital.



Task Weighted average of cost of capital may be determined using book value and market value weights. Compare the pros and cons of using market value weights rather than book value weights in calculating WACC.

Self Assessment

Fill in the blanks:

13. The weighted average cost of new or incremental, capital is known as the …… .
14. Book value weights are based on the values found on the …….. .
15. The …….. cost of capital lies between the least and most expensive funds.

Notes



Case Study

Nike, Inc. – Cost of Capital

On July, Kimi-ford, a portfolio manager at North Point Group, a mutual-fund-management firm, pored over analysts' write-ups of Nike, Inc., the athletic-shoe manufacturer. Nike's share price had declined significantly from the start of the year. Ford was considering buying some shares for the fund she managed, the North Point Large-Cap Fund, which invested mostly in fortune 500 companies, with an emphasis on value investing. Its top holdings included Exxon Mobile. General Motors, McDonald's, 3M, and other large-cap. It had performed extremely well. In 2000, the fund earned a return of 20.7 per cent even as the S&P 500 fell 10.1 per cent. The fund's year-to-date returns at the end of June 2001 stood at 6.4 versus the S&P - 7.3 per cent.

Only a week ago, on June 28,2001, Nike held an analyst' meeting to disclose its fiscal-year 2001 results. The meeting, however had another purpose: Nike management wanted to communicate a strategy for revitalizing the company. Since 1997 Nike's revenues had plateaued at around $9 billion, while net income had fallen from almost $ 800 million to $580 million (see Exhibit 1). Nike's markets in the U.S. had fallen from 48 per cent in 1997 to 42 per cent in 2000. In addition, recent supply-chain issues and the adverse effect of a strong dollar had negatively affected revenue.

At the meeting, the management revealed plans to address both-line growth and operating performance. To boost revenue, the company would develop more athletic-shoe products in the mid-priced segment - a segment that had been overlooked in the recent years. Nike also planned to push its apparel line, which, under the recent leadership of industry veteran Mindy Grossman had performed extremely well. On the cost side, Nike would exert more effort on expense control, finally, the company's executives reiterated their long-term revenue growth targets of 8-10 per cent and earnings-growth targets of above 1 percent.

The Analysts reactions were mixed. Some thought, the financial targets too aggressive ; other saw significant growth opportunities in apparel and in Nike's international businesses.

Ford read all the analysts reports that she could find about the June 28 meeting, but the reports gave her no clear guidance: a Lehman Brothers report recommended a "Strong Buy", while UBS analysts expressed misgiving about the company and recommended a "Hold". Ford decided instead to develop her own discounted-cash-flow forecast to come to a clearer conclusion.

Her forecast showed that, at discount rate of 12 per cent, Nike was overvalued at its current share price of $42.09 (see Exhibit 2). She had, however, done a quick sensitivity analysis that revealed Nike was valued at discount rates below 11.2 per cent. As she was about to go into a meeting, she asked her new assistant, Joanna Cohen, to estimate Nike's cost of capital.

Cohen immediately gathered all the data she though she might need (Exhibits 1,2,3 and 4) began to work on her analysis. At the end of the day, she submitted her cost-of-capital estimate and a memo (Exhibit 5) explaining her assumption to Ford.

Contd...

Notes

Exhibit 1: Consolidated Income Statements Year ended May 31

(in millions excepts per share data)	2000	2001	2002	2003	2004	2005	2006
Revenues	4,760.8	6,470.6	9,816.5	9,553.1	8,776.9	8,995.1	9,488.8
Cost of goods sold	2,865.3	3,906.7	5,503.0	6,065.5	5,493.5	5,403.8	7,784.9
Gross profit	1,895.6	2,563.9	3,683.5	3,487.6	3,283.4	3,591.3	3,703.9
Selling and administrative	1,209.8	1,588.6	2,303.7	2,623.8	2,426.6	2,606.4	2,689.7
Operating Income	685.8	975.3	1,379.8	863.8	856.8	984.9	1,014.2
Interst expense	24.2	39.5	52.3	60.0	44.1	45.0	58.7
Other expense net	11.7	36.7	32.3	20.9	21.5	23.2	34.1
Restructuring charge,net	---	---	---	129.9	45.1	2.5	---
Income before Income taxes	649.9	899.1	1,295.20	653.0	746.1	919.2	921.4
Income taxes	250.2	345.9	499.4	253.4	294.7	340.1	331.7
Net Income	399.7	553.2	795.8	399.6	451.4	579.4	589.7
Diluted earning per Annum Shares	1.4	1.9	2.7	1.4	1.6	2.1	2.2
Average shares outstanding (diluted)	294.0	293.6	297.0	296.0	287.5	279.8	273.3
Growth(%)							
Revenue		35.9	42.0	4.0	8.1	2.5	5.5
Operating income		42.2	41.5	37.4	0.8	15.0	3.0
Net income		38.4	43.9	49.8	13.0	28.3	1.8
Margins (%)							
Gross margin		39.6	40.1	36.5	37.4	39.9	39.0
Operating margin		15.1	15.0	9.0	9.8	10.9	10.7
Net margin		8.5	8.7	4.2	3.1	6.4	6.2
Effective tax rate (%)		38.5	38.6	38.8	39.5	37.0	36.0

Exhibit 2: Discounted-Cash-flow Analysis

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Assumption										
Revenue growth (%)	7.0	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
COGS/Sales (%)	60.0	60.0	59.5	59.5	59.0	59.0	58.5	58.5	58.0	58.0
S & A / Sales (%)	28.0	27.5	27.0	26.5	26.0	25.5	25.0	25.0	25.0	25.0
Tax rate (%)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Current Assets / sales (%)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Current liabilities/ sales (%)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Yearly depreciations Equals capex.										
Cost of Capital (%)	12.0									
Terminal growth rate (%)	3.0									
Discounted cash flow										
Opeating income	1,218.4	1,351.6	1554.6	1717.0	1950.0	2135.9	2410.2	2554.8	2790.1	2957.5
Taxes	463.0	513.6	590.8	652.5	741.0	811.7	915.9	970.8	1060.2	1123.9
NOPAT	755.4	838.0	963.9	1064.5	1209.0	1324.3	1494.3	1584.0	1729.9	1833.7
Capex.net of dereciation	---	---	---	---	---	---	---	---	---	---
Change in NWC	8.8	-174.9	186.3	198.4	195.0	206.7	219.1	232.3	246.2	261.0
Free cash flow	764.1	663.1	776.6	866.2	1014.0	1176.6	1275.2	1351.7	1483.7	1572.7
Terminal value										17998.7
Total flows	764.1	663.1	776.6	866.2	1014.0	1176.6	1275.2	1351.7	1483.7	19571.5
Present value of flows	682.3	528.6	553.5	550.5	575.4	566.2	576.8	545.9	535.0	6301.5
Enterprise value	11415.7									
Less : current outstanding dept.	1296.6									
Equity value	10119.1									
Current shares outstanding	271.5									
Equity value per share	$37.27		Current share price		$42.09					

Contd...

Notes

Exhibit 3: Sensitivity of Equity Value of Discount Rate

Discount rate	Equity value
8.00%	$75.80
8.50	67.85
9.00	61.25
9.50	55.68
10.00	50.92
10.50	46.81
11.00	43.22
11.17	42.09
11.50	40.07
12.00	37.27

Exhibit 4: Consolidated Balance Sheets (in millions) May 31

	2005	2006
Assets		
Current assets		
Cash and equivalents	$254.3	$304.0
Accounts receivable	1,569.4	1,621.4
Inventories	1,446.0	1,424.0
Deferred income taxes	111.5	113.3
Prepaid expenses	215.2	162.5
Total Current assets	3,596.4	3,625.3
Property, plant and equipment, net	1,583.4	1,618.8
Identifiable, intangible assets and goodwill, net	410.9	397.3
Deferred income taxes and other assets	266.2	178.2
Total assets	**$5,856.9**	**$5,819.6**
Liabilities and shareholder's equity		
Current liabilities		
Current portion of long-term debt	$50.1	$5.4
Notes payable	924.2	855.3
Accounts payable	543.8	432
Accrued liabilities	621.9	472.1
Income taxes payable	-----	21.9
Total current liabilities	2,140.0	1,786.7
Long-term debt	470.3	435.9
Deferred income taxes and other liabilities	110.3	102.2
Redeemable preferred stock	0.3	0.3
Share holder equity		
Common stock, par	2.8	2.8
Capital in excess of stated value	369.0	459.4
Unearned stock comper	11.7	9.9
Accumulated other comprehensive income	111.1	152.1
Retained earnings	2887.0	3194.3
Total share holder equity	3136.0	3494.5
Total liabilities and shareholder's equity	**$5,856.9**	**$5,819.6**

Exhibit 5: Dr. Bhatt's Analysis

Subject: Nike's Cost of Capital

Based on the following assumptions, my estimate of Nike's cost of capital is 8.4 percent:

Contd...

Notes

Single or Multiple Costs of Capital

The first question I considered was whether to use single or multiple costs of capital given that Nike has multiple business segments. Aside from footwear, which makes up 62 per cent of revenue. Nike also sells apparel (30 per cent of revenue) that complement its footwear products. In addition, Nike sells sport balls, time-pieces, eyewear, skates, bats and other equipment designed for sports activities. Equipment products account for 3.6 per cent of revenue. Finally, Nike also sells some non- Nike branded products such as Cole-Haan dress and casual footwear, and ice stakes, skate blades, hockey sticks, hockey jerseys and other products under the Bauer trademark, non-Nike brands account for 4.5 per cent of the revenue.

I asked myself, whether Nike's different business segments shad enough risks from each other to warrant different costs of capital. Were their profiles really different? I concluded that it was only the Cole-Haan line that was somewhat different: the rest were all sports-related businesses. However, since Cole-Haan makes up only a tiny fraction of the revenues, I did not think it necessary to compute a separate cost of capital. As for the apparel and footwear lines, they are sold through the same marketing and distribution channels and are often marketed in "collections" of similar design. I believe, they face the same risk factors, as such, I decided to compute only one cost of capital of the whole company.

Methodology for Calculating the Cost of Capital; WACC

Since Nike is funded with both debt and equity, I used the Weighted Average Cost of Capital (WACC) method. Based on the latest available balance sheet, debt as a proportion of total capital makes up 27.0 per cent and equity accounts for 73.0 per cent:

Capital sources	**Book Values**	
Debt		
Current portion of long-term debt	$ 5.4	
Notes payable	855.3	
Long-term debt	435.9	
	$ 1.291.2	→ 27.0% of total capital
	$ 3.494.5	→ 72.0% of total capital

Cost of Debt

My estimate of Nike's cost of debt is 4.3 per cent. I arrived at this estimate by taking total interest expense for the year 2001 and dividing it by the company's average debt balance. The rare is lower than Treasury yields but that is because Nike raised a portion of its funding needs through Japanese yen notes, which carry rates between 2.0 per cent to 4.3 per cent.

After adjusting for tax, the cost of debt comes to 2.7 per cent. I used a tax rate of 38 per cent, which I obtained by adding state taxes of 3 per cent to the U.S. statutory tax rate. Historically, Nike's state taxes have ranged from 2.5 per cent to 3.5 per cent.

Cost of Equity

I estimated the cost of equity, using the Capital Asset Pricing Model (CAPM). Other methods such as the Dividend Discount Model (DDM) and the Earnings Capitalization Ratio can be used to estimate the cost of equity. However, in my opinion, the CAPM is the superior method.

Contd...

Notes

My estimate of Nike's cost of equity is 10.5 per cent I used the current yield on 20-year Treasury bonds as my risk-free rate, and the compound average premium of the market over Treasury bonds (5.9 per cent) as my risk premium. For beta, I took the average of Nike's beta from 1996 to the present.

Putting it all Together

After inputting all my assumptions into the WACC formula, my estimate of Nike's cost of capital is 8.4 per cent.

$$\begin{aligned} WACC &= K_d (1 - t) \times D/(D + E) + K_c \times E/(D + E) \\ &= 2.7\% \times 27.0\% + 20.5\% \times 73.0\% \\ &= 8.4\% \end{aligned}$$

Question

What is the importance of cost of capital for any firm?

5.6 Summary

- The cost of capital is viewed as one of the corner stones in the theory of financial management.
- Cost of capital may be viewed in different ways.
- Cost of capital is the weight average cost of various sources of finance used by the firm. It comprises the risk less cost of the particular type of financing (rj), the business risk premium, (b) and the financial risk premium (f).
- The cost of capital is useful in designing optimal capital structure, investment evaluation, and financial performance appraisal.
- The financial manager has to compute the specific cost of each type of funds needed in the capitalisation of a company.
- Retained earnings are one of the internal sources to raise equity finance.
- The opportunity cost of retained earning is the rate of return the shareholder forgoes by not putting his funds elsewhere.
- Cost of equity capital, is the minimum rate of return that a firm must earn on the equity financed portions of an investment project in order to leave unchanged the market price of the shares.
- The marginal cost of capital is the weighted average cost of new capital using the marginal weights.
- Marginal cost of capital shall be equal to WACC, when a firm employs the existing proportion of capital structure and some cost of component of capital structure.

5.7 Keywords

Cost of Capital: It is that minimum rate of return, which a firm must earn on its investments so as to maintain the market value of its shares.

Explicit Cost: It is the discount rate that equates the present value of the cash inflows with the present value of its increments cash outflows.

Notes

Future Cost: It is the cost of capital that is expected to raise the funds to finance a capital budget or investment proposal.

Implicit Cost: It is the cost of opportunity which is given up in order to pursue a particular action.

Marginal Cost of Capital: The additional cost incurred to obtain additional funds required by a firm.

Opportunity Cost: The benefit that the shareholder foregoes by not putting his/her funds elsewhere because they have been retained by the management.

Specific Cost: It is the cost associated with particular component or source of capital.

Spot Cost: The cost that are prevailing in the market at a certain time.

5.8 Review Questions

1. Examine the relevance of cost of capital in capital budgeting decisions.
2. Elucidate the importance of CAPM approach for calculation of cost of equity.
3. "Marginal cost of capital nothing but the average cost of capital". Explain.
4. Analyse the concept of flotation costs in the determination of cost of capital.
5. AMC Engineering Company issues 12 per cent, ₹ 100 face value of preference stock, which is repayable with 10 per cent premium at the end of 5 years. It involves a flotation cost of 5 per cent per share. What is the cost of preference share capital, with 5 per cent dividend tax?
6. "Evaluating the capital budgeting proposals without cost of capital is not possible." Comment.
7. VS International is thinking of rising funds by the issuance of equity capital. The current market price of the firm's share is ₹ 150. The firm is expected to pay a dividend of ₹ 3.9 next year. At present, the firm can sell its share for ₹ 140 each and it involves a flotation cost of ₹ 10. Calculate cost of new issue.
8. WACC may be determined using the book values & the market value weights. Compare the pros & cons of using market value weights rather than book value weights in calculating the WACC.
9. Critically evaluate the different approaches to the calculation of cost of equity capital.
10. A company issues 12,000, 12 per cent perpetual preference shares of ₹ 100 each. Company is expected to pay 2 per cent as flotation cost. Calculate the cost of preference shares assuming to be issued at (a) face value of par value, (b) at a discount of 5% and (c) at a premium of 10%.
11. An investor supplied you the following information and requested you to calculate. Expected rate of returns on market portfolio – Risk free returns = 10 per cent

Investment in Company			Initial price	Dividends	Year-end market price	Beta risk factor
A		Paper	20	2	55	0.7
		Steel	30	2	65	0.8
		Chemical	40	2	140	0.6
B		GOI Bonds	1000	140	1005	0.99

Notes

12. A company currently is maintaining 6 per cent rate of growth in dividends. The last year dividend was ₹ 4.5 per share. Equity share holders required rate of return is 15 per cent. What is the equilibrium price per share?
13. Karvy is planning to sell equity shares. Mr. Ram wishes to invest in Karvy Company by purchasing equity shares. The company's bond has been yielding at 13 per cent. You are requested by Mr. Ram to calculate his expected rate of return on equity based on bond yield plus risk premium approach (assuming 3 per cent as risk premium).
14. Sai Enterprises issued 9 per cent preference share (irredeemable) four years ago. The preference share that has a face value of ₹ 100 is currently selling for ₹ 93. What is the cost of preference share with 8 per cent tax on dividend?
15. Company has 50,000 preference shares of ₹ 100 at par outstanding at 11 per cent dividend. The current market price of the share is ₹ 90. What is its cost?

Answers: Self Assessment

1.	rate of return	2.	percentage
3.	capital formation	4.	debt
5.	Cost of Capital	6.	actual profitability
7.	marginal	8.	Future Cost
9.	Spot	10.	interest rate
11.	discount rate	12.	opportunity
13.	marginal cost of capital	14.	balance sheet
15.	composite		

5.9 Further Readings



Books

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Unit 6: Capital Budgeting

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Objectives

After studying this unit, you will be able to:

- Explain the meaning and process of Capital budgeting;
- Describe the methods of analyzing capital budgeting decisions;
- Define the conception of capital rationing;
- Discuss the capital decision under risk and uncertainty.

Notes

Introduction

As part of long range planning process decision is taken on the programme, the organization will undertake and the appropriate resources that will be allocated to each programme over the next few years. Hence, management's decision to expand or diversify emerges from the exercise of strategic planning. The techniques of capital budgeting are used to take such decisions.

6.1 Capital Budgeting Characterization

Definition

Capital budgeting may be defined as the decision-making process by which firms evaluate the purchase of major fixed assets such as machinery, equipment, buildings, acquisition of other firms either through the purchase of equity shares or group of assets to conduct an ongoing business. Capital budgeting describes the firm's formal planning process for the acquisition and investment of capital and results in a capital budget i.e., the firm's formal plan outlay for purchase of fixed assets.

Importance

Preparation of the firm's formal capital budget is necessary for a number of reasons:

1. ***It affects profitability:*** Capital budgeting decisions affect the profitability of the firm. They also have a bearing on the competitive position of the firm. They determine the future destiny of the company. An opportune investment decision can yield spectacular returns. On the other hand, an ill-advised and incorrect investment decision can endanger the very survival even of the large sized firms.
2. ***Effects are felt over long time periods:*** The effects of capital spending decisions will be felt by the firm over extended periods of time e.g., construction of a factory affects the company's future cost structure.
3. ***It involves substantial expenditures:*** Capital expenditure may range from a single piece equipment costing thousands of rupees to complete. Profit and other physical facilities costing crores of rupees.
4. ***Not easily reversible:*** Capital investment decisions once made, are not easily reversible without much financial loss to the firm, since there may be no market for second hand plant and equipment, or conversion to other uses may not be financially feasible.
5. ***Based on long-term policy decisions:*** Capital budgeting decisions should be based on long-term policy decisions and should rest firmly on organisation policies on growth, marketing, industry share, social responsibility and other matters and not taken on ad hoc basis.
6. ***Scarce capital resources:*** Capital investment involves cost and the majority of the firm's resources are limited. This underlines the need for thoughtful and correct investment decisions.
7. ***Difficulties in evaluation:*** Evaluation of capital investment proposals is difficult since the benefits from investment are received in some future period. Hence there is a substantial risk involved in estimation of the future benefits. Added to this, the possibility of shifts in consumer preferences, the actions of competitors, technological developments and changes in the economic and political environment. Even to quantify the future benefits in rupees is not an easy task.

Notes



Notes **Kinds of Proposals**

One can identify five types of proposals:

1. ***Replacement:*** As fixed assets are used they wear out or become outdated by new technology. Money may be budgeted to replace worn out or obsolete equipment.
2. ***Expansion:*** A firm has to grow, and therefore production facilities are to be added by way of single machinery or group of machines either for the same products or new products in the same area.
3. ***Diversification:*** A business can reduce the risk by operating in several markets rather than a single market. Firms seeking the facilities to enter new markets will consider proposals for the purchase of new machinery and facilities to handle the new products.
4. ***Research and development:*** Firms in industries where technology is rapidly changing will expend large sums of money for research and development of new products. If large sums of money are needed for equipment these proposals will normally be included in the capital budget.
5. ***Miscellaneous:*** A firm will frequently have proposals that do not directly help achieve profit-oriented goals e.g., installation of pollution control equipment. Safety items, such as automatic sprinkling systems to protect against fire, may involve considerable expenditures.

Self Assessment

Fill in the blanks:

1. …….. describes the firm's formal planning process for the acquisition and investment of capital.
2. Capital investment decisions once made, are not easily …….. without much financial loss to the firm

6.2 Capital Budgeting Process

A capital budgeting decision is a two-sided process:

1. Calculation of likely or expected return from the proposal. Here the focus is cash outflow at the beginning of the project and a stream of cash flow flowing into the firm over the life of the project. The calculation of expected return from cash outflow and cash inflows may be done by different methods discussed later.
2. To select a required return that a project must achieve before it is acceptable. The focus is the relationship between risk and 'return. Two methods may be used weighted average cost of capital (if project risk is identical to firms current risk) or capital asset pricing model (if project risk differs from firm's current risk).

The concept of cash outflow vs cash inflows: The following general rules to be followed:

1. Only cash flow is relevant: Cash flow should be differentiated with accounting profits.
2. Estimate cash flows on an incremented basis that follow from project acceptance.

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3. Estimate cash flows before interest basis. This is essential since capital budgeting is an evaluation technique based on discounting future cash flows by cost of capital. Estimate cash flows on an after tax basis. Some firms do not deduct tax payments.



Caution While working out cash flows debit or charge in account of interest and cut of capital should not be considered.

4. They try to offset this mistake by discounting the cash flows before taxes at a rate higher than the opportunity cost of capital. Unfortunately, there is no reliable formula for making such adjustments to the discount rate.

5. ***Do not confuse average with incremental profits:*** Most managers hesitate to throw good money after bad e.g., they are reluctant to invest more money in a loosing division. But occasionally, you will find "turnaround" opportunities in a looser are strongly positive.

6. Cash flows should be recorded only when they occur and not when the work is undertaken or the liability incurred.

7. ***Include all incidental effects:*** It is important to include all incidental effects on the remainder of the business.



Example: A branch line for a railroad may have negative net inflows when considered in isolation, but shall be a worthwhile investment when one allows for additional traffic that it brings to the main line.

8. ***Include working capital requirements:*** Most projects require additional investment in working capital on a continuous basis with increase in sales. This increase in working capital should be considered as a cash outflow in the relevant period. Similarly, when the project comes to an end, you can usually recover some of the investment, which will no longer be required, which will be treated as a cash inflow.

9. ***Forget sunk costs:*** They are past and irreversible outflows. Because sunk costs are bygones, they cannot be affected by the decision to accept or reject the proposal and so they should be ignored.

10. ***Include opportunity costs:*** The cost of a resource may be relevant to the investment decision even no cash changes hands. For example, suppose a new manufacturing operation uses land which otherwise could be sold for ₹ 10,00,000. This resource has an opportunity cost, which is the cash it could generate for the company, if the project is not taken up, and the resource sold or put to some other productive use.

11. ***Beware of allocated overhead costs:*** If the amount of overhead changes as a result of the investment decision, then they are relevant and should be included.

12. ***Effect of depreciation:*** Depreciation is a non-cash expense; it is important because it reduces taxable income. According to the income tax rules in India, depreciation is charged on the basis of the written down value method at the rates prescribed by Income Tax Rules. Hence, book profit has to be adjusted by the difference in depreciation (depreciation charged in books as per Companies Act and depreciation charged as per Income Tax Rules) to arrive at taxable income. Hence depreciation provides an annual tax shield equal to the product of depreciation and the marginal tax rate.

13. ***Treat inflation inconsistently:*** If the discount rate is stated in nominal terms, then consistency requires that cash flows be estimated in nominal terms, taking account of

Notes

trends in selling price, labour and material costs etc. This calls for more than simply applying a single assumed inflation rate to all components of cash flow. Tax shields on depreciation do not increase with inflation. They are constant in nominal terms because tax law in India allows only the original cost of assets to be depreciated.

14. ***Effect on other projects:*** Cash flow effects of the project under consideration. If it is not economically independent on other existing projects of the firm it must be taken into consideration.



Example: If the company is considering the production of a new product that competes with the existing products in the firms product line, it is likely that as a result of the new proposal, the cash flows related to the old product will be effected.

15. ***Tax effect from investment tax credit:*** An investment tax credit is a tax benefit allowed to business purchasing capital assets. The firm may claim a specified percentage of new capital investments as credit against income tax in the current year. This is in line with investment allowance provided in the Income Tax Act, 1961 earlier.

Conversion of Incremental Accounting Profit to Cash Inflow for Project Evaluation:

Year wise Incremental Cash Inflow = Year Wise Incremental Accounting Profit of any project (whether it be for new product or replacement of old Machinery with new machinery etc.) after tax, but, before interest + Depreciation + all other non-cash expenses – Non-cash revenue i.e., profit on sale of asset after the end of the project.

Self Assessment

Fill in the blanks:

3. A capital budgeting decision is a …….. process.

4. It is important to include all …….. effects on the remainder of the business.

6.3 Methods of Analyze Capital Budgeting Decisions

6.3.1 Traditional Techniques of Evaluation

Payback Period

Sometimes called the payout method i.e., a computationally simple project evaluation approach that has been used for many years. The procedure is to determine how long it takes a project to return the cost of the original investment.



Example: A project costing ₹ 20 lakhs yields annually a profit of ₹ 3 lakhs after depreciation @12.5% (straight line method) but before tax 50%. In this case cash inflow = Profit after tax + Depreciation = ₹ 3,00,000 – Tax ₹ 1,50,000 + Depre. ₹ 2,00,000 = ₹ 4,00,000 p.a.

$$\text{Payback period} = \frac{1,60,000 - 10,000}{15} = \frac{\text{Cost of the project}}{\text{Annual cash inflow}} = \frac{20,00,000}{4,00,000} = 5 \text{ years.}$$

The project with a lower payback period will be preferred. Sometimes, the management lays down policy guidelines regarding payback period.

Notes

Merits

1. This method is quite simple and easy to understand; it has the advantage of making it clear that there is no profit of any project unless the payback is over. When funds are limited it is always better to select projects having shorter payback periods. This method is suitable to industries where the risks of obsolescence are very high.
2. The payback period can be compared to a break-even point, the point at which costs are fully recovered, but profits are yet to commence.
3. The risk associated with a project arises due to uncertainty associated with the cash inflows. A shorter payback period means less uncertainty towards risk.

Limitations

1. The method does not give any considerations to time value of money. Cash flows occurring at all points of time are simply added.
2. This method becomes a very inadequate measure of evaluating two projects where cash inflows are uneven.
3. It stresses capital recovery rather than profitability. It does not take into account the returns from a project after its payback period. Therefore, this method may not be a good measure to evaluate where the comparison is between two projects one involving a long gestation period and other yielding quick results only for a short period.

Payback Reciprocal

A simple method of calculating the internal rate of return is the payback reciprocal which is 1 divided by the payback period.

Example: A project has an initial cash outlay of ₹ 2,00,000 followed by 10 years of annual cash savings of ₹, 50,000. The payback period is ₹ 2,00,000/₹ 50,000 = 4 years and the payback reciprocal is

$$\frac{1}{\text{Payback period}} = \frac{1}{4} = 25\%$$

A major drawback of the payback reciprocal that it does not indicate any cutoff period for the purpose of investment decision. It is, however, argued that the reciprocal of the payback would be a close approximation of the internal rate of return if the life of the project is at least twice the payback period and the project generates equal amount of the annual, cash inflows.

Accounting Rate of Return (ARR)

The Accounting Rate of Return (ARR) method of evaluating capital budgeting projects is so named because it parallels traditional accounting concepts of income and investment. A project is evaluated by computing a rate of return on the investment, using accounting measures of net income. The formula for the accounting rate of return is:

$$\text{ARR} = \frac{\text{Annual revenue from project} - \text{Annual exp. of project}}{\text{Project investment}} \times 100$$

This rate is compared with the rate expected on other projects, had the same funds been invested alternatively in those projects. Sometimes, the management compares this rate with the minimum rate (called cut of rate) they may have in mind.

Notes

Merits: This method is quite simple and popular because it is easy to understand and includes income from the project throughout its life.

Limitations

1. This method ignores the timing of cash flows, the duration of cash flows and the time value of money.
2. It is based upon a crude average of profits of the future years. It ignores the effect of fluctuations in profits from year to year.

Conclusion

The traditional techniques of appraising capital investment decision have two major drawbacks:

1. They do not consider total benefits throughout the life of the project and
2. Timing of cash inflows is not considered.

Hence, two essential ingredients of a theoretically sound appraisal method are that:

1. It should be based on total cash stream through the project life and
2. It should consider the time value of money of cash flows in each period of a projects life.



Did u know? The discounted cash flows techniques also known as time adjusted techniques satisfy these requirements and provide a more objective basis for selecting and evaluating investment projects.

6.3.2 Discounted Cash Flow Methods

Discounted cash flow refers to the fact that all projected cash inflows and outflows for a capital budgeting project are discounted to their present value using an approximate interest rate. Three discounted cash flow methods are generally used in capital budgeting. One is called Net Present Value Method (NPV); the other is called Profitability Index or Desirability factor and the third Internal Rate of Return (lRR). All the three methods focus on the timing of cash flows over the entire life of the project. The spotlight is on the cash flows as opposed to accounting measures of revenue and expense.

All discounted cash flow methods are based on the time value of money, which means that an amount of money received now is worth more than an equal amount of money received in future. Money in hand can be invested to earn a return.

To simplify the process of evaluating proposals using discounted cash flows, the assumption is often made that cash flow or cash savings from a project occur at the end of accounting period since the results are not materially different from mere precise calculations.

Net Present Value (NPV)

Under this method, all cash inflows and outflow are discounted at a minimum acceptable rate of return, usually the firm's cost of capital. If the present value of the cash inflows is greater than the present value of the cash outflows, the project is acceptable i.e., NPV > 0, accept and NPV < 0, reject. In other words, a positive NPV means the project earns a rate of return higher than the firm's cost of capital.

Notes



Example: JP Company wants to buy a machine with a cost of ₹ 33,522 and annual cash savings of ₹ 10,000 for each of 5 years. JP Company's cost of capital is 12%. With uniform cash flows, the present value (PV) is computed using the present value of and annuity of 5 payments of ₹ 10,000 each at 12%, the NPV is calculated as follows:

PV of Cash inflows = 10,000 × 3,605 (PV 1 - 5 years @ 12%)	₹ 36,050
Less: Present Value of Cash outflows	33,522
Net present value of the project	2,528

Since NPV is positive, the project is acceptable since the net value of earnings exceeds by ₹ 2,528 the amount paid for the use of the funds to finance the investment.

The net present value relies on the time value of money and the timings of cash flows in evaluating projects. All cash flows are discounted at the cost of capital and NPV assumes that all cash inflows from projects are reinvested at the cost of capital.

As a decision criterion, this method can be used to make a choice between mutually exclusive projects. The project with the highest NPV would be assigned the first rank, followed by others in the descending order.

Merits

1. It recognises the time value of money.
2. The whole stream of cash flows throughout the project life is considered.
3. A changing discount rate can be built into the NPV calculations by altering the denominator.
4. NPV can be seen as the addition to the wealth of shareholders. The criterion of NPV is, thus, in conformity with basic financial objectives.
5. This method is useful for selection of mutually exclusive projects.
6. An NPV uses the discounted cash flows i.e., expresses cash flows in terms of current rupees. The NPV's of different projects therefore, can be added/compared. This is called the value additive principle, implying that NPV's of separate projects can be added. It implies that each project can be evaluated independent of others on its own merit.

Limitations

1. It is difficult to calculate as well as understand and use in comparison with the payback method or even the ARR method.
2. The calculation of discount rate presents serious problems. In fact, there is difference of opinion even regarding the exact method of calculating it.
3. PV method is an absolute measure. *Prima facie* between the two projects, this method will favour the project, which has Higher Present Value (or NPV). But it is likely that this project may also involve a larger initial outlay. Thus, in case of projects involving different outlays, the present value method may not give dependable results.
4. This method may not give satisfactory results in case of projects having different effective lives.

Desirability Factor/Profitability Index (PI)

NPV of a project is a function of the discount rate, the timings of the cash flow and the size of the cash flows. Other things being equal, large investment proposals yield larger net present values.

Notes

Logic tells, cash flows of the larger machine are merely a multiple of cash flows of the smaller machines. To adjust, the size of the cash flows, we can calculate a profitability index, which is the ratio of the present value of cash inflows to the present value of the cash outflows. Thus, profitability index

$$(PI) = \frac{\text{P.V. of cash inflow}}{\text{P.V. of cash outflows}}$$

The higher the PI, the more desirable the project in terms of return per rupees of investment. A PI of I.O. is the cut-off point for accepting projects and is equivalent to being NPV positive. A PI of less than 1.0 indicates negative net present value for the project.

Internal Rate of Return (IRR)

Internal rate of return is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows i.e., at that interest rate the net present value equals zero.

The discount rate i.e., cost of capital is considered in determination of the net present value while in the internal rate of return calculation, the net present value is set equal to zero and the discount rate which satisfies this condition is determined and is called Internal Rate of Return.

Any investment that yields a rate of return greater than the cost of capital should be accepted because the project will increase the value of the firm.



Did u know? Unlike, the NPV method, calculating the value of IRR is more difficult. The procedure depends on whether the cash flows are annuity (equal year wise) or non-uniform.

The following steps are taken in determining IRR for an annuity (equal cash flows):

1. Determine the payback period of the proposed investment.
2. From the table of Present value of Annuity, look for year that is equal to or closer to the life of the project.
3. From the year column, find two Present Value or discount factors closest to payback period, one larger and other smaller than it.
4. From the top row of the table note, the two interest rates corresponding to these Present values as in (3) above.
5. Determine IRR by interpolation.

When cash flows are not uniform, an interest rate cannot be found using annuity tables.

Instead trial and error methods or a computer can be used to find the IRR. If the IRR is computed manually, the first step is to select an interest rate that seems reasonable (this can be done by calculating average annual cash flows by the annuity method as mentioned earlier) and then compute the present value of the individual cash flows using that rate.

If the net present value is positive, then the interest rate used is low, i.e., IRR is higher than the interest rate selected. A higher interest rate is then chosen and the present value of the cash flows is computed again. If the new interest rates yield a negative net present value, then a lower interest rate is to be selected. The process is repeated until the present value of cash inflow is equal to the present value of the cash outflows. Finding the rate of return using trial and error methods can be tedious, but a computer can accomplish the task quite easily.

Notes

Advantages

1. It possesses the advantages, which are offered by the NPV criterion such as it considers time value of money, and takes into account the total cash inflows and outflows.
2. IRR is easier to understand. Business executives and non-technical people understand the concept of IRR much more readily that they understand the concepts of NPV.
3. It does not use the concept of the required cost of return (or the cost of capital). It itself provides a rate of return which is indicative of the profitability of the proposal. The cost of capital enters the calculation, later on.
4. It is consistent with the overall objective of maximizing shareholders wealth since the acceptance or otherwise of a project is based on comparison of the IRR with the required rate of return.

Limitations

1. It involves tedious calculations.
2. It produces multiple rates, which can be confusing.
3. In evaluating mutually exclusive proposals, the project with the highest IRR would be picked up to the exclusion of all others. However, in practice, it may not turn out to be one that is the most profitable and consistent with the objectives of the firm i.e., maximization of the wealth of the shareholders.
4. Under IRR method, it is assumed that, all intermediate cash flows are reinvested at the IRR rate. It is not logical to think that the same firm has the ability to reinvest, the cash flows at different rates. In order to have correct and reliable results it is obvious, therefore, that they should be based on realistic estimates of the interest rate at which the income will be reinvested.
5. The IRR rule requires comparing the projects IRR with the opportunity cost of capital. But, sometimes, there is an opportunity cost of capital for 1 year cash flows, a different cost of capital for 2-year cash flows and so on. In these cases, there is no simple yardstick for evaluating the IRR of a project.

Self Assessment

Fill in the blanks:

5. Under Net Present Value (NPV) method, all cash inflows and outflow are discounted at a …… acceptable rate of return, usually the firm's cost of capital.
6. …… is the ratio of the present value of cash inflows to the present value of the cash outflows.
7. …… is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows.

6.4 Comparison – NPV and IRR Methods

Similarities: In respect of conventional and independent projects, the two methods give a concurrent acceptance-reject decision. In case of conventional investment cash outflows are

Notes

confined to the initial period (i.e. in the beginning) followed by cash inflows. The independent proposals refer to investment, the acceptance of which does not preclude the acceptance of others, so that all profitable proposals can be accepted and there are no constraints. The decision rule is that a proposal will be accepted if

1. NPV exceeds zero,
2. IRR exceeds the required rate of return.

Similarly, when NPV = Zero or the IRR = required rate of return, the project may be accepted or rejected.

Differences: In case of mutually exclusive capital project i.e., the acceptance of an investment precludes the acceptance of others (i.e. if there are alternative courses of action, only one can be accepted). Mutual exclusiveness of the investment projects may be technical or financial. Technical means projects with different profitabilities and selection of the more profitable. Financial means resource constraints, which is also called capital rationing.

The different ranking by NPV and IRR methods can be due to the following:

1. Size disparity
2. Time disparity
3. Unequal expected lives.

As stated earlier, the IRR criterion implicitly assumes that the cash flow generated by the project will be reinvested at the internal rate of return, as opposed to company's cost of capital in case of NPV. The assumption of the NPV method is considered to be superior since the rate can be consistently applied to all investment proposals.

6.4.1 Net Present Value vs Profitability Index

The investment proposal will be acceptable if:

1. PI is greater than one.
2. Positive Net Present Value.

Likewise, PI will be less than I when the investment proposal has a negative net present value under the NPV method.



Caution While evaluating mutually exclusive investment proposals, these methods will give different rankings. The best project is the one, which adds the most, among available alternatives, to the shareholders wealth. The NPV method by its very definition, will always select such projects.

6.4.2 Interrelation between Payback, Net Present Value, IRR and Profitability Index

We have seen

$$\text{Payback period} = \frac{\text{Cost of the Project}}{\text{Annual cost saving / Inflows}}$$

Notes

We have also seen that investment proposal will be acceptable if PI is greater than one and Net Present Value is positive.

Again, NPV = 0, when the discount rate is equal to cost of capital and PI = I and by definition IRR is the interest rate that discounts an investments', future cash flows to the present so that present value of inflows equals to the present value of cash outflows i.e., NPV is equal to zero. Hence, under IRR, if interest rate is equal to cost of capital, NPV is zero and also PI = I.

The steps for determining IRR for an annuity (equal annual cash flows).

1. Payback period, which will give the cumulative present value factor.
2. From cumulative PV (discount) factor tables see the corresponding interest rate nearest to that figure corresponding to the life of the project (No. of years).

From the above discussion we can conclude the following:

1. Payback period = Cumulative Present value of Discount, based.
   (equal annual cash flows) on cost of capital.
2. At IRR rate of interest NPV = 0 i.e., Cost of the project = Cash outflows
   = Present value of cash inflows
   = Annual cash inflows × Cumulative discount factor
   (In case of equal annual cash inflows)



Example: Following are the data on a capital project being evaluated by the management of X Ltd.

	Project M
Annual cost saving	₹ 40,000
Useful life	4 years
IRR	15%
Profitability Index (PI)	1.064
NPV	?
Cost of capital	?
Cost of project	?
Payback	?
Salvage value	0
Find the missing values.	(Given cumulative PV 1-4 years @ 15% = 2.855)

Solution:

At 15% IRR, the sum total of cash inflows = Initial cash outlay i.e. cost of the project

Cumulative present value @ 15% for 4 years = 2.855 and Annual Cost saving ₹ 40,000

Hence, Total of Cash inflows = 40,000 × 2.855 = ₹ 1,14,200

Therefore, Initial Cost Outlay

i.e., Cost of the project = ₹ 1,14,200

Notes

$$\text{Payback period} = \frac{\text{Cost of the project}}{\text{Annual cost saving}} = \frac{1,14,200}{40,000} = 2.855 \text{ years}$$

= 2 years 11 months

P I. = 1.064

$$= \frac{\text{P.V. of cash inflows}}{\text{P.V. of cash outflows i.e. Cost of the project}}$$

Hence, PV of Cash inflows = 1.064 × 1,14,200 = ₹ 1,21,508.8

NPV = 1,21,508.8 – 1,14,200 = ₹ 7,309

Current Present Value factor at Company's Cost of Capital

$$= \frac{\text{PV of Cash inflows}}{\text{Annual Cost Saving}}$$

= 3.0377

From the present value table corresponding to 4 years the discount/interest is 12%

i.e., Cost of capital = 12%.

Example: Following are the data on a capital project with equal annual cash savings evaluated by the management of S company -

	Project
Cost	₹ 1,01,400
Payback	5.07 years
Annual Cost Saving	?
Useful life	?
Cost of Capital	?
NPV -	?
IRR	19 per cent
PI	1.14
Salvage Value	0

Find the missing values.

Solution:

1. Annual Cost Saving = Cost of Project/Payback period

   = ₹ 1,01,400/5.07 = ₹ 20,000

2. At IRR rate of discount (i.e. 19%)

   Cost of the project = PV of cash inflows

   = ₹ 1,01,400

Notes

Hence, Cumulative Present Value at 19%

$$= \frac{1,01,400}{20,000} = 5.07$$

If we refer to Cumulative Present Value @19% Cumulative Present Value of 5.07 is computed at 19 years. Therefore, useful life =19 years.

3. PI = 1.14 at cost of capital rate of interest; at IRR rate of discount

   PI index = 1. Hence Cumulative Present Value at cost of capital rate of interest = 5.07 × 1.14 = 5.778. By referring to Cumulative Present Value table up to 19 years. We find at 17% Cumulative Present Value 5,585 and at 16% = 5.877. Since 5,778 Cumulative Present value is lying between 5.877 and 5,585 by interpolation we get,

   16 + = 16 + = 34 + 16 = 16.34%

4. NPV at IRR rate of discount = 0 when PI = I

   Since PI = 1.14

   Therefore, NPV = 0.14 × Cost of the project = 0.14 × 1,01,400 = ₹ 1, 41,196

6.4.3 Concept of Project IRR

In spite of the theoretical superiority of NPV, financial managers prefer to use IRR. The preference for IRR is due to the general preference of business people towards rates of return rather than actual rupee returns. Because interest rates, profitability and so on are most often expressed as annual rates of return, the use of IRR makes sense to financial decision makers. They tend to find NPV less intuitive because it does not measure benefits relative to amount invested. The concept of project IRR finds favour material financial undertakings and other providers of capital. It gives an idea of how much discounting towards amount of capital, the project can sustain during its life span. This can be explained through an example.



Example: XYZ Ltd. an infrastructural company is evaluating a proposal to build, operate and transfer a section of 35 km of road at a project cost of ₹ 200 crores to be financed as:

Equity share capital	₹ 50 crores
Loans at the rate of interest of 15% from financial institutions	₹ 150 crores

The project after completion must be opened to the traffic and must be affected for a period of 15 years and after 15 years, it must be handed over to the highway authorities at zero value. It is estimated that the total revenue must be ₹ 50 crore per annum and annual collection expenses including maintenance of roads will amount to 5% of the project cost. The company considers to write off the total cost of the project in 15 years in a straight line basis for corporate income tax, the company is allowed to take depreciation @ 10% on NDV basis. The financial institutions are agreeable to the repayment of the loan in 15 equal annual installments - consisting of principal and interest.

Calculate Project IRR and Equity IRR. Ignore corporate taxation. Explain the difference in project IRR and equity IRR.

Solution:

The project cash inflows and cash outflows can be summarized as follows:

Notes

Cash outflow / Cost of the project	0	1	2	3 - 15
	200			
Cash inflow / Revenue for Tax			50	
Less maintenance 5% of 200				
Net.			10	
			40	40 – 15 years

At IRR - Cost of the project equal to discounted cash inflows of ₹ 40 crores for total project life i.e., 15 years.

Now, cost of the project = ₹ 200 crores.

Hence, 200 crores = cum discount factor 1 - 15 years × ₹ 40 crores or cum discount factor 1-15 years $= \frac{200}{40}$ = from the rate of present value of annuity, it will be observed that at 20% cum present value 1-15 years 5.09158 at 19% cum present value 1-15 years 4.87586. Hence Project IRR will be between 19% and 20%, it will be approximately 19% + $\frac{5 - 4.87586}{5.09158 - 4.87568}$ i.e. $\frac{0.12414}{0.21572}$ = 19 + 0.58%

Since, there is no corporate taxation, depreciation will not affect cash flow, hence depreciation; has not been considered. Now the project is financed by ₹ 50 crores debt @ 15% p.a. i.e., yearly interest of ₹ 7.50 crore and equity capital ₹ 150 crores. Hence profit available to equity shareholders each year

= Net cash inflow – Interest outflow

= ₹ 40 – ₹ 7.5 = ₹ 32.5 crores.

Hence, cum discount factor for equity shares = $\frac{150}{325}$ = 4.61538

If we see the present value of annuity table 1-15 years cumulative, we find

20% = 4.67547

21% = 4.48901 Hence it will be between 20 & 21%

It will be

$$20\% + \frac{4.61538 - 4.48901}{4.67547 - 4.48901} \text{ i.e. } \frac{0.12607}{0.18646} = 20.68\%$$

Equity IRR is more than project IRR, since the project is earning 19.58% on discounted basis, interest is being paid @ 15% so capital is contributed by debt is interest paid is less than the interest earned, the balance goes to equity share holders to increase their return.

6.4.4 Capital Rationing

The process of selecting the more desirable projects among many profitable investments is called capital rationing. Like any rationing it is designed to maximize the benefit available from using scarce resources. In this case the scarce resources are funds available for capital investments

Notes

and the benefits are returns on the investments. The objective is to select the combination of projects, which would give maximization of the total NPV. The project selection under capital rationing involves two stages:

1. The identification of the acceptable projects,
2. To select the combination, of projects. The acceptability of projects can be based either on profitability/present value index or IRR.



Notes Many firms' capital constraints are 'Soft'. They reflect no imperfections in capital markets. Instead they are provisional limits adapted by management as an aid to financial control. Soft rationing should never cost the firm anything. If capital constraints become tight enough to hurt in the sense that projects with significant positive NPV's are passed up then the firm raises more money and loosens the constraint. But when it can't raise more money, then it faces hard rationing. 'Hard' capital rationing always reflects on market imperfection a barrier between the firm and capital markets, which can be attributed to non-availability of market information, investor attitude etc.

There are various ways of resorting to capital rationing. For instance, a firm may effect capital rationing through budgets. Capital rationing may also be exercised by following the concept of "responsibility accounting", whereby management may introduce capital rationing by authorizing a particular department to make investment only up to a specified limit, beyond which the investment decisions are to be taken up by higher-ups.

In capital rationing, it may also be more desirable to accept small investment proposals than a few large investment proposals so that there may be full utilization of budgeted amount. This may result in accepting relatively less profitable investment proposals if full utilization of budget is a primary consideration.

Similarly, capital rationing may also mean that the firm foregoes the next most profitable investment following after the budget ceiling, even though it is estimated to yield a rate of return much higher than the required rate of return. Thus, capital rationing does not always lead to optimum results.



Example: S. Ltd. has ₹ 10,00,000 allocated for capital budgeting purposes. The following proposals and associated profitability indexes have been determined:

Project (₹)	Amount	Profitability Index
1	3,00,0.00	1.22
2	1,50,000	0.95
3	3,50,000	1.20
4	4,50,000	1.18
5	2,00,000	1.20
6	4,00,000	1.05

Which of the above investments should be undertaken? Assume that projects are indivisible and there is no alternative use of the money allocated for capital budgeting:

Notes

Solution:

We should go in for projects priority-wise based on PI Index:

Project	PI	Investment ₹	Priority	Sum Total of Cash Inflows ₹	NPV ₹
1	1.22	3,00,000	I	3,66,000	66,000
3	1.20	3,50,000	2	4,20,000	70,000
5	1.20	2,00,000	2	2,40,000	40,000
4	1.18	4,50,000	3	5,31,000	81,000
6	1.05	4,00,000	4	4,20,000	20,000

Since there is no alternative use of money we should maximize capital spending provided project is profitable, that is, PI is more than I and NPV is positive. Combination of project 1, 3, 5 gives NPV of ₹ 1,76,000 but ₹ 1,50,000 remains unspent, whereas combination of 3, 4, 5 gives NPV of ₹ 1,91,000 and every amount is spent. Hence project 3, 4, 5 are to be taken.

6.4.5 Break-Even Time and Capital Budgeting for New Products

Time is being considered as a competitive weapon specifically for firms that bring a new product to market at a very fast rate in order to gain sizeable shares of total market sales for that product. Hence, the increased emphasis to the use of break-even time as a capital budgeting method and as a performance measures.

Break-Even Time (BET) is the time taken from the start of the project (the initial idea date) till the period the Cumulative Present Value of cash inflows of a project equal to present values of the total cash outflows. Hence, product proposals with shorter BET's are preferred to longer BETs if all other things are equal.

BET also promotes aggressive efforts by personnel on different functional areas such as product design and manufacturing to speed up the time taken to bring the product to the market and reap the benefits fast.



Did u know? Hewlett-Packard is a strong advocate of BET.



Example: Two products A and B are being evaluated by a Computer Manufacturing Company. The estimated cash outflows covering research and development, product design, manufacturing, marketing, distribution and customer services and cash inflows from sales are given below:

(₹ lakhs)

	Product A		Product B	
Year	Cash Outflows	Cash Inflows	Cash Outflows	Cash Inflows
1	8	0	10	4
2	6	14	7	32
3	22	34	17	26
4	13	37	6	8
5	10	22	0	2

Notes

The company uses a 14% required rate of return for discounting cash flows on a before tax basis.

Solution:

(₹ lakhs)

Year	PV Factor	Cash Outflows	PV of Cash Outflows	Cum PV of Cash Outflows	Cash Inflows	PV of Cash Inflows	Cum. PV of Cash Inflows
A							
1	0.877	8	7.016	7.016	0	-	0
2	0.769	6	4.614	11.63	14	10.766	10.766
3	0.675	22	14.85	26.48	34	22.95	33.716
4	0.592	13	7.696	34.176	37	21.904	55.62
5	0.519	10	5.19	39.366	22	11.418	67.038

Year	PV Factor	Cash Outflows	PV of Cash Outflows	Cum PV of Cash Outflows	Cash Inflows	PV of Cash Inflows	Cum. PV of Cash Inflows
B							
1	0.877	10	8.77	8.77	4	3.508	3.508
2	0.769	7	5.383	14.153	32	24.608	28.116
3	0.675	17	11.475	25.628	26	17.55	45.666
4	0.592	6	3.552	29.18	8	4.736	50.402
5	0.519	0	0	29.18	2	1.038	51.44

For Product B, the present values of the total cash outflows are ₹ 29.181akh. At the end of 2 year, the cumulative present value of cash inflows is ₹ 28,116 lakhs and for 3rd year the present value of cash inflows is 17.550.

$$\text{BET for Product B} = \frac{29.18 - 28.116}{17.550} = 2.06 \text{ years}$$

For Product A, the present value of total cash outflows is ₹ 39.366 lakhs. At the end of 3 year, the cumulative present value of cash inflows is ₹ 33.716 lakhs and for 4th year the present value of cash inflows is ₹ 21.904 lakhs.

$$\text{BET of Product A} = 3 + \frac{39.366 - 33.716}{21.904} = 3.26 \text{ years}$$

6.4.6 BET versus the Payback Method

Differences

1. BET starts counting time at the start of the project, irrespective of when the cash outflows occur whereas payback method starts counting time from the initial cash outflow.
2. BET takes account of time value of money when cumulating cash inflows and cash outflows, whereas payback method ignores the time value of money.

Similarity

1. Both methods ignore cash inflows after the break-even time or the payback period.

Notes

Self Assessment

Fill in the blanks:

8. Profitability Index will be less than I when the investment proposal has a …… net present value under the NPV method.
9. 'The process of selecting the more desirable projects among many profitable investments is called …… .

6.5 Financial Data for Sample Problem

From the following, calculate differential cash flow streams considering that a firm has an existing machine and is considering the purchase of a new machine:

1. The new machine is more efficient than the existing machine. This will increase the firm's revenue from products made by the machine from ₹ 4,00,000 to ₹ 4,50,000 and will lower operating cost from ₹ 2,10,000 to ₹ 1,70,000.
2. The new machine will cost ₹ 2,20,000. It will cost ₹ 20,000 for transportation and installation of machine. The firm will receive ₹ 15,000 investment tax credit as a result of the purchases and installation of the machine.
3. The new machine will have a service life of 4 years. The existing machine will also be able to produce goods for four more years.
4. The new machine processes raw materials more quickly and works more efficiently on long production runs. Thus, the firm must tie up an additional ₹ 20,000 of goods in inventories to support the new machine.
5. At the present time, the book value of the existing machine is ₹ 80,000 and it is being depreciated at ₹ 20,000 per year, to a zero book value. If the existing machine is sold today, its cash value would be ₹ 40,000. If it continues to operate for 4 more years, its cash value would be ₹ 10,000.
6. The new machine will be depreciated using straight-line depreciation. In four years, it will have ₹ 40,000 book value and ₹ 30,000 cash salvage value. Take Income Tax @ 50%.

Step 1 - Calculate the Net Cash Outlay: The net cash outlay is the different amount of money that will be spent when the investment is made in year zero. It may be calculated by = Total cost of new investment including purchase price, transportation, installation and any related charges. Tax savings from investment tax credit +/- changes in the working capital requirements net cash received from replacing existing machines (i.e., selling price or money received less any costs of removing the asset) +/- either the taxes saved or additional taxes to be paid as a result of purchasing the new asset. In our example, ₹ 2,20,000 is the purchase price plus ₹ 20,000 for transportation and installation.

The investment tax credit produces a tax saving of ₹ 15,000. The working capital tied up is ₹ 20,000 that is treated as an outlay in year zero. It will be an inflow in year 4. The cash for the existing machine is ₹ 40,000. The tax effect is a saving that occurs because the firm sells a ₹ 6,80,000 book value machine for ₹ 40,000, procuring non-cash or book loss. At a 50 per cent tax rate, the loss of ₹ 40, 000 in the sale produces a ₹ 20,000 tax savings. Thus, net cash outlay (outflow) is

2,20,000 + 20,000 – 15,000 + 20,000 – 40,000 – 20,000 = ₹ 1,85,000.

Step 2 - Calculate the Depreciation Schedules: In practice, we use the method employed by the firm for tax purposes since only this method affects the tax shield and cash flow using straight

Notes

line depreciation. In our example, the depreciation can be calculated with two formulas as follows:

Depreciable Cost = Total Cost of machine – Book salvage value

2,40,000 – 40,000 = ₹ 2,00,000

Annual Depreciation = Depreciable Cost/Years of life

= 2,00,000/4 = ₹ 50,000

With the straight-line method, ₹ 50,000 depreciation is the same for each of the four years of the new machines estimated service life. With other methods, the amount of depreciation differs each year.

The depreciation on the existing machine is given at ₹ 20,000 per year down to zero book value. Since the current book value is ₹ 80,000, the annual depreciation of ₹ 20,000 will be realised for the remaining four years of service life.

Step 3 - Calculate Annual after Tax Cash flows: In our example, the annual cash flows will be same each year since the revenues, costs, depreciation and taxes do not change. To compute after tax cash flows from operations or employment of the asset there are 2 methods:

1. We begin with revenues, deduct cash expenses and taxes, and we have the cash flow, or
2. We can begin with revenues; deduct cash expenses, and non-cash expenses. Calculate taxes and deduct them and then add back depreciation. The two methods are shown below:

	New Machine		Existing Machine	
	Accounting	**Cash flow**	**Accounting**	**Cash flow**
Annual-revenues	450,000	400,900	400,000	400,000
Less: Annual cost of operation	170,000	210,000	210,000	210,000
Before tax cash flow	280,000	190,000	190,000	190,000
Less: annual depreciation	50,000	20,000	20,000	20,000
	230,000	170,000	170,000	170,000
Less: income taxes 50%	115,000		85,000	85,000
Net income after taxes	115,000	85,000	85,000	85,000
Add: Back Depreciation	50,000	20,000	20,000	20,000
After tax cash flow	165,000	105,000	105,000	105,000

Notes Any tax shield from interest payments on debt is omitted, since the effects off financing by different methods are considered in cost of capital calculation and are not covered in capital budgeting so as to avoid double counting of financing effects.

Step 4 - Calculate effects in final year:

In the final year two events occur:

1. The return of the working capital tied up in year zero. In our example, ₹ 20,000 is treated as an inflow in the final year since the money is freed for other uses.

Notes

2. In the final year, each machine is sold in its respective cash flow stream. To get the after tax effect, we must estimate the book and cash value and compute the net cash value from the sale of each asset, as given below:

	New Machine	Existing Machine
Book value in 4 years	40,000	0
Cash value in 4 years	30,000	10,000
Gain (Loss) on sale in 4 years	(10,000)	10,000
Tax saving (additional taxes)	5,000	(5,000)
Plus Cash Received	30,000	10,000
Net Cash Value	35,000	5,000

Thus, we have cash flow in the final year as follows:

	New Machine	Existing Machine
Annual inflows from step 3	1,65,000	1,05,000
Return of working capital	20,000	-
Sale of machine	35,000	5,000
Final year cash flow	2,20.000	1,10.000

Step 5 - Calculate the Differential after Tax stream: We subtract the existing machine stream from the new machine stream as follows:

Year	New Machine	Existing Machine	Difference
0	(1,85,000)	0	(1,85,000)
1	1,65,000	1,05,000	60,000
2	1,65,000	1,05,000	60,000
3	1,65,000	1,05,000	60,000
4	2,20,000	1,10,000	1,10,000

This stream shows both the timing and amount of net cash outlay and net cash inflow over the life of the new machine. All effects are differential - the difference between having the investment and not having it, and can be evaluated with time-value of money techniques as have been discussed earlier.

Cost of capital: As mentioned above, the cost of capital is an important element as basic input information in capital investment decisions. It provides a yard stick to measure the work of investment proposals and thus, perform the role of accept reject criterion. It is also referred to a cut-off-rate, target rate, minimum required rate of return, standard return and so on. In the present value method of discounted cash flow techniques, the cost of capital is used as the discount rate to calculate the NPV.



Notes The PI Index or benefit cost ratio method similarly employs to determine the present value of future cash inflows. In case of internal rate of return method, the computed IRR is compared with the cost of capital, and accept only the cases where they are more than cost of capital.

In operational terms, cost of capital refers to the discount rate that would be used in determining the present values of estimated future cash proceeds and eventually deciding whether the project is worth accepting or not.

Notes

The cost of capital is considered as consisting of different sources of funds. The cost of each source is called as specific cost of capital and these specific costs when combined refer to overall cost of capital or weighted cost of capital.

Assumptions – Cost of Capital

1. That the firm's business and financial risk are unaffected by the acceptance and financing of projects.
2. The firm's financial structure is assumed to remain fixed. It implies that the additional funds required to finance the new project are to be raised in the same proportion as the firm's existing financing.

Practice Problems

Problem 1: A project costing ₹ 5,60,000 is expected to produce annual net cash benefits of ₹ 80,000 over a period of 15 years. Estimate the IRR. Also, find the payback period and obtain the IRR from it. How do you compare this IRR with the one directly estimated?

Solution:

$$\text{Payback period} = ₹\frac{5,60,000}{80,000} = 7$$

Hence from the present value of annuity 1 – 15 years closest factors to 7 are 7.191, (at 11% rate of discount) and 6.811 (at 12% rate of discount). Hence IRR would be somewhere between 11% and 12%.

Using interpolation IRR would be:

$$11\% + \frac{7.191 - 7}{7.191 - 6.811} = 11\% + \frac{0.191}{0.380} = 11.5\%$$

We know that reciprocal of payback period is a good approximation of the IRR provided the life of the project is large or at least twice the payback period and the project generates equal annual cash inflows. Since both the conditions are satisfied. IRR would be reciprocal of the payback period i.e., 1/7 = 14.28%.

The two IRR's are different. The second method is an approximation present value whereas the first gives the correct IRR, since at that discount rate cash inflows equals the cost of the project or the net present value is zero.

Problem 2: Valuable Products are considering purchase of a machine for its production line. Two types of options are available deluxe model with ₹ 30,000 initial cost and economy model with ₹ 20,000 initial cost. Each model has 5 years life and no salvage value. The net cash flows after taxes associated with each investment proposal are:

	Deluxe Model	**Economy Model**
Net cash flows after taxes 1-5 years	₹ 9,000	₹ 6,000

Notes

Solution:

1. *Nest Present Value Method:*

			Cash inflow after taxes		Total Present Value
Year's	**Deluxe Model**	**Economy Model**	**PV Factor**	**Deluxe Model**	**Economic Model**
	₹	**₹**	**10%**	**₹**	**₹**
1 - 5	9,000	6,000	3.7907	34,116	22,744
		Deduct initial cost		30.000	20.000
		Net Present Value		4,116	2,744

Hence, the model that gives higher NPV should be chosen i.e. Deluxe Model.

Remark: Since capital outlay was higher for Deluxe Model it has given higher NPV.

2. ***Present Value Index:***

	Deluxe Model	**Economy Model**
	34,116	22,744
	30,000	20,000
=	1.1372	1.1372

Since both give same PI Index, we are indifferent as to both the models.

3. ***IRR:***

Deluxe Model	**Economy Model**
30,000	20,000
9,000	6,000
= 3.33 years	= 3.33 years

Decision: If the capital is adequate there are no constraints, the proposal that gives higher NPV should be selected. In this case, the Deluxe Model.

Problem 3: The High Peaks Sporting Goods Stores have been plagued by numerous burglaries over the last 3 years. To keep insurance premiums at reasonable level and protect ₹ 10,00,000 inventory, the store fixed a night watchman. The watchman has solved the burglary problem, but he costs the firm ₹ 12,000 a year.

He is occasionally absent from work due to sickness or bad weather. A security system company has offered to sell the store system that would eliminate the need for the night watchman. The system has an expected useful life of 15 years. The security system's salesperson is computing the cost of the system and will present a bid this week. The management estimates cost of capital at 16%.

Required:

1. What is the maximum bid the store should accept?
2. If the bid is ₹ 64,000 should the store accept?
3. If the actual life of the security system is 12 years instead of 15, does it have any effect on your answer in part (b)?

Notes

Solution:

In this case there are two alternatives:

1. To employ watchman at a salary of ₹ 12,000 a year.
2. To buy the system that has an expected life of 15 years.

If one buys the system it will save ₹ 12,000 per year for 15 years i.e., at zero date it is equivalent to 12,000 × Cum Discount factor at 16% for 1 - 15 years = 12,000 × 5.575 = ₹ 66,900. Hence the maximum bid the store should accept is ₹ 66,900. Any offer less than 66,900 is acceptable hence if the bid is ₹ 64,000 the store should accept.

If the actual life of the security system is 12 years, the saving is equivalent to 12,000 × Discount factors at 16% 1 - 12 years = 12,000 × 5,197 = ₹ 62,364. Hence the maximum should be restricted to ₹ 62.364 in this case. Therefore, the offer of ₹ 64,000 cannot be accepted in a situation where the life of security is 12 years.

Problem 4: A company owns a machine, which is in current use. It was purchased at ₹ 1,60,000 and had a projected life of 15 years with ₹ 10,000 salvage value. It has a depreciated straight line for 5 years to date and could be sold for ₹ 1,30,000.

A new machine can be purchased at a total cost of ₹ 2,60,000 have a 10-year life salvage value of ₹ 10,000 and will be depreciated straight line. It is estimated that the new machine will reduce labour expenses of ₹ 15,000 per year and net working capital requirement of ₹ 20,000. The income tax rate applicable to the company is 40% and its required rate is 12% on investment. Determine whether the new machine should be purchased. The income statement of the firm using the current machine for the current year is as follows:

Sales		₹ 20,00,000
Labour	7,00,000	
Material	5,00,000	
Depreciation	2,00,000	14,00,000
Earnings before Tax		6,00,000
Taxation @ 40%		2,40,000
Profit after tax		3,60,000

Assume that if the sale proceeds of machine exceed the depreciated value, so much of the excess as does not exceed the difference between the costs and written down value, shall be subject to income tax. Given cumulative present value factor 1 - 10 years at 12% 5.650 and present value factor year 10 at 12% 0.322.

Solution:

	₹	₹	₹
Saving of labour expenses due to new machine			15,000
Less: Increase in depreciation on account of new machine			
Depre. on account of new machine	$\frac{2,60,000-10,000}{10}$	25,000	
Depre. on account of existing machine	$\frac{1,60,000-10,000}{15}$	10,000	15,000
Net increase in profits			0
Add depreciation added back		15,000	

Notes

Incremental cash inflow per year		15,000
Capital investment:		
Cost of the new machine	2,60,000	
Sale proceeds of old machine	(–) 1,30,000	
Tax on account of sale of old machine:		
Sale proceeds	1,30,000	
Depreciated value 160,000 – 5 × 10,000	1,10,000	
40% tax	20,000	8,000
Reduction in Working Capital	(–) 20,000	118,000
Inflow:		
Saving from operations 1 - 10 years @ ₹ 15,000 × 5,650	84,750	
Sale proceeds at 10th year 10,000 × 0.322	3,220	
Reduction in working capital		
restored at the end of the project 20,000 × 0.322	(–) 6.440	81,530
Net Present Value		(-) 36,470

Since the net present value is negative, the new machine should not be purchased.

Problem 5: A company is setting up a project at a cost of ₹ 300 lakhs. It has to decide whether to locate the plant in a Forward Area (FA) or Backward Area (BA). Locating in Backward area means a cash subsidy of ₹ 15 lakhs from the Central Govt. Besides, the taxable profits to the extent of 20% is exempt for 10 years. The project envisages a borrowing of ₹ 200 lakhs in either case.

The cost of borrowing will be 12% in Forward Area and 10% in Backward Area; costs are bound to be higher in Backward Area. However, the revenue costs are bound to be higher in Backward Area. The borrowings (principal) have to be repaid in 4 equal annual installments beginning from the end of the 4th year.

With the help of following information and by using DCF technique you are required to suggest the proper location of the project. Assume straight-line depreciation with no residual value.

Profit (Loss) before Depreciation and Interest ₹ (Lakhs)

Year	FA	BA	Present value factor @ 15%
1	–6	–50	0.87
2	34	–20	0.76
3	54	10	0.66
4	74	20	0.57
5	108	45	0.5
6	142	100	0.43
7	156	155	0.38
8	230	190	0.33
9	330	230	0.28
10	430	330	0.25

Notes

Solution: Forward Area

Year	Profit before Int.& Depre.	Depre.	Interest	Profit after Depre. & Int.	Tax	PAT	Cash inflow = PAT+ Depre	Cash outflow	Net cash	PV	Discount Value of cash flow
0								100	–100	1	–100
1	–6	30	24	–60		–60	–30		–30	.87	–26.1
2	34	30	24	–20		–20	10		10	.76	7.6
3	54	30	24				30		30	.66	19.8
4	74	30	24	20		20	50	50		.57	
5	108	30	18	60		60	90	50	40	.50	20
6	142	30	12	100	50	50	80	50	30	.43	12.9
7	156	30	6	120	60	60	90	50	40	.38	15.2
8	230	30		200	100	100	130		130	.33	42.6
9	330	30		300	150	150	180		180	.28	50.4
10	430	30		400	200	200	230		230	.25	57.5
											100

Notes Year 1 and Year 2 loss of 60 and 20 respectively and Year 4 and 5 loss adjusted against the years profit to the extent of 20 and 60 respectively.

Backward Area:

Year	Profit before Int.& Depre.	Depre.	Interest	Profit after Depre. & Int	Tax	PAT	Cash inflow = PAT+ Depre	Cash outflow	Net cash flow	PV Factor	Discount PV
0								85	–85*	1.0	–85
1	–50	30	20	–100		–100	–70		–70	.87	– 60.9
2	–20	30	20	–70		–70	–40		–40	.76	–30.4
3	10	30	20	–40		–40	–10		–10	.66	–6.6
4	20	30	20	–30		–30		50	–50	.57	–28.5
5	45	30	15				30	50	–20	.50	–10.0
6	100	30	10	60		60	90	50	40	.43	17.2
7	155	30	5	120		120	150	50	100	.38	38
8	190	30		160	40	120	150		150	.33	49.5
9	230	30		200	80	120	150		150	.28	42.0
10	330	30		300	120	180	210		210	.25	52.5

* After adjusting cash subsidy of ₹ 15 lakhs received from the Central Government.

Notes

In the year 6 and 7, since the profits earned during the years were less than loss carried forward there was no tax liability.

In the year 8, profits of ₹ 160 lakhs were adjusted against loss c/f i.e. 100 + 70 + 40 + 30 – 60 – 120 i.e. 60 balance profit of ₹ 100 lakhs out of which 20% was tax free and the remaining 80% ₹ 80 lakhs was subject to tax @ 50% of ₹ 40 lakhs.

In the years 9 and 10, profits to the extent of 20% were tax free, balance 80% subject to tax of 50%, hence tax during the years were 200 × 0.8 × 0.5 i.e., ₹ 80 lakhs and 300 × 0.8 × 5 i.e., ₹ 120 lakhs respectively.

Decision: The net present value of the project in the Forward Area is ₹ 100.2 lakhs whereas it is negative to the extent of ₹ 22.2 lakhs in the Backward Area. Therefore, proper location of the project is the Forward Area.

Problem 6: TSL Ltd. a highly profitable and tax paying company is planning to expand its present capacity by 100%. The estimated cost of the project is ₹ 1,000 lakhs out of which ₹ 500 lakhs is to be met out of loan funds. The company has received two offers from their bankers:

	Option 1	**Option 2**
Values of loan	₹ 500 lakhs	US $ 14 lakhs equal to ₹ 500 lakhs
Interest	15% payable yearly	6% payable (fixed) yearly in US $
Period	5 years	5 years
Repayment	In 5 installments, First installment is payable 1 year after draw down?	same as Option 1
Other expenses (Average)	1 % of the value of the loan	1% of USA = ₹ 36 (Average)
Future exchange	-	End of 1 year USA = ₹ 8 thereafter rate to increase by ₹ 2 per annum.

The company is liable to pay Income tax at 35% and eligible for 25% depreciation of W.D. value. You may assume that at the end of the 5th year, the company will be able to claim balance in WDV for tax purposes. The company follows Accounting Standard AS - 11 for accounting changes in Foreign Exchange Rate.

Required:

1. Compare the total outflow of cash under the above options.
2. Using discounted cash flow technique, evaluate the above offers.
3. Is there any risk, which the company should take care of?
4. In case TSL has large volume of exports would your advice be different.

The following discounting table may be adopted:

Years	**0**	**1**	**2**	**3**	**4**	**5**
Discounting factor	1	.921	.848	.781	.720	.663

Notes

Solution:

Option I: Loan in Rupees:

Year	Repayment of Principal	Interest @ 15%	Other expenses	Tax savings	Net outflow	Discount factor	Present value
0			5	1.75	3.25	1	3.25
1	100	75		26.25	148.75	0.921	137
2	100	60		21	139	0.848	117.872
3	100	45		15.75	129.25	0.781	100.944
4	100	30		10.5	119.5	0.720	86.040
5	100	15		5.25	109.75	0.663	72.764
	500	225	5	80.5	649.5		517.87

Option II: As per AS 11, the foreign exchange difference arising out of loan repayment in foreign currency is to be capitalized. Similarly, the outstanding loan balances at each year-end have to be converted at foreign exchange rate prevailing at the end of the year and the difference has to be capitalized.

Option III: Foreign Currency Loan

Exch. Rate	Year	Repay. of Principal	Interest @ 6%	Other charges	Total amount	Repay. of Principal	Int.	Other charges	Total payments
US $ in Lakhs.						**(₹ Lakhs)**			
36	0			0.140	0.140			5.04	5.04
38	1	2.8	0.840		3.640	106.4	31.92		138.32
40	2	2.8	0.672		3.472	112	26.88		138.88
42	3	2.8	0.504		3.304	117.6	21.168		138.768
44	4	2.8	0.336		3.136	123.2	14.784		137.984
46	5	2.8	0.168		2.968	128.8	7.728		136.528
		14	**2.520**	**0.140**	**16.660**	**588**	**102.48**	**5.04**	**695.52**

Tax saving on additional depreciation on fixed assets on account of increase in loan amount at the year-end due to foreign exchange fluctuation and repayment of loan.

Year	Loan amount o/s in US $ Lakhs	Increase in loan due to foreign exchange fluctuations.	Opening WDV on addition	Total	Depreciation 25% on additions (5)	Tax savings on additions @ 35%	Closing WDV on additions
1	**2**	**3**	**4**	**5 =3 + 4**	**25% on 6**	**7**	**8 = 5-6**
1	14	32		32	8	2.8	24
2	11.2	22.4	24	46.4	11.6	4.06	34.8
3	8.4	16.8	34.8	51.6	12.9	4.515	38.7
4	5.6	11.2	38.7	49.9	12.475	4.366	37.425
5	2.8	5.6	37.425	43.025	43.025*	15.059	

* Assumed that full benefit will be claimed for tax purposes.

Notes

Year	Amt of interest and other charges	Tax saving of Int. and other charges	Tax savings on Addl. Depreciation	Total payments	Net cash outflow	Discount factor	Present value
0	5.040	1.764		5.04	3.276	1	3.276
1	31.92	11.172	2.8	138.32	124.348	.921	114.525
2	26.88	9.408	4.06	138.88	125.412	.848	106.349
3	21.168	7.408	4.515	138.768	126.845	.781	99.066
4	14.784	5.174	4.366	137.984	128.444	.720	92.480
5	7.728	2.704	15.059	136.528	118.765	.663	78.741
		37.630	30.800	695.52	727.090		494.437

1. The absolute and discounted value of Option II seems to be better than Option I. However, the company has to be careful about future exchange rate, since the indicated rates are more by rule of a thumb rather than based on any specific approach. The company should cover possible foreign exchange fluctuations in future and then work out the value.
2. In case the company has good volume of exports, then it may help the company to help in future payments. In that case, the company may take a lenient view of covering foreign exchange risk.

Problem 1: S Engineering Company is considering replacing or repairing a particular machine, which has just broken down. Last year, this machine costed ₹ 20,000 to run and maintain. These costs have been increasing in real terms in recent years with the age of the machine. A further useful life of 5 years is expected, if immediate repairs of ₹ 19,000 are carried out. If the machine is not repaired it can be sold immediately to realize actual ₹ 5,000 (ignore loss/gain on such disposal).

Alternatively, the company can buy a new machine for ₹ 49,000 with an expected life of 10 years with no salvage value after providing depreciation on straight-line basis. In this case, running and maintenance costs will reduce to ₹ 14,000 each year and are not expected to increase much in real terms for a few years at least.

S Engineering Company regards an annual return of 10% p.a. after tax as a minimum requirement on any new investment. Considering the Capital Budgeting technique, which alternative will you choose? Take corporate tax rate of 50% and assume that depreciation on straight-line basis will be accepted for tax purposes also.

Given cumulative present value of ₹ 1 p.a. @ 10% for 5 years ₹ 3,791 and for 10 years ₹ 6,145

Solution:

Repairing existing machine	₹ 9,500	
Cost of repairs is 19,000 net of tax.		
Equivalent annual cost for 5 years.	₹ 9,500 ÷ 3.791	₹ = 2506
Annual Running & Maint. cost for 10 years ₹ 20,000 net of tax.		10000
Total annual cost.		12506

Notes

Buying new machinery		
Purchase cost	₹ 49000	
Less: realization from old machine	5000	
Annual equivalent cost for 10 years	44000/6145	7160
Running & Maint. cost per machine	₹ 14000/net of tax	7000
Tax benefit of depreciation pa.	49000/10/× 50	(2450)
Total annual cost		11710
Difference in annual cost in buying		796

Since annual cost of buying is less than that of repairing, one should go for buying option.

Second solution:

1. To repair existing machine

Cost of repair immediately net of tax. (₹ 19,000 × 50%)		9,500
Running & Maint. Cost of 5 years (₹ 20,000 × 3.791)		37,910
Total net present value of after tax cash outflows for 5 years.		47,410
Hence net equivalent cash outflows p.a. 47,410/3.791		12,506

2. To buy new machine

Purchase cost of new machine	49,000	
Less: Sale proceeds of old machine	5,000	44,000
Tax benefit on depreciation p.a. (₹ 49000/10×50%)	(2,450)	
Running & Maint. Cost p.a. (50% of 14000)	7,000	
Net cash outflow for 10 years (₹ 4550×6.145)	4,550	27,960
Net cash outflows for 10 years.		71,960
Hence net equivalent cash outflows pa.	71,960/6.145	11,710

Since, net equivalent cash outflow p.a. for buying a new machine ₹ 11,710 is less than net equivalent outflows of ₹ 12,506 for repairing of an existing machine. Therefore, it is advisable that the company should go for buying a new machine.



Caution Project with Unequal Lives: Where one is considering more than one project (mutually exclusive projects) with different project lives, one should consider the equivalent annual value method. Under this method, work out the following:

1. The total net present value of after tax cash flows of each project during the project life.
2. Divide the NAV of cash flows by the annual factor corresponding to the life of the project at the given cost of capital, the result and figure in the equivalent annual net present value. (EANPV).

The decision criteria, in the case of revenue expanding proposal, is the maximization of EANPV and minimization of equivalent annual cost of in the case of cost reduction proposal. This is illustrated in example above.

Notes



Task A machine purchased 6 years ago for ₹ 1,50,000 has been depreciated to a book value of ₹ 90,000. It originally had a projected life of 15 years and zero salvage value. A new machine will cost ₹ 2,50,000 and result in a reduced operating cost of ₹ 30,000 per year for the next 9 years. The older machine could be sold for ₹ 50,000. The cost of capital is 10%. The new machine will be depreciated on a straight-line basis over 9 years life with ₹ 25,000 salvage value. The company's tax rate is 50%; determine whether the old machine should be replaced.

Self Assessment

Fill in the blanks:

10. The net cash outlay is the different amount of money that will be spent when the investment is made in year…….... .
11. The cost of capital is an important element as basic input information in ……. decisions.

6.6 Capital Decision under Risk and Uncertainty

In discussing the capital budgeting techniques, we have so far assumed that the proposed investment projects do not involve any risk. The assumption was made simply to facilitate the understanding of the capital budgeting techniques. In real life situations, the firm in general and its investment projects in particular are exposed to different degrees of risk. What is risk and how can risk be incorporated and measured in investment decisions in real world situation.

Nature of Risk

In the context of capital budgeting, the term, risk, refers to the chance that a project will prove unacceptable - that is NPV < ₹ 0 or IRR < cost of capital. More formally, risk in capital budgeting is the degree of variability of cash flows. Projects with a small chance of acceptability and a broad range of expected cash flows are more risky than projects that have a high chance of acceptability and a narrow range of expected cash flows.

In the capital budgeting projects, risk stems almost entirely from cash inflows, because the initial investment i.e., cash outflow is generally known with relative certainty. These inflows derive from a number of variables related to revenues expenditures and taxes.



Example: the level of sales, the cost of raw materials, labour rates, utility costs and tax rates.

Risk is associated with the variability of future returns of a project. The greater the variability of the expected returns, the riskier the project. Risk can however be measured more precisely.

Notes



Notes **Risk Analysis in Practice in India**

Most companies in India account for risk while evaluating their capital expenditure decisions. The following factors are considered to influence the riskiness of investment projects:

1. Price of raw material and other inputs
2. Price of product
3. Product demand
4. Government policies
5. Technological changes
6. Project life
7. Inflation

Out of these factors, four factors thought to be contributing most to the project riskiness one selling price – product demand, technical changes and govt. policies.

The most commonly used methods of risk analysis in practice are: sensitivity analysis, conservative forecasts include using short payback or higher discount rate for discounting cash flows.

Except a very few companies, most companies do not use the statistical and other sophisticated techniques for analyzing risk in investment decisions.

Self Assessment

Fill in the blanks:

12. In the context of capital budgeting, the term……., refers to the chance that a project will prove unacceptable.
13. Risk is associated with the …….of future returns of a project.

6.7 Conventional Techniques to Handle Risk

The following are conventional techniques to handle risk in capital budgeting:

- Payback
- Risk adjusted discount rate
- Certainty equivalent

These methods are simple, familiar and partially defensible on theoretical grounds.

6.7.1 Payback

Payback is one of the oldest and commonly used methods for explicitly recognizing risk associated with an investment project. Business firms using this method usually prefer short payback to longer one and often establish policies that a firm should accept guidelines with some maximum

Notes

payback period say three to five years. Apart from simplicity, payback makes an allowance for risk by:

1. Focusing attention on the near term future and thereby emphasizing liquidity through early recovery of capital and
2. By favouring short-term projects over long-term riskier projects.

6.7.2 Risk Adjusted Discount Rate Approach (RAD)

Under this method, the amount of risk inherent in a project is incorporated in the discount rate employed in the present value calculations. The relatively risky projects (e.g. project involving introduction of new product into the untried market) would have relatively high discount rates and relatively safe projects would have relatively low discount rates. The rationale for using different risk adjusted rates for different projects is as follows. The rate of discount or the cost of capital is the minimum acceptable rate of return which the investors demand in providing capital to the firm for that type of investment since such rate is applicable elsewhere in the economy on assets of similar risk. If the project earns less than the rates earned in the economy for that risk, the shareholders will earn less and the value of the company's shares will fall. A well accepted economic premise is that the required rate of return should increase with increase in risks. Hence, the greater the risk, the greater should be the discount rate and vice versa.

The risk-adjusted rate can be used with both the NPV and IRR methods of evaluation of capital expenditure. If NPV were positive, the proposal would qualify for acceptance. In case of the IRR, as a decision criterion, the internal rate of return would be compared with the risk adjusted required rate of return and if the former exceeds the latter, the proposal would be accepted, otherwise not.

The risk in connection with future projections has two dimensions. First as already mentioned, riskiness of the projects at a particular point of time became of the nature of proposals, e.g., expansion of new products. Second, the risk may be different in the case of the same project over time e.g., risk at the end of Second year may be more than that at the end of first year.

Advantage

1. This method is simple to calculate and easy to understand, since companies in actual practice apply different standards of discount for different projects.

Disadvantages and Difficulties

1. Difficulty encountered is how to express a higher risk in terms of higher discount rates. It is doubtful if the exercise would give objective results.
2. It does not make direct use of the information available from the probability distribution of expected future cash. Conceptually, this approach adjusts the wrong element. It is the future cash flow of a project, which is subject to risk and hence should be adjusted and not the required rate of return.
3. The process of adding the risk premium to the discount rate leads to compounding of risk over time. In other words, this method implies increase of risk with time and therefore proposal in which risk does not necessarily increase with the time may not be properly evaluated by this method.

In brief, this method can at best be considered as a crude method of incorporating risk into the capital budgeting analysis.

Notes

Example: Let us determine the risk adjusted net present value of the following:

	A	B	C
Net cash outlays (₹)	1,00,000	1,20,000	2,10,000
Project life	5 years	5 years	5 years
Annual cash inflow (₹)	30,000	42,000	70,000
Co-efficient of variation	0.4	0.8	1.2

The company selects the risk-adjusted rate of discount on the basis of coefficient of variation:

Coefficient of variation	Risk adjusted rate of discount	PV factor 1 to 5 years at risk adjusted rate of discount
0.00	10%	3.791
0.40	12%	3.605
0.8	14%	3.433
1.2	16%	3.274
1.6	18%	3.127
2.0	22%	2.864
More than 2.0	25%	2.689

Solution:

Project	Net cash outflow ₹	Coefficient of variation	Market discount rate	Annual cash inflow ₹	PV Factor (1-5 years) at market discount Rate	Discounted cash inflow ₹	NPV
A	1,00,000	0.4	12%	30,000	3,605	1,08,150	8,150
B	1,20,000	0.8	14%	42,000	3,433	1,44,186	24,186
C	2,10,000	1.2	16%	70,000	3,274	2,29,180	19,180

6.7.3 Certainty Equivalent Approach

Under this method, risk element is compensated by adjusting cash inflows rather than adjusting the discount rate. The risk adjustment factor is expressed in terms of certainty - equivalent coefficient i.e. the relationship between certain (riskless) cash flows and risky (uncertain) cash flows. The certainty equivalent coefficient can assume a value between 0 and 1 and is inversely related with risk. If risk is more, certainty is less and certainty coefficient small and vice-versa. The coefficients can be determined by subjective or objective assessments of cash flows that will rise certainly and cash flows that are likely to occur.

The second step under this approach after conversion of expected cash flows into certainty equivalents, is to calculate their present values based on the risk-free rate of discount (which appropriately reflects the time value of money). Finally, it has to be decided whether the project would be accepted or not, based on either NPV or the IRR method.

Notes

Advantages

1. It is simple to calculate.
2. It incorporates risk by modifying the cash flows, which are subject to risk.
3. Conceptually, it is superior to the time adjusted discount rate approach.

Weaknesses and Difficulties

1. Being a subjective estimate it cannot be objective, precise and consistent, hence conclusions based on such estimates are open to question.
2. It does not directly use the probability distribution of possible cash flows.
3. It cannot be consistently applied to various projects and over time.



Example:

		₹
Cash outflows		1,50,000
Cash inflows	Year 1	70,000
	Year 2	90,000
	Year 3	60,000

Riskless rate of return 9%

Risk adjusted rate of return for the current project 20%

Certainty equivalent coefficients for future cash inflows:

Year 1	0.90
Year 2	0.80
Year 3	0.65

Solution: NPV based on risk-adjusted rate of discount

$$= -150{,}000 + \frac{70{,}000}{1.20} + \frac{90000}{(1.20)^2} + \frac{60000}{(1.20)^3}$$

= – 150,000 + 58,333 + 62500 + 41667 = –150000 + 162500

= 12500, positive; hence project should be accepted

NPV based on certainty equivalent coefficient:

$$= -150{,}000 + \frac{70{,}000 \times 0.90}{1.09} + \frac{90000 \times 0.80}{(1.09)^2} + \frac{60000 \times 0.65}{(1.09)^3}$$

= – 150000 + 57798 + 60601 + 30115

= – 150000 + 148514 = – 1486

= Negative; hence project should not be accepted.

Hence from the above illustration, it is clear that both the above methods may not yield identical results.

Notes



Case Study

Mavis Machine Shop

The case is set in a metalworking shop in West Virginia, one of whose products is drill bits for oil exploration. The time is 1980, in the midst of an oil drilling boom resulting from the oil crises of 1974 and 1979.

Early in 1980, Tom Mavis, President of Mavis Machine shop was considering a project to modernize his plant facilities. The company operated out of a large converted warehouse in Salem, West Virginia. It produced machinery or assorted machined metal parts for the oil and gas drilling and production industry in the surrounding area. One of Mavis major customer was Buckeye Drilling, Inc., which purchased specialized drill bits and replacement parts for its operations. Mavis had negotiated an annual contract with Buckeye to supply its drill bit requirements and related spare parts in each of the past 8 years. In 1978 and 1979 the requirements had been about 8,400 bits per year. All Buckeye's rigs were busy. Mavis knew, there were 30 rigs operating in the state and that it had resin up from 17 in 1972. Wells drilled was up even more, from 679 in 1972 to 1,474 last year.

The arrangement of the machine shop included four large manual lathes currently devoted to the Buckeye business. Each lathe was operated by a skilled worker, and each bit required mechanical keep. Mavis was considering replacing these manual lathes with an automatic machine, capable of performing all four machinery operations necessary for a drill bit. This machine would produce drill bits at the same rate as the four existing lathes, and would only require one operator. Instead of skill in metalworking, the job would now involve more skill in computerized automation.

The four existing manual lathes were 3 years old and had cost a total of $590,000. Together they produced 8,400 drill bits on a two-shift, 5-day/week basis. The useful life of these lathes, calculated on a two-shift/day, 5 day/week basis, was estimated to be 15 years. The salvage value at the end of their useful life was estimated to be $5,000 each. Depreciation of $114,000 had been accumulated on the four lathes. Cash for the purchase of these lathes had been partially supplied by a 10-year, unsecured, 10% bank loan, of which $180,000 was still outstanding. The best estimate of the current selling price of the four lathes in their present condition was $240,000, after dismantling and removal costs. The loss from the sale would be deductible for tax purposes, resulting in a tax savings of 46% of the loss.

The automatic machine being considered needed only one skilled operator to feed in raw castings, observe functioning, and make necessary adjustments. It would have an output of 8,400 drill its annually on a two-shift, 5-day basis. As it would be specially built by a machine tool manufacturer, there was no catalogue price. The cost was estimated to be $680,000, delivered and installed, the useful life would be 15 years. Using a 12-year life (the remaining life of the current lathes). The estimated salvage value would be 10% of the cost.

The automatic lathe was first introduced in 1975 at a cost of $ 750,000. It was expected that as the manufacturing techniques became more generally familiar, the price would continue to drop over the next few years. This price decline was in stark contrast to the inflation in oil services products and supplies which was 18% in both, 1978 and 1979.

A study prepared by the cost accountant to help decide, what action to take, showed the following information. The direct labour rate for lathe operations was $10 per hour including fringe benefits. Pay rates for operators would not change as a result of machining

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Notes

changes. The new machine would use less floor space, which would save $15,000 annually on the allocated charges for square footage of space used, although the layout of the plant was such that the left space unoccupied would be difficult to utilize and no other use was planned. Miscellaneous cash expenses for supplies, maintenance, and power would be $20,000 less per year, if the automatic machine were used. The purchase price was subject to 10% investment tax credit that did not reduce the depreciable cost.

Exhibit 1: Mavis Machine Shop Selected Financial Information
Condensed Income Statement, 1979

Neat Sales	85,364,213
Cost of Goods Sold	3,494,941
Selling, General & Administrative	643,706
Profit before Taxes	81,225,566
Income Taxes	602,851
Net Income	8622,715

Condensed Balance Sheet, 12/31/79

Cash	8532.122	Current Liabilities	8930.327
Accounts Receivable	622.107	long-Term Notes Outstanding (at 10%)	500.000
Inventory	1,858.120	Common Stock	1,000,000
Property Assets	4,390.701	Retained Earnings	5,011,723
	87,442,050		87,442,050

Questions

1. Summarize the net cash flows for the proposed project.
2. For the project, calculate the internal rate of return, the accounting rate of return, the payback period, the net present value and the profitability index.
3. What qualitative factors should be considered in evaluating this project?
4. What decision would you recommend?

6.8 Summary

- Capital budgeting describes the firm's formal planning process for the acquisition and investment of capital and results in a capital budget.
- Traditional Techniques to Analyze Capital budgeting decisions are Payback period, The Payback Reciprocal and Accounting Rate of Return (ARR).
- Three discounted cash flow methods used in capital budgeting are Net Present Value Method (NPV); the Profitability Index or Desirability factor and Internal Rate of Return (lRR).
- The net present value relies on the time value of money and the timings of cash flows in evaluating projects.

Notes

- Internal rate of return is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows.
- The process of selecting the more desirable projects among many profitable investments is called capital rationing.
- Risk in capital budgeting is the degree of variability of cash flows.
- The conventional techniques to handle risk in capital budgeting are Payback, Risk adjusted discount rate and Certainty equivalent method.

6.9 Keywords

Break-Even Time: It is the time taken from the start of the project till the period the Cumulative Present Value of cash inflows of a project equal to present values of the total cash outflows.

Capital Budgeting: It refers to planning and deployment of available capital for the purpose of maximizing long-term profitability of the firm.

Capital Rationing: The allocation of the limited funds available for financing the capital projects to only some of the profitable projects in such a manner that the long term returns are maximized.

Risk-free Rate: The rate at which the future cash flows of a project which is not subjected to risk are discounted.

Risky Investment: Risk in an investment refers to the variability that is likely to occur between the estimated returns and the actual returns.

6.10 Review Questions

1. Why is capital budgeting significant to the firm?
2. How should working capital and sunk costs be treated in analyzing investment opportunities? Explain with suitable examples.
3. Depreciation is a non-cash item and consequently does not affect the analysis of investment proposal using discounted cash flow method. Comment.
4. Contrast the IRR and the NPV methods. Under what circumstances may they lead to
   (a) Comparable recommendation
   (b) Conflicting recommendation in circumstances in which they given contradictory results which criteria should be used to select the project and why?
5. A project costing ₹ 5,60,000 is expected to produce annual net cash benefits of ₹ 80,000 over a period of 15 years. Estimate the internal rate of return. Also find out the payback period and obtain the IRR from it. How do you compare this IRR with one directly estimate?
6. How is risk assessed for a particular investment by using a probability distribution? Discuss the method with an example.
7. Why are cash flows estimated for distant years usually less reliable than for recent years? How can this factor be considered when evaluating the riskiness of a project?
8. What similarities and differences are there between risk adjusted discount rate method and the certainty equivalent method?

Notes

9. What is sensitivity analysis? What are its advantages and limitations?

10. KC company is considering two mutually exclusive projects. The initial cost of both projects is ₹ 5000 and each has an expected life of four years. Under three possible states of economy, their annual cash flows and associated probabilities are as follows:

		Net Cash flow (₹)	
Economic state	**Probability**	**Project A**	**Project B**
Good	0.3	6000	5000
Normal	0.4	4000	4000
Bad	0.3	2000	3000

Answers: Self Assessment

1. Capital budgeting
2. Reversible
3. Two-sided
4. Incidental
5. Minimum
6. Profitability index
7. Internal rate of return
8. Negative
9. capital rationing
10. Zero
11. capital investment
12. Risk
13. Variability

6.11 Further Readings



Books

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Dr Pradeep Kumar Sinha, *Financial Management,* New Delhi, Excel Books, 2009.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management,* New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Unit 7: Concept of Leverages

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Objectives

After studying this unit, you will be able to:

- Describe the notion of leverage;
- Define the operating leverage;
- Explain the significance of financial leverage;
- Discuss the aspect of combined leverage.

Introduction

Leverage results from the use of fixed costs assets or funds to magnify returns to the firm's owners. Generally, increases in leverage results in increased returns and risk; and decreases in leverage results in decrease in returns and risk. The amount of leverage in the firm's capital structure (the mix of long-term debt and equity) can significantly affect its value by affecting returns and risks.

The term 'leverage' in general refers to a relationship between two interrelated variable. In financial analysis, it represents the influence of one financial variable over some other related financial variable.

The three basic types of leverage can be defined with reference to firm's income statement as follows:

1. Operating leverage is concerned with the relationship between the firm's sales revenue and its earnings before interest and taxes, or EBIT (EBIT is descriptive label for operating profits).
2. Financial leverage is concerned with the relationship between the firms EBIT and its common share earnings per share (EPS earnings per share). It is defined as the firm's

Notes

ability to use fixed financial charges to magnify the effects of charge in EBIT/operating profit on firm's earnings per share.

3. Total leverage is concerned with the relationship between the firm's sales revenue and EPS.

7.1 Operating Leverage

Operating leverage results from the existence of the fixed operating expenses in the firm's income stream. The operating costs of a firm fall into three categories:

1. Fixed costs, which may be defined as those do not vary with sales volume, are a function of time and are typically contractual; they must be paid regardless of the amount of revenue available with sales volume.
2. Variable costs, which vary directly.
3. Semi-variable or semi-fixed costs are those, which are partly fixed and partly variable. They are fixed over a certain higher sales volumes. Since the last category of cost can be broken down into fixed and variable components, the cost of a firm in operational terms can be divided into fixed and variables. The operating leverage occurs anytime a firm has fixed costs that must be met regardless of the volume. With fixed costs, the percentage change in profit accompanying a change in volume is greater than the percentage change in volume.



Notes Operating leverage is defined as the firm's ability to use fixed operating costs to magnify effects of changes in sales or its earnings before interest on tax.



Example: A firm sells its product at ₹ 100%, as variable operating cost of 50% and fixed operating cost of ₹ 50,000 per year. Show the various levels of EBIT that would result from sale.

1. 1000 units
2. 2000 units
3. 3000 units.

Solution:

	Case 2 –50%	**Base data**	**Case 1 +50%**
Sales in units	1000	2000	3000
Sales revenue	100,000	200,000	300,000
Less variable operating costs.	50,000	100,000	150,000
Contribution	50,000	100,000	150,000
Less fixed operating costs.	50,000	50,000	50,00
EBIT	ZERO	50,000	100,000
	–100%		+100%

From the above results, certain generalization can be made.

Notes

Case I: A 50% increase in sales (from 2000 to 3000 units) results in a 100% increase in EBIT (from 50,000 to 100,000).

Case II: A 50% decrease in sales (from 2000 to 1000 units) results in a 100% decrease in EBIT (from 50,000 to zero).

$$\text{Hence Operating leverage} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

$$= \frac{+100\%}{+50\%} = 2 \text{ (case I)}, \quad \frac{-100\%}{-50\%} = 2 \text{ (case II)}.$$

Self Assessment

Fill in the blanks:

1. Operating leverage results from the existence of the fixed operating expenses in the firm's …… stream.
2. …… costs are those which do not vary with sales volume.
3. …… costs are those, which are partly fixed and partly variable.
4. …… costs are the costs which vary directly.

7.2 Relation with Break-even Analysis

Break-even analysis is used by the firm.

1. To determine the level of operations necessary to cost all operating costs and,
2. To evaluate the profitability associated with various levels of sales. The firms operating break-even point are the level of sale necessary to give all operating costs. At that point, earnings before interest and taxes equal ₹ zero.

In the example, we see that the firm has reached break-even ('0' profit) at the sales level of 1000 units, at which all the fixed and variable operating costs are coursed.



Did u know? Break-even analysis is sometimes called cost volume profit analysis.

7.2.1 Changing Costs and the Operating Break-even Point

The firm's operating break-even point is sensitive to a number of variables. Fixed operating cost, the sales price per unit and the variable cost per unit. The effects of increase or decrease in these variables can be analyzed as under:

Increase in variable	Effect on operating break-even
Fixed operating costs	Increase
Sales price per unit	Decrease
Variable operating cost per unit	Increase

Notes

7.2.2 Fixed Cost and Operating Leverage

Changes in fixed operating costs affect operating leverage. Significantly, the higher the fixed operating costs, higher are the firms, operating leverage and its operating risks. High operating leverage is good when revenues are rising and bad when they are falling.



Did u know? **What is operating risk?**

Operating risk is the risk of the firm not being able to cover is fixed operating costs.

The larger is their magnitude, the larger is the volume of sales required to cost all fixed costs. The effects of changes in fixed operating expanses on operating leverage can be best explained by continuing our example.



Example: Assume that A Company exchanges a portion of its variable operating costs for fixed operating costs by eliminating sales commission and increasing sales salaries. This change results in reduction of variable operating costs by 5% of sales and increase in fixed operating costs from ₹ 50,000 to ₹ 60,000. At base level of 2000 units, there will be no change in EBIT of ₹ 50,000 but operating leverage will change as shown below.

	Case 2 – 50%	Base data	Case 1 + 5-%
Sales in units	1000	2000	3000
Sales revenue	100,000	200,000	300,000
Less variable operating costs	45,000	90,000	135,000
Contributions	55,000	110,000	165,000
Less fixed operating costs.	60,000	60,000	60,000
EBIT	–5000	50,000	105,000
	–110%		+110%

Hence degree of operating leverage has become $\frac{+110\%}{+50\%} = 2.2$



Task The following data is available for X Ltd.:

Selling price ₹ 120 pu; Variable cost ₹ 70 pu; Total fixed cost ₹ 200,000

1. What is the operating leverage when, X Ltd. produces and sells 6000 units,
2. What is the percentage change that will occur in the operating profit (EBIT) of X Ltd., if output increases by 5 per cent?

Self Assessment

Fill in the blanks:

5. …….. is used by the firm to determine the level of operations necessary to cost all operating costs.
6. Changes in …….. costs affect operating leverage.
7. High operating leverage is good when …….. are rising and bad when they are falling.

Notes

8. The firms operating break-even point are the level of sale necessary to give all …….. costs.

7.3 Financial Leverage

Financial leverage is defined as the ability of a firm to use fixed financial charges to magnify the effects in EBIT/operating profits, on the firm's earning per share, the two fixed financial cost that may be found in the firms income statement are:

1. Interest on debt and
2. Dividends on preferred shares.

These charges must be paid regardless of the amount of EBIT available to pay them.



Notes The financial leverage is favourable when the firm earns more on the investments/ assets financed by the sources having fixed charges. It is obvious that shareholders gain in a situation where a company earns a higher rate of return and pays a low rate to the supplier of long term funds. Financial leverage in such cases is also called "trading in equity."

The degree of financial leverage is the nursical measure of the firms' financial leverage and is calculated as:

$$\text{Financial leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$



Example: C Company Ltd. a small food company expects EBIT of ₹ 10,000 in the current year. It has ₹ 20,000 bond with 10% (annual) coupon rate of interest and 600 shares of ₹ 4 (annual dividend on share) preferred stock outstanding. It has also 1000 equity shares outstanding. The firm is in the 40% tax bracket. Two situations are shown:

Case I: A 40% increase in EBIT from ₹ 10,000 – ₹ 14,000

Case II: A 40% decrease in EBIT from ₹ 10,000 – 6,000

The corresponding change in EPS is shown below:

	Case 2 – 40%	**Base data**	**Case 1 + 40%**
EBIT	₹ 6000	10,000	14,000
Less interest	2000	2,000	2,000
Net profit before tax	4000	8,000	12,000
Less tax @ 40%	1600	3,200	4,800
Net profit after tax	2400	4,800	7,200
Less preferred stock dividend	2400	2,400	2,400
Earnings available to equity shares	0	2,400	4,800
No. of shares	1000	1,000	1,000
Earnings per share (EPS)	0	₹ 2.40	₹ 4.8
	– 100%		+100%

Notes

It is seen that in:

Case No. I – A 40% increase in EBIT has resulted in a 100% increase in earnings per share (from ₹ 2.40 to ₹ 4.80).

Case No. II – A 40% decrease in EBIT has results in a 100% decrease in earning per share (from ₹ 2.40 to ₹ 0).

$$\text{i.e., financial leverage is: } \frac{100\%}{40\%} = 2.5$$

The effect of financial leverage is such that an increase in the firm's EBIT results in a more than proportional increase in the firms earnings per share, whereas a decrease in the firms EBIT results in a more than proportional decrease in EPS.

Task Given Financial leverage is 2. Fixed interest charge ₹ 1,00,000. Find out the operating profit.

Significance of Financial Leverage

Financial leverage is a double-edged sword. On the one hand, it increases earnings per share, and on the other hand it increases financial risk. A high financial leverage means high fixed financial cost and high financial risks, i.e., as the debt component in capital structure increases, the financial leverage increased and at the time of the financial risk also increases. i.e., risk of insolvency increases.

Caution The finance manager is required to trade–off i.e., there has to be a balance between risk and return for determining the appropriate amount of debt in the capital structure of a firm.

Self Assessment

Fill in the blanks:

9. The financial leverage is favourable when the firm earns more on the investments/assets financed by the sources having …….. charges.
10. As the …….. component in capital structure increases, the financial leverage increased.
11. A high financial leverage means high fixed financial cost and high financial …….. .

7.4 Combined Leverage

Combined leverage or total leverage can be defined as potential use of fixed costs, both operating and financial, to magnify the effect of changes in sales on the firms, earnings per share. Total leverage or combined leverage can therefore be viewed as the total impact of the fixed cost in the firms operating and financial structure.

$$\text{Combined leverage} = \text{operating leverage} \times \text{financial leverage.}$$

$$= \frac{\%\text{ change in EBIT}}{\%\text{ change in sales}} \times \frac{\%\text{ change in EPS}}{\%\text{ change in EBIT}} = \frac{\%\text{ Change in EPS}}{\%\text{ Change in Sales}}$$

Significance of Combined Leverage

Notes

A high operating leverage and a high financial leverage combination is very risky. If the company is producing and selling at a high level it will make extremely high profit for its shareholders. But, even a small fall in the level of operations would result in tremendous fall in earnings per share. A company must, therefore, maintain a proper balance between these two leverages.

A combination of high operating level and a low financial leverage indicates that the management is careful since the higher amount of risk involved in high operating leverage has been sought to be balanced by low financial leverage. However, a more preferable option would be to have a low operating leverage and a high financial leverage. A low operating leverage implies that the company reaches its break-even point at a low level of sales. Therefore, risk is diminished. A highly cautious and conservative manager will keep both its operating and financial leverage at a very low level, but the approach may, however, mean that the company is losing profitable opportunities.



Example: Cable Company, a computer cable manufacturer expects sales of 20,000 units @ ₹ 50 per unit in the coming year and must meet the following obligations: Variable operating costs of ₹ 20 per unit, fixed operating costs of ₹ 100,000, interest of ₹ 200,000 as preferred stock dividends of ₹ 120,000. The firm is in the 40% tax bracket and has 50,000 of equity shares outstanding. If we present the levels of earnings per share associated with the expected sales of 20,000 units as with sales of 30,000 units, it will look as below:

	= 50% [% increase in sales (units)]		
Sales in units	20,000	30,000	Operating leverage $= \frac{+60\%}{+50\%} = 1.2$
Sales revenue	₹ 10,00,000	₹ 15,00,000	
Less variable operating costs	400,000	600,000	
Less fixed operating costs	100,000	100,000	
Earnings before interest & taxes EBIT	500,000	800,000	
	+ 60% [% increase in EBIT]		
Less interest	200,000	200,000	
Net profit before taxes	300,000	600,000	
Less taxes 40%	120,000	240,000	
Net profit after tax	180,000	360,000	
Less pref. stock dividends	120,000	120,000	Financial leverage $= \frac{+300\%}{+60\%} = 5.0$
Earnings available for equity shares	60,000	240,000	
No. of shares	50,000	50,000	
Earnings per share	₹ 1.20	₹ 4.80	
	+ 300% [% increase in EPS]		Combined leverage $= \frac{+300\%}{50\%} = 6.0$

The table illustrates that as a result of 50% increase in sales (from 20,000 to 30,000 units), the firm would have a 300% increase in earnings per share (from ₹ 1.20 to ₹ 4.80). Similarly, a 50% decrease in sales would conversely, result in a 300% decrease in earnings per share (not shown in the table). The linear nature of the leverage relationship accounts for the fact that sales charges of equal magnitude in opposite directions results in EPS charges of equal magnitude in the

Notes

corresponding direction. At this point, it should be clear that whenever a firm has fixed units, operating or financial, in its structure, combined leverage would exist.

Impact of Turnover and Capital Turnover Ratio and Working Capital Ratio

An increase in sales improves the net profit ratio, raising the Ratio On Investment (ROI) to a higher level. One may wonder that it will be very attractive for the management to try to raise their capital turnover ratio without restrain. This is not preferable in all situations; since a rise in capital turnover must be supported by an adequate capital base i.e., working capital.

The main reason for a fall in ratio showing the working capital position due to increase in turnover rates is that as the activity increases without a corresponding rise in working capital, the working capital position becomes tight. As the sales increase, both the current assets and current liabilities also increase, but not in direct proportion to the current ratio.

If the current ratio is to be maintained at 2, each increase in sales must result in a two-fold rise in the current assets as compared to current liabilities. But, this does not happen with the same amount of funds, hence a fall in the current ration.



Caution It needs to be ensured that when capital turnover ratio is sought to be increased, its effect on the working capital situation is to be carefully considered.

If the current ratio and the acid test ratio are high, it is apparent that the capital turnover ratio can be increased without any problem. However, it may be very risky to increase capital turnover ratio when the working capital position is not satisfactory.

Self Assessment

Fill in the blanks:

12. Combined leverage is equals to …..……. leverage multiplied by financial leverage.
13. Combined leverage is viewed as the total impact of the …… cost in the firms operating and financial structure.
14. A high operating leverage and a high financial leverage combination is…… .
15. The …… nature of the leverage relationship accounts for the fact that sales charges of equal magnitude in opposite directions results in EPS charges of equal magnitude in the corresponding direction.



Case Study

RKV – Leverage

This case provides the reader with the opportunity to apply different concepts of leverage to the planning process of the firm.

RKV is an important manufacturer of swimming pools. The firm is located in a semi-urban area. The firm's primary markets are hardware and discount stores located in five Northeastern states. Lucid products reach its market mostly by truck.

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Notes

Most of RKV's financial planning is done by George Lee, GM of finance. Lee has recently prepared financial statements estimating next year's operating results. He believes that, the firm will earn just over $800,000 in the current year on sales of $8 million and is forecasting sales of $13 million next year. It is likely, that variable costs will remain at approximately the same percentage of sales next year as this year. Fixed costs will probably rise to 12 per cent next year.

Company A has an EBIT of $2.6 million, no debt, $8 in equity (300,000 shares), $18 million. Company B has the same level of sales, an EBIT of $2.85 million, $3.3 and sales of debt at 11 per cent, and $8 in equity (300,000 shares). The tax rate is 35 per cent.

RKV has been investigating the addition of a number of new product lines to be sold through its existing distribution channels. Two items have been of particular interest. The first would involve the production and sale of chaise lounges for use around swimming pools. The product would be aimed at commercial users, such as hotels, but could be sold through hardware and discount stores as a residential product. The second new item would be a patio umbrella. The umbrella would be a large, 12-rib, multicolored canvas with fringe and would be aimed at the residential market. Both products would fit in with RKV's existing product line and neither would require any increase in networking capital.

In his analysis regarding the new product proposals, George Lee recognized that, the firm would have to build new facilities to produce each product. The lounges would require an investment of $3.8 million which would include the purchase and installation of manufacturing and packaging machinery. The umbrellas, although a relatively simple concept, would require an investment of $6 million for efficient production. For both products, it would take 80 days to install the equipment. This means that production could begin by January 1st.

Len Haton, the firm's vice-president of sales, has prepared sales estimates for the two products. He forecasts $4 million in sales for the lounges and $ 4.3 million in sales for the umbrellas on annual basis. The report from the cost accounting department estimates variable costs of two-third of the sales value for the lounge unit and 61 per cent for the umbrellas. Fixed costs would be $400,000 and $ 650,000, respectively.

To finance the new projects, Lee has been working with Lucid's investment bankers. At a recent meeting, Lee was told that the firm could raise money from two sources under the current market conditions. First, it could borrow on an 11 year note at 12 per cent for either or both the projects in an amount not exceeding $ 8.5 million. Second, the investment bankers felt confident that they could underwrite a preferred stock issue with a 12 per cent dividend up to a dollar amount of $6 million. The issue would have to be cumulative with respect to dividends. Common stock financing would not be a possibility at present.

RKV Balance Sheet (Projected through December 31 this Year)

Cash	$ 425,000
Accounts receivables	750,000
Inventory	500,000
Fixed Assets	7,650,000
	$ 9,325,000
Current liabilities	$ 600,000
Long-term debt (10%)	3,800,000
Common stock ($3 par)	1,500,000
Retained earnings	3,425,000
	$ 9,325,000

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Notes

Question

What would be the effect of acceptance of each project on leverages? Would it give a favourable financial leverage to RKV?

RKV Income Statement (Projected through December 31 this Year)

EBIT	1,926,520
EBT	1,536,520
Fixed Costs	1,043,480
Interest	390,000
Marginal contribution	2,970,000
Net Income	1,027,303
Sales	$ 8,000,000
Taxes	509,217
Variable Costs	5,030,000

7.5 Summary

- In financial analysis, leverage represents the influence of one financial variable over some other related financial variables.
- The amount of leverage in the firm's capital structure can significantly affect its value by affecting returns and risks.
- Operating leverage is concerned with the relationship between the firm's sales revenue and its earnings before interest and taxes, or EBIT

$$\text{Operating leverage} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

- Break-even analysis, sometimes called cost volume profit analysis, is used by the firm to determine the level of operations necessary to cost all operating costs.
- High operating leverage is good when revenues are rising and bad when they are falling.
- The financial leverage is favourable when the firm earns more on the investments/assets financed by the sources having fixed charges.

$$\text{Financial leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

- Combined leverage or total leverage can be defined as potential use of fixed costs, both operating and financial, to magnify the effect of changes in sales on the firms, earnings per share.

  Combined leverage = operating leverage × financial leverage.

7.6 Keywords

Debt: It is that which is owed; usually referencing assets owed.

Degree of Operating Leverage: It is the change in the percentage of operating income (EBIT) for the change in percentage of sales revenue.

Notes

Financial Leverage: It is the payment of fixed rate of interest for the use for the fixed interest bearing securities, to magnify the rate of return as equity shares.

Leverage: It allows accomplishing certain things that are otherwise not possible.

Operating Income: It is a measure of a firm's profitability that excludes interest and income tax expenses.

Operating Leverage: It results from the present fixed operating expenses within firm's income stream.

Operating Risk: It is the risk of the firm not being able to cover its fixed operating costs.

Return on Assets: This percentage shows how profitable a company's assets are in generating revenue.

7.7 Review Questions

1. What is meant by the term leverage? How are operating leverage, financial leverage and total leverage related to the income statement?
2. What is operating break-even point? How do charges in fixed operating costs, the sale price per unit and the variable operating cost per unit affect it?
3. What is operating leverage? What causes it? How is the degree of operating leverage measured?
4. What is financial leverage? What causes it? How is the degree of financial leverage measured?
5. What is the general relationship among operating leverage, financial leverage and the total leverage of the firm? Do these types of leverage complement each other? Why or why not?
6. A firm has sales of ₹ 7500,000, variable cost of ₹ 42,00,000 and fixed cost of ₹ 6,00,000. It has a debt of ₹ 45,00,000 @ 9% and equity of ₹ 55,00,000.
   (a) What is the firm's ROI?
   (b) Does it have favorable financial leverage?
   (c) What are the operating financial and combined leverages of the firm?
   (d) If the sales drop to ₹ 500,00,000, what will be the new EBIT?
7. The capital structure of P Company consists of ordinary share capital of ₹ 10,00,000 (shares of ₹ 100 per value) and ₹ 10,00,000 of 10% debentures. Sales increased by 20% from 100,000 to 120,000 units; the selling price is ₹ 10 per unit, variable costs amount to ₹ 6 per unit and fixed expenses amount to ₹ 200,000. The income tax rate is 50%. You are required to calculate the following :
   (a) The percentage increase in earnings per share
   (b) The degree of financial leverage at 100,000 units and 120,000 units.
   (c) The degree of operating leverage of 100,000 and 120,000 units.
8. The selected financial data A, B & C Companies for the year ending 31st December, 2004 are as follows:

Notes

	A	B	C
Variable expenses on % of sales	66 2/3	75	50
Interest expenses	₹ 200	₹ 300	₹ 1000
Degree of operating leverage	5-1	6-1	2-1
Degree of financial leverage	3-1	4-1	2-1
Income tax rate.	50%	50%	50%

Prepare income statement for A, B and C.

9. X Corporation has estimated that for a new product its break-even point is 2,000 units of P. This item is sold for 14%(identified variable cost ₹ 7 per unit). Calculate the degree of operating leverage for sales volume of 2,500 units and 3,000 units. What do you infer from the degree of operating leverage at the sales volume of 2,500 units and 3,000 units and their differences, if any?

10. ABC companies capital structure is of ₹ 5 lakh, [₹ 100 each share] and 10 per cent debt capital equity of ₹ 2,00,000. The sales are increased by 20 per cent from 50,000 to 60,000 units. ₹ 10 is the selling price per unit, and ₹ 6 is variable cost per unit and fixed expenses amount to ₹ 1,00,000. Tax rate is 10 per cent calculate.

    (a) Percentage increase in EPS

    (b) The degree of operating leverage at 5,0000 units and 60,000 units

    (c) The degree of financial leverage at 50,000 units and 60,000 units

11. Calculate operating and financial leverages under situations A, B and C and Financial plan 1,2, and 3 respectively from the following functions of XYZ Co. Also find out the combination of operating and financial leverage that gives the highest value and least value:

    Installed capacity = 12,000 units;

    Actual production & sales = 800 units

    Selling price = ₹ 15 p.u;

    Variable cost = ₹ 10 p.u

    Fixed Cost = Situation A, ₹ 1000; Situation B, ₹ 2000; Situation C, ₹ 3000

12. Calculate the degree of operating leverage, degree of financial leverage, and the degree of combined leverage for the following firms and interpret the results:

Particulars	P	Q	R
Output (Units)	3,00,000	75,000	5,00,000
Fixed Cost (₹)	3,50,000	7,00,000	75,000
Variable Cost per unit (₹)	1.00	7.5	0.1
Interest Expenses (₹)	25,000	40,000	----
Selling Price per unit (₹)	3.00	25.00	0.50

13. From the following data, calculate operating leverage.

Year	EBIT (₹)	Sales in units
1998	60,000	3,00,000
1999	70000	3,60,000

Notes

14. Calculate operating leverage. Interest ₹ 5,0000; sales ₹ 50,000; Variable cost ₹ 25,000; Fixed cost ₹ 15,000.

15. AMC Company Ltd. provided the following information and requested you to Calculate (a) Operating leverage with 4000 and 6000 quantity of sales, (b) operating BEP (Q). Given, Selling price ₹ 300, variable cost ₹ 200, Fixed cost ₹ 2, 40,000.

Answers: Self Assessment

1.	income	2.	Fixed
3.	Semi-variable or semi-fixed	4.	Variable
5.	Break-even analysis	6.	fixed operating
7.	revenues	8.	operating
9.	fixed	10.	debt
11.	risks	12.	operating
13.	fixed	14.	very risky
15.	linear		

7.8 Further Readings



Books

Chandra, P., *Financial Management - Theory and Practice,* New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Dr Pradeep Kumar Sinha, *Financial Management,* New Delhi, Excel Books, 2009.

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Unit 8: Capital Structure Decision

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Objectives

After studying this unit, you will be able to:

- Explain the concept of capital structure;
- Differentiate between capital structure and financial structure;
- Learn about the various theories of capital structure;
- Discuss the optimum capital structure;
- Describe the various forms of capital structure.

Introduction

Every organisation requires funds to run and maintain its business. The required funds may be raised from short-term sources or long-term sources or a combination both the sources of funds, so as to equip itself with an appropriate combination of fixed assets and current assets. Current assets to a considerable extent, are financed with the help of short-term sources. Normally, firms are expected to follow a prudent financial policy, as revealed in the maintenance of net current assets. This net positive current asset must be financed by long-term sources. Hence, long-term sources of funds are required to finance for both (a) long-term assets (fixed assets) and (b) networking capital (positive current assets).

The long-term financial strength as well as profitability of a firm is influenced by its financial structure. The term 'Financial Structure' refers to the left hand side of the balance sheet as represented by "total liabilities" consisting of current liabilities, long-term debt, preference share and equity share capital. The financial structure, therefore, includes both short-term and long-term sources of funds.

A firm can easily estimate the required funds by a detailed study of the investment decision. In other words, anticipation of the required funds may be estimated by analyzing the investment decision. Once anticipation of required funds is completed then the next step is financial for the manager to make decisions related to the finance or the selected investment decisions. Generally capital is raised from two prime sources (a) equity and (b) debt. Than the question is what should be the proportion of equity and debt in the capital structure of a company.

8.1 Meaning of Capital Structure

Capital structure is that part of financial structure, which represents long-term sources. The term capital structure is generally defined to include only long-term debt and total stockholder investment. The term capital structure refers to the mix of long-term sources of funds, such as equity shares capital, reserves and surpluses, debenture, long-term debt from outside sources and preference share capital. To quote Bogen, "Capital structure may consists of a single class of stock, or it may be complicated by several issues of bonds and preferred stock, the characteristics of which may vary considerably". In other words, capital structure refers to the composition of capitalisation, i.e., to the proportion between debt and equity that make up capitalisation. Capital structure indicated by the following equation:

Capital Structure = Long-term Debt + Preferred Stock + Net worth

or

Capital Structure = Total Assets – Current Liabilities

Notes

Thus, the capital structure of a firm consists of the shareholder funds and debt. The inherent financial stability of an enterprise and risk of insolvency to which it is exposed, are primarily dependent on the source of its funds as well as the type of assets it holds and relative magnitude of such asset categories.

8.2 Optimum Capital Structure

In taking a financing decision, the financial manager's job is to come out with an optimum capital structure. Optimum capital structure is that capital structure at that level of debt - equity proportion, where the market value per share is maximum and the cost of capital is minimum. The same to quote, Ezra, "optimum leverage is that mix of debt and equity which will maximise the market value of the company and minimise the company's overall cost of capital." The study of capital structure involves a discussion of the nature of the industry and specific circumstances of the business enterprise in question, besides the general theory of finance. It is difficult to define an ideal capital structure. A company's capital structure is a function of the nature of its business an how risky the particular business is, and therefore, a matter of business judgment.

As observed by Van Horne, "In the optimum capital structure, the marginal real cost of each available method of financing is the same". As Guthmann and Dougall rightly remark, from a strictly financial point of view, the optimum capital structure is achieved by balancing the financing, so as to achieve the lowest average cost of long-term funds. This in turn produces that maximum market value for the total securities issued against a given amount of corporate income. The optimum capital structure keeps balance between share capital and debt capital. The primary reason for the employment of debt by an enterprise can be stated as upto a certain point, debt is from the point of view of the ownership, a less expensive source of funds than equity capital. Hence, optimum capital structure keeps a balance between debt capital and equity capital.

8.3 Features of an Appropriate Capital Structure

Construction of optimum capital structure is very important for a firm, since its value depending on the capital structure. Hence, the financial manager or the concerned person should develop an appropriate capital structure, which is helpful to maximise shareholder wealth. This can be done only when all those factors., which are relevant to the company's capital structure decision, are properly analysed and balanced. Capital structure should be planned, keeping in view the interest of ordinary shareholder because they are the ultimate owners of a business enterprise and have the right to select the directors. However, the interest of the other groups, such as, employees, customers, creditors, society and government should also receive reasonable consideration. There is no tailor-made capital structure for all business enterprises. There are certain common characteristics that categorise industries. The study of capital structure involves a study of the debt-equity mix with the object of lowering the overall cost of capital and with a view to maximizing the market value of the firm's securities.

An appropriate capital structure should have the following features:

1. ***Profitability/Return:*** As we have seen in the above discussion the appropriate capital structure is one, which is most advantageous. With the constraints, maximum use of leverage at a minimum cost should be made. In other words, it should generate maximum returns to the owners without adding additional cost.
2. ***Solvency/Risk:*** The use of more or excessive debt threatens the solvency of the firm. Debt should be used till the point where, debt does not add significant risk, otherwise use of debt should be avoided.

Notes

3. ***Flexibility:*** Flexible capital structure means it should allow the existing capital structure to change according to the changing conditions without increasing cost. It should also be possible for the firm to provide funds whenever needed to finance its possible activities. The Firm should also repay the funds if not required.
4. ***Conservation/Capacity:*** Capital should be conservative in the sense that the debt capacity of a firm should not be exceeded. In other words, the capital structure should be determined within the debt capacity of the firm and not beyond the firm's capacity. The debt capacity of a firm depends on its ability to generate future cash inflows. It should have enough cash to pay its fixed charges and principal sum.
5. ***Control:*** Use of more equity may lead to loose my control of the company. The competitors from (closely held firms) are particularly concerned about the dilution of control. Hence, construction of capital structure should not involve the risk of loss of control over the firm.

The above stated are the general features of an appropriate capital structure. There may be particular features for a firm, which may be additional. Further, the weight given to each of these features will differ from firm to firm.

Self Assessment

State whether the following statements are true or false:

1. Company issues preference shares or redeemable debentures when it requires finance.
2. Trading on equity uses the variable cost sources of finance in capital structure of firm.
3. Optimum leverage is that mix of debt & equity which will maximise the market value of the company.
4. Capital structure that allows the existing capital structure to change according to the changing conditions without increasing the costs is called flexible capital structure.
5. EBIT-EPS Approach is helpful to analyse the impact of debt use on the shareholders value.

8.4 Computation of Optimal Capital Structure

As we already know that optimum capital structure is that capital structure at debt equity proportion where the market value per share and value of the firm is maximum or the overall cost of capital is minimum. But here, since, calculation of market value of share or value of the firm is beyond the scope of this book. Hence, capital structure is calculated based on overall cost of capital.

Illustration 1: In considering the most desirable capital structure of a company, a financial manager has estimated the following:

Debt as a % of total Capital Employed	Cost of Equity (%)	Cost of Debt (%)
0	10.0	6.0
10	10.0	6.0
20	10.5	6.0
30	11.0	6.5
40	12.0	7.0

You are required to determine the optimal debt – equity mix or optimal capital structure by the calculation of overall cost of capital.

Notes

Solution:

Equity Weight (W_e)	Debt Weight (W_d)	Cost of Equity (K_e)	Cost of Debt (K_d)	Overall cost of Capital (K_o = %) $K_o = [K_e (W_e) + K_d (W_d)] \times 100$
1.00	0.00	0.100	0.06	[(0.10 × 1.0) + (0.06 × 0.0)] × 100 = 10
0.90	0.10	0.100	0.06	[(0.10 × 0.90) + (0.06 × 0.10)] × 100 = 9.6
0.80	0.20	0.105	0.06	[(0.105 × 0.80) + (0.06 × 0.20)] × 100 = 9.68
0.70	0.30	0.110	0.065	[(0.11 × 0.70) + (0.065 × 0.30)] × 100 = 9.65
0.60	0.40	0.120	0.07	[(0.12 × 0.60) + (0.07 × 0.40)] × 100 = 10

Calculation of Overall Cost of Capital

Here optimal capital structure is one, with 90 per cent equity and 10 per cent debt since K is less (9.6).

8.5 Determinants of Capital Structure

Capital structure may be determined at the time of promotion of the firm or during the latter stages. But determining optimal capital structure at the time of promotion is very important and it should be designed very carefully. Management of any firm should set a target capital structure and the subsequent financing decisions should be made with a view to achieve the target capital structure. Construction of capital structure, is difficult, since it involves a complex trade off among several factors or considerations. Keeping the objective of wealth maximisation in mind, capital structure has to be determined. The following factors affect optimal capital structure:

1. ***Tax benefit of Debt:*** Debt is the cheapest source of long-term finance, when compared with other source equity, because the interest on debt finance is a tax-deductible expense. Hence, debt can be accepted as a tax-sheltered source of finance, which helps in shareholder wealth maximisation.

2. ***Flexibility:*** Flexibility is one of the most important and serious factors, which is considered in determining capital structure. Flexibility is the firm's ability to adopt its capital structure to the needs of changing conditions. Changing conditions may be, need of more funds for investments or having substantial funds that are already raised. Whenever there is a need to have more funds to finance profitable investments, the firm should be able to rise without delay and less cost. On the other hand, whenever there are surplus funds, the firm should be able to repay them. The above two conditions are fulfilled only when there is a flexible capital structure. In other words, the financial plan of a firm should be able to change according to their operating strategy and needs. The flexibility of capital structure depends on the flexibility in fixed charges, the covenants and debt capacity of the firm.

3. ***Control:*** The equity shareholder have voting right to elect the directors of the company. Raising funds by way of issue of new equity shares to the public may lead to loss of control. If the management wants to have total control on the firm then, it may require to raise funds through non-voting right instrument that is debt source of finance. But the firm needs to pay interest compulsory on debt finance. Debt finance is preferred only when the firm's debt service capacity is good. Otherwise the creditors may seize the assets of the firm to satisfy their claims (interest). In this situation management would lose all control. It might be better to sacrifice a measure of control by some additional equity finance rather than run the risk of loosing all control to creditors by employing too much debt. Widely held companies can raise funds by way of issue of equity shares, since the shares are widely scattered and majority of shareholder are interested in the return. At the same time if they are not satisfied with the firm, they will switch over to some other firm, where they expect higher return.

Notes

4. ***Industry Leverage Ratios:*** The Industry standards provide benchmark. Firm can use industry leverage ratio as standard for construction of capital structure. Because industry standard may be appropriate to the firm. It does not mean that all firms in the industry are having optimum capital structure. Put it simple, they may be using more leverage or less leverage, but it suggests that whether the firm is out of line or not, if it is it should know the reasons why and be satisfied with the reasons.

5. ***Seasonal Variations:*** Use of more or less financial leverage depends on the seasonal variations of the business. Low degree of financial leverage (less debt) is preferable when a firm's business is seasonal in nature. Example, Businesses such as production and sale of umbrellas, fans, air coolers., industries requires less debt capital in their capital structure. Use of more debt may make the firm unable to pay interest obligations in lean years, which would lead to financial distress. On the other hand, industries involved in business, where there is no seasonality, like consumer non-durable products (food items, soaps, etc) or with items in habitual use (cigarette) or all those products, which have an inelastic demand are not likely to be subject to wide fluctuations in sales can use more debt in their capital structure, since they are able to earn regular profit.

6. ***Degree of Competition:*** Competition in the industry also determines the capital structure. When, there is no or less competition then, the firms can use less equity or more debt in their capital structure, since they can sell more products at higher prices. Example, public utility corporations like gas, electricity, etc. On the other hand, competitive firms have to use more equity in their capital structure, because of competition; they may not be able to sell more units and cannot earn more profits. Example, garment industry, home appliances industry.

7. ***Industry Life Cycle:*** The Industry life cycle consists of introduction stage; growth stage; maturity stage and declining stage. The industry in infancy should use less debt capital or more equity capital in capital structure, since the profit earning capacity is less due to less sales where as when a firm is in its growing stage (fast) and having more profits, it can go for more debt or less equity that helps to maximise shareholder wealth.

8. ***Agency Costs:*** Agency costs arises when there is a conflict of interest among owners, debenture holders and the management. Conflict may arise due to the transferring of wealth to debt holders in their favour. The agency problem is handled through monitoring and restrictive covenants, which involve costs that are called agency costs. The financing strategy of a firm should seek to minimise the agency costs, by way of employing an external agent who specialises in low-cost monitoring. Management should use debt finance to the extent that it maximises the wealth of shareholders, not beyond that.

9. ***Company Characteristics:*** Characteristics like size and credit standing among other companies (within or outside industry). Small firm's ability to raise funds from outside is limited when compared to large firms. Small firms have to depend on owners' funds for financing activities. In other words, investors perceive that investment in small firms is more risky than the large firms. On the other hand, large firms are forced to make use of different sources of funds, because no single source is sufficient to their needs.

   When it comes to the credit rating characteristics a firm enjoying high credit rating may get funds easily from the capital market, as compared to other firms, which are having low credit rating. Because investors and creditors prefer to invest and grant loans to high credit rating firms, since the risk is less.

10. ***Timing of Public Issue:*** Timing of public offer is also one of the most important factors considered while planning the capital structure. Public offering should be made at a time when, that state of the economy as well as capital market is ideal to provide the funds.

Notes

For example during 2003 to 2004 period, many firms like Vijaya Bank, IOB, Union Bank, TCS, IOC, NTPC come up with IPO due to ideal capital market and the economy. Prices as well as yields on securities depend on the money policy pursued by the government. Scarcity of debt money and equity funds leads to high interest rates and low price earnings (P/E) ratios. Therefore, company has to decide whether to finance infancy stage with equity funds and latter stages (except declining) with debt funds or vice versa.

11. ***Requirements of Investors:*** Before going to issue a particular instrument to the public or investors to raise funds, there is a need to know the investors requirements. Investors may be institutional investors. (LIC, GIC, UTI) as well as individual investors. Some investors are ready to take risk (bold investors.), who prefer capital gains and control and hence, equity shares are suitable to them. On the other hand, investors. (cautious), who are interested in the safety of their investment and stable returns, prefer to invest in debentures, since satisfying their needs and preference share are more suitable to the investors. (less cautious), who prefers stable returns and share in profits.

12. ***Period of Finance:*** Period of finance also plays a crucial role in determining the capital structure. A firm can issue redeemable debentures or preference shares, when the finance is required for a limited period. For example, for 5 years, firm can issue 5 years redeemable debentures or preference shares. But equity share capital is the best source when the firm needs finance for unlimited period (unknown).

13. ***Purpose of Finance:*** Debt source of finance is suitable when a firm is planning to invest in productive (avenues) purpose. For example, investment on machinery, where as, if the firm is planning to raise funds for non-productive purpose, it can raise funds from equity source for example social responsibility or general development on a permanent basis.

14. ***Legal Requirements:*** There are some guidelines on shares and debentures issued by the government that are very important for the construction of the capital structure. For example, the controller of capital issues, now SEBI grants to consent for capital issue when, (a) debt equity ratio does not exceed 2 : 1 (higher ratio may be allowed for capital intensive projects), (b) the ratio of preference capital to equity capital does not exceed 1 : 3 and (c) promoters hold at least 2.5 per cent of the equity capital.



Did u know? **Patterns/Forms of Capital Structure**

The following are the forms of capital structure.

1. Complete equity share capital;
2. Different proportions of equity and preference share capital;
3. Different proportions of equity and debenture (debt) capital; and
4. Different proportions of equity, preference and debenture (debt) capital.

8.6 Assumption of Capital Structure Theories

1. There are only two sources of funds i .e. debt and equity.
2. The total assets of the company are given and do not change.
3. The total financing remains constant. The firm can change the degree of leverage, either by selling the shares and retiring debt or by issuing debt and redeeming equity.
4. Operating profits (EBIT) are not expected to grow.

Notes

5. All the investors are assumed to have the same expectation about the future profits.
6. Business risk is constant over time and assumed to be independent of its capital structure and financial risk.
7. Corporate tax does not exit.
8. The company has infinite life.
9. Dividend payout ratio = 100%.



Notes **Definitions and Symbols Used**

S = Total market value of equity shares.

B = Total market value of debt

I = Total interest payments.

V = Total market value of the firm

NI = Net income available to equity shareholders.

V = B+S

Cost of debt (Kd) = 1/ B

Value of debt (B) = 1/ K_e

Cost of equity capital (K_e) = D1/P + g

Because of assumption no-4 growth rate = O. So, K_e = D/P and since payout ratio = 100% D = earnings or dividends.

Therefore, K_d= E/P

Multiplying both, numerator and denominator by the number of shares, we get:

$$K_e = \frac{E \times N}{P \times N} \qquad \frac{EBIT - 1}{S} \text{ or } NI$$

$$K_e = \frac{\text{Net income available to the shareholder}}{\text{Total market value of equity shares}}$$

Overall costs of Capital (K_o)

K_o = W_1 K_d + W_2 K_e (W_1 & W_2 are weights)

$$B/V(K_d) + S/V(K_e) \text{ or } \frac{B}{B+S}(K_d) + \frac{S(K_e)}{B+S}$$

or

$$K_o = \frac{1 + NI}{V} = \frac{EBIT}{V}$$

so

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

Notes

Self Assessment

Fill in the blanks:

6. Keeping the objective of …… in mind, capital structure has to be determined.
7. …… is the firm's ability to adopt its capital structure to the needs of changing conditions.
8. The …… shareholder have voting right to elect the directors of the company.
9. …… is preferred only when the firm's debt service capacity is good.
10. Firm can use industry leverage ratio as standard for construction of…… .

8.7 Theory of Capital Structure

The long-term source of finance, which a company may use for investments, may be broadly classified into two types. They are debt capital and equity capital. The financial manager must determine the proportion of debt and equity and financial leverage. Understanding the relationship between financial leverage and cost of capital is extremely important for taking capital structure decisions. Theoretically the value of a firm can be maximized when the cost of capital in minimized. That capital structure, where the cost of capital is minimum, is known as optimum capital structure. Existence of optimum capital structure is not accepted by all. There exist extreme views. The first viewpoint strongly supports the argument that, the financing or debt equity mix has a major impact on the shareholders wealth. The second, however, is of the opinion that, capital structure is irrelevant.

There are four major theories explaining the relationship between capital structure, cost of capital and valuation of the firm. They are:

1. Net Income approach (NI)
2. Net Operating Income approach (NOI)
3. Traditional approach
4. Modigliani-Miller approach

8.7.1 Net Income Approach (NI)

According to this approach, the cost of debt and the cost of equity do not change with a change in the leverage ratio. As a result, the average cost of capital declines as the leverage ratio increases. This is because when the leverage ratio increases, the cost of debt, which is lower than the cost of equity, gets a higher weightage in the calculation of the cost of capital.

This approach has been suggested by David Durand. According to this approach, capital structure decision is relevant to the valuation of the firm. According to the theory it is possible to change the cost of capital by changing the debt equity mix. In other words, a change in the capital structure causes a change in the overall of capital as well as the value of the firm.

The formula to calculate the average cost of capital is as follows:

$K_o = K_d (B/ (B+S)) + K_e (S/(B+S))$

Where,

K_o is the average cost of capital

K_d is the cost of debt

Notes

B is the market value of debt

S is the market value of equity

K_e is the cost of equity

The NI approach is based on the following assumptions:

1. The use of debt does not change the risk of investors and therefore, cost of debt (K_d) and cost of equity (K_e) remains the same irrespective of the degree of leverage.
2. Cost of debt is less than the cost of equity.
3. The corporate income tax does not exist.

According to the theory, cost of debt is assumed to be less than the cost of equity. Therefore, when the financial leverage is increased (proportion of debt in the total capital), the overall cost of capital will decline and the value of the firm will increase. The implications of the three assumptions of NI approach is that, as the degree of leverage increases, the proportion of a cheaper source of funds (debt) in the capital structure increases. As a result, the weighted average cost of capital tends to decline leading to an increase in the total level of the firm. Thus, even if the cost of debt and cost of equity remains same regardless of leverage, increased use of low cost debt will result in the decline of overall cost of capital and thereby, maximize the value of the firm. So the overall cost of capital will be minimum when the proportion of debt in the capital structure is maximum. Hence, optimum structure exists when the firm employs 100% debt or maximum debt in the capital structure.

The NI approach may be compared to a dishonest trader who wants to sell 10 litres of milk @ ₹ 15 per litre. He can add water and pure milk to prepare the 10 litres of milk. If the cost of 1 litre of water is ₹ 1, and cost of 1 litre of pure milk is ₹ 10, he can maximise his profit or minimize his cost per litre of milk by adding more and more of low cost water. For example, if he purchases only pure milk, his cost will be ₹ 10×10 = ₹ 100. If he adds 5 litres of water to 5 litres of milk, the cost of 10 litres would be 1×5+10×5 = (₹ 5.5/litre). Here, pure milk is compared to equity, which is a costly source, and water is compared to debt, which is a cheaper source.

Illustration 2: A Company's expected net operating income (EBIT) is ₹ 1,00,000. The company has issued ₹ 5,00,000, 10% debentures at ₹ 100 each. The cost of equity is 12.5%. Assuming no taxes, find out the overall cost of capital and the value of the firm according to NI approach.

Solution:

S = Value of equity shares (NI/K_e) (₹)	4,00,000
Net operating income (₹)	1,00,000
Less: Interest, on debentures (₹)	50,000
Earning available to ESH (NI) (₹)	50,000
Cost of equity (K_e)	12.5%
Value of debt (B) (₹)	5, 00,000
Total Value of the firm (S+B=V) (₹)	9,00,000
Overall cost of capital (EBIT/V)	11.1%

Alternatively, $K_o = K_d (W_1) + K_e (W_2)$

$$\frac{5,00,000(0.10)}{9,00,000} + \frac{4,00,000(0.125)}{9,00,000} = 11.1\%$$

Notes

Assuming the market price per share to be ₹ 100, there will be 4000 shares of ₹ 100 each. Find out the effect of increase in leverage on the cost of capital (K_o) and value of the firm.

Assume that the above company increases the debt from ₹ 5,00,000 to ₹ 6,00,000 and the cost of the debt and equity remains at the same level. We can calculate the overall cost of capital, value of the firm and the market value of equity shares as shown below.

EBIT	1,00,000
Less: Int on debt	60,000
Earnings available to ESH (NI)	40,000
K_e	0.125
Value of equity shares (NI/K_e) = S	3,20,000
Value of debt (B)	6,00,000
Value of the firm (S+B=V)	9,20,000

$$K_o = \frac{EBIT}{V} = \frac{1,00,000}{9,20,000} = 10.86\%$$

Alternatively K_o can be calculated as below:

$K_o = K_d(W_1) + K_e(W_2)$

$$\frac{6,00,000(0.10)}{9,20,000} + \frac{3,20,000(0.125)}{9,20,000} = 10.87\%$$

Market Value of Equity Shares

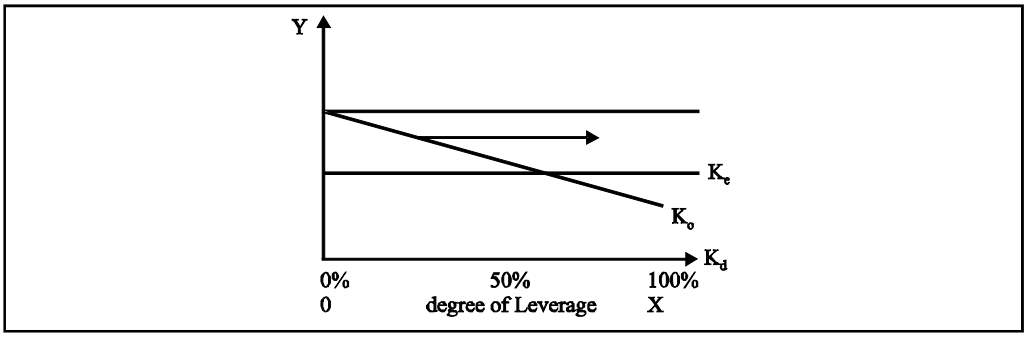
Before increasing the debt, there were 4000 ES of ₹ 100 each . Then the firm increased the debt by ₹ 1,00,000 and used the proceeds to retire equity shares. So the company redeemed 1000 shares of ₹ 100 each. So the number of shares outstanding is 4000 – 1000=3000. Therefore, value of 1 equity share is:

$$₹ \frac{3,20,000}{3000} = ₹ 106.67$$

So, the market value of equity shares has increased to ₹ 106.67.

To sum up, according to the NI approach, as the debt content is increased in the capital structure, Ko falls, value of the firm increases and the market value of the equity shares also increases.

We can graph the relationship between K_o, K_e and K_d with the degree of leverage as shown below.



The degree of leverage is plotted along the X-axis, while the cost of Capital in per cent is plotted on Y-axis. As the cost of debt and cost of equity is constant with leverage, we find that both the

Notes

curves are horizontal to X-axis. As the degree of leverage increases (% of debt in the total capital increase) overall cost of capital continuously falls. K_o is minimum when, there is 100% debt. So optimum capital structure exists at 100% debt and 0% equity capital. But in practice, 100% debt may not be possible. There should be some equity capital in the capital structure of any company.

8.7.2 Net Operating Income Approach

This theory is also given by David Durand. This is just the opposite to NI approach. According to NOI approach, the capital structure decision is irrelevant and there is nothing like optimum capital structure. All the capital structures are optimum.

According to this theory, the market value of the firm is not affected by the capital structure changes. The market value of the firm is found by capitalizing (dividing) the net operating income by the overall cost of capital, which is constant. The market value of the firm is obtained by using the following formula.

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

The overall cost of capital depends on the business risks of the firm, which is assumed to be constant. NOI depends on the investments made by the company and not on the capital structure decisions. So, if NOI and K_o are constant, the value of the firm must remain same regardless of leverage.

Assumptions

The market capitalizes the value of the firm as a whole. Thus, the split between debt and equity is not important. The value of the firm is obtained by capitalizing NOI by the K_o, which depends on the business risks. If business risks is constant, K_o is also constant.

The use of debt increases the risks of shareholders, So, K_e increases with the leverage and eats completely the advantage of low cost debt.

1. Cost of debt remains same regardless of leverage.
2. Corporate income tax does not exist.

The critical assumptions of this approach are that K_o remains same regardless of the degree of leverage. The market capitalizes the value of the firm as a whole and the split between debt and equity is unimportant. The benefits from the increase in the use of cost debt is completely offset (neutralised) by the increases in the cost of equity. So even if the leverage is increased, overall cost of capital remains at the same level. When the company increases the leverage, the firm becomes more risky and equity shareholders penalize the firm by demanding higher and higher rate of returns. So, K_e is the function of the debt equity ratio. Since overall cost of capital structure remains static according to the theory.

Illustration 3: A company's expected annual net operating income (EBIT) is ₹ 1,00,000. The company has 5,00,000, 10% debentures. The overall cost of capital is 12.5%. Calculate the value of the firm and cost of equity according to NOI approach.

Solution:

Net operating income (EBIT) (₹)	1,00,000
Overall cost of capital (K_o)	0.125
Total value of the firm ($V=EBIT/K_o$) (₹)	8,00,000
Market value of the debt (B) (₹)	5,00,000
Total market value of the equity (S=V-B) (₹)	3,00,000

Notes

$$\text{Cost of equity} = \frac{NI}{S} = \frac{\text{Earning available to ESH}}{\text{Market value of equity shares}}$$

$$K_e = \frac{EBIT - I}{V - B} = \frac{1,00,000 - 50,000}{8,00,000 - 5,00,000} = 16,66\%$$

Market value of equity shares: Assuming the market price of shares to be ₹ 100, there are 3000 shares of ₹ 100 each.

If the company increases the debt from ₹ 5,00,000 to ₹ 6,00,000 the Ke and the value of the firm are as below:

Net operating income (EBIT) (₹)	1,00,000
Overall cost of capital (K_o)	0.125
Total value of the firm (V=EBIT/K_o)(₹)	8,00,000
Market value of debt (B) (₹)	6,00,000
Market value of the equity (S) (₹)	2,00,000

$$\text{Cost of equity} = \frac{NI}{S} = \frac{40,000}{2,00,000} = 20\%$$



Caselet

Rise in Net Income

Cognizant Technology Solutions Corporation, the US-based software company with offshore development centres in India, reported a 17 per cent increase in net income to $112 million during the fourth quarter ended December 2008 against $96 million in the fourth quarter of 2007.

Quarterly revenue rose to $753 million, up 26 per cent from the $600 million in the fourth quarter of 2007, and up 2.5 per cent from $735 million in the third quarter of 2008.

Net income for the full year was $431 million, a 23 per cent increase over the $350 million reported in 2007. Revenue for 2008 increased to $2.82 billion, up 32 per cent from $2.14 billion for 2007, according to a company press release.

Based on current global economic weakness and recent customer feedback, Cognizant has said that its first quarter revenue in 2009 is anticipated to be $735 million and full-year revenue for the year to be at least $3.1 billon, up at least 10 per cent when compared to 2008 numbers.

Source: thehindubusinessline.com

Market Value of the Equity Shares

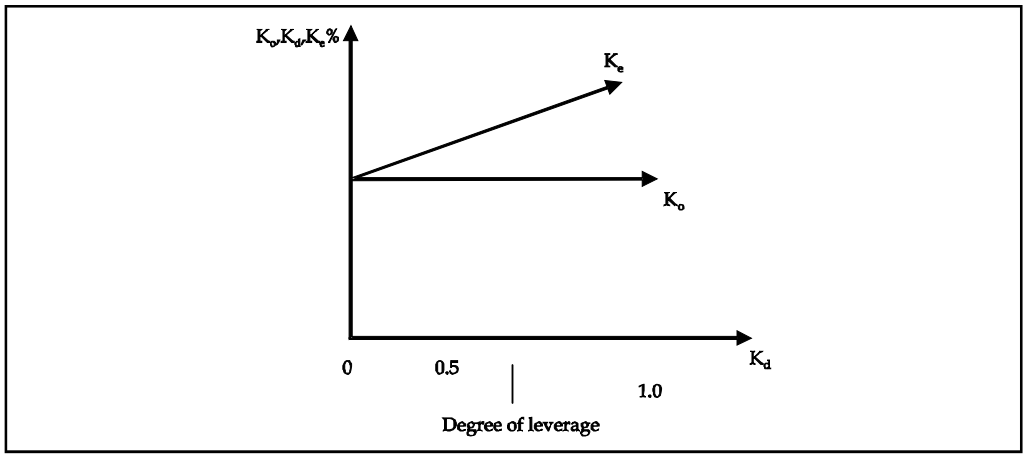
The firm has increased the debt by ₹ 1,00,000 and used the proceeds to reduce equity capital. The number of shares has reduced from 3000 to 2000. Therefore, the price per share can be calculated as below:

$$\text{Price per share} = \frac{\text{Total market value of the shares}}{\text{Number of shares}}$$

So, there is no change in the price per share, total value of the firm and overall cost of the capital when the leverage is changed.

Notes

NOI approach can be graphically shown as below:



From the above graph, it is clear that, as the degree of leverage is increased, K_o and K_d remains at the same level. But cost of equity increases with leverage and exactly neutralises the benefits of low cost debt. So overall cost of Capital remains at the same level.

8.7.3 Traditional or Intermediate Approach or WACC Approach

This approach is midway between the NI and the NOI approach. The main propositions of this approach are:

The cost of debt remains almost constant upto a certain degree of leverage but rises thereafter, at an increasing rate. The cost of equity remains more or less constant or rises gradually up to a certain degree of leverage and rises sharply thereafter. The cost of capital due to, the behaviour of the cost of debt and cost of equity, decreases upto a certain point and remains more or less constant for moderate increases in leverage, thereafter, rises beyond that level at an increasing rate.

In other words NI approach and NOI approach represents two polar cases. The traditional or the intermediate approach is a midway between these two approaches, because it partly takes the features of both the approaches.

According to the theory, the value of the firm can be increased or cost of capital can be reduced by a judicious mix of debt and equity capital. This approach states that, cost of capital is a function of leverage. So cost of capital decreases upto a certain degree of leverages then it remains at the same level for certain degrees of leverage and thereafter it rises sharply with the leverage. So optimum capital structure exists when the cost of capital is minimum or value of the firm is maximum.

The manner in which cost of capital reacts to the changes in the capital structure can be divided into three stages.

1. In the first stage, cost of equity remains constant or rises slightly with the debt. But when it increases, it does not increase fast enough to offset the advantage of low cost debt. Cost of debt also remains same or rises slightly with the leverage. As the cost of debt is less than cost of equity, increased use of debt reduces the cost capital during the 1st stage.
2. Once the firm has reached the certain degree of leverage, increased use of debt does not result in the fall in the overall cost of capital. This is due to the fact that, benefits of low cost debt are offset by the increase in the cost of equity. Within this range, cost of capital will be minimum or value of the firm will be maximum.
3. Beyond a certain point, use of debt has unfavourable effect on cost of capital and value of the firm. This happens because the firm would become more risky to the investors and

Notes

hence they would penalize the firm by demanding higher return. Here, advantages of using low cost debt are less than the disadvantages of higher cost of equity. So the overall cost of capital increases with leverage and value of the firm decreases.

Thus, the cost of capital decreases with leverage, reaches one minimum point and thereafter, increases with the leverage.

Illustration 4: Assume that the firm has EBIT of ₹ 4,00,000. The firm has 10% debentures of ₹ 10,00,000 and the cost of equity is 16%. Find out the value of the firm and overall cost of capital according to the traditional approach.

Solution:

EBIT (₹)	4,00,000
Less: Interest (₹)	1,00,000
Earnings available to ESH (₹)	**3,00,000**
Cost of equity	0.16
Market value of the equity shares (₹) NI/K_e = 3,00,000/0.16	**18,75,000**
Market Value of the debt (B)	10,00,000
Total Value of the firm (S+B)	**28,75,000**

Overall cost of capital (K_o) = $\frac{EBIT}{V} = \frac{4,00,000}{28,75,000}$ = 13.9%

Now, let us assume that the firm increases the debt to another ₹ 5,00,000. So cost of debt increases to 11% and cost of equity rises to 17%. Calculate the overall cost of capital and the value of the firm.

EBIT (₹)	4,00,00,00
Less: Interest (₹)	1,65,000
Earnings available to ESH (₹)	2,35,000
Cost of equity	0.17
Value of equity shares (S = NI / K_e) (₹)	13,82,352
Value of debt (₹)	15,00,000
Value of the firm (V) (₹)	28,82,352

Overall cost of capital (K_o) = $\frac{EBIT}{V} = \frac{4,00,000}{28,82,353}$ = 13.8%

If the debt is further increased to ₹ 5,00,000 the cost of debt increases to 12.5% and the cost of equity is increased to 20%. Find out the overall cost of capital and value of the firm.

EBIT	4,00,000
Less: Interest (₹)	2,50,000
Earning available to ESH (₹)	1,50,000
Cost of equity	0.20
Value of equity shares (S=NI/K_e)	7,50,000
Value of debt (B) (₹)	20,00,00
Value of the firm (V=S+B) (₹)	27,50,000

Notes

8.7.4 Modigliani-Miller Approach (MM)

MM theory relating to the relationship between cost of capital and valuation is similar to the NOI approach. According to this approach, the value of the firm is independent of its capital structure. However, there is a basic difference between the two. The NOI approach is purely a definitional term, defining the concept without behavioural justification. MM approach provides analytically sound, logically consistent, behavioral justification in favour of the theory and considers any other theories of Capital structure as incorrect.

Assumption

Capital markets are perfect. This means,

1. Investors are free to buy and sell securities.
2. Inventors can borrow and lend money on the same terms on which a firm can borrow and lend.
3. There are no transaction costs.
4. They behave rationally.
5. Firms can be classified into homogenous risk categories. All the firms within the same class will have the same degree of business risks.
6. All the investors have the same expectations from a firm's NOI with which to evaluate the value of the firm.
7. Dividends Payout ratio is 100% and there are no retained earnings.
8. There are no corporate income taxes. This assumption is removed later.

Three Basic Propositions of MM Approach

The overall cost of capital (K_o) and the value of the firm (V) are independent of leverage. The K_o and V are constant for all the degree of leverage. The total value of the firm is obtained by capitalizing the EBIT at a discount rate appropriate for its risks class.

1. Cost of equity (K_e) is equal to the capitalization rate of a pure equity stream plus a premium for financial risk. The financial risks increases with the leverage and therefore, K_e increases in a manner to offset exactly the benefit from the use of low cost debt.

$$K_e = K_o + (K_o - K_d)\ B/S.$$

2. The cut-off rate for investment purposes is completely independent of the way in which an investment is financed. This is true because cost of capital remains same regardless of the degree of leverage. So both, investment decision and financing decision are independent.



Notes **Proof of MM Argument**

The value of a firm depends on its profitability and risks. It is in variant with respect to relative changes in the firm's capitalization. Similarly, according to the theory, cost of capital and market value of the firm must be same regardless of the degree of leverage.

The operational justification for the MM hypothesis is the "Arbitrage Argument". The term arbitrage refers to the act of buying a security in the market, where the price is less and

Notes

simultaneously selling it in another market where the price is more, to take advantage of the difference in price prevailing in two different markets. Arbitrage process helps to bring equilibrium in the market. Because of arbitrage, a security cannot be sold at different prices in different markets. MM approach illustrates the arbitrage process with reference to valuation in terms of two firms, which are exactly similar in all aspects with respect to leverage, so that one of them has debt in the capital structure while other does not. Such homogenous firm's are, according to MM, perfect substitutes. If the market value of the two firms which are exactly same in all the respects, except with the leverage, which is not equal, investors of the overvalued firm would sell their shares, borrow additional funds on their personal account and invest in the undervalued firm, in order to obtain the investors for arbitrage is termed as homemade or personal leverage. So investor undertaking arbitrage would be better off. This behaviour of arbitrage will have investors of overvalued firm. Arbitrage would be counting till the market prices of two identical firms become identical.

For example: Assume that there are two firms L and U which are identical in all the respects except that, the firm L has 10% ₹ 5,00,000 debentures. The EBIT of both the firms are ₹ 80,000. The cost of equity of the firm L is higher at 16% and firm U is lower at 12.5%. The total market values of the firm are computed as below.

Solution:

	FIRM L	**FIRM U**
EBIT	80,000	80,000
Less: Interest	50,000	-
Earnings available to ESH (NI)	**30,000**	**80,000**
Cost of equity (K_e)	0.16	0.125
Market value of equity shares (S=NI/K_e)	**1,87,500**	**6,40,000**
Market value of debt	5,00,000	------
Total value of the firm	**6,87,500**	**6,40,000**
$K_o = \frac{EBIT}{V} =$	11.63%	12.5%

Thus, the total value of the firm which employed debt is more than the value of the other firm. According to MM, this previous arbitrage would start and continue till the equilibrium is restored.

8.7.5 Modigliani and Miller Theory

MM theory is based on the assumption of no tax approach. It is made up of two propositions which can also be extended to a situation with taxes.

Example: Let us take the example of two firms which are identical except for their financial structures. The first (Firm X) is unlevered: that is, it is financed by equity only. The other (Firm Y) is levered: it is financed partly by equity, and partly by debt. The Modigliani-Miller theorem states that the value of the two firms is the same.

With taxes

Proposition I:

$V_y = V_x + TD$

Notes

where

V_y is the value of a levered firm.

V_x is the value of an unlevered firm.

TD is the tax rate (T) × the value of debt (D)

The term TD assumes debt is perpetual

This means that there are advantages for firms to be levered, since corporations can deduct interest payments. Therefore leverage lowers tax payments. Dividend payments are non-deductible.

Proposition II:

$r_E = r_0 + D/E\ (r_0 - r_D)(1 - T)$

where

r_E is the required rate of return on equity, or cost of equity.

r_0 is the cost of capital for an all equity firm.

r_D is the required rate of return on borrowings, or cost of debt.

D/E is the debt-to-equity ratio.

T is the tax rate.

The same relationship as earlier described stating that the cost of equity rises with leverage, because the risk to equity rises, still holds. The formula however has implications for the difference with the WACC. Their second attempt on capital structure included taxes has identified that as the level of gearing increases by replacing equity with cheap debt the level of the WACC drops and an optimal capital structure does indeed exist at a point where debt is 100%.

The following assumptions are made in the propositions with taxes:

1. Corporations are taxed at the rate T on earnings after interest,
2. No transaction costs exist, and
3. Individuals and corporations borrow at the same rate

Illustration 5: Assume two firms firm U and L which are identical in terms of their asset and operations. Firm U is unlevered firm (all equity) with operating earning (EBIT) of ₹ 1000 with the marginal tax rate is 40%. Firm L is a levered firm that has issued 2000 perpetual bonds with an interest rate is 10%. Calculate the tax impact of both the companies.

Solution:

	Firm U	Firm L
EBIT	1000	1000
Interest exp.	0	200
EBT	1000	800
Taxes	400	320
Net income	600	480

Notes

Understanding the tax benefit associated with firm L's debt is important. While firm L must pay its bond holders 200 as interest payment it will pay ₹ 80 less in taxes. The interest payment shielded some of firm L's taxable income from tax.

Self Assessment

State whether the following statements are true or false:

11. Net income approach of capital structure was propounded by David Durand.
12. According to NI approach the cost of debt and the cost of equity change with a change in the leverage ratio.
13. According to NI theory, cost of equity is assumed to be less than the cost of debt.
14. Net Operating Income (NOI) theory is propounded by David Durand.
15. According to NOI theory, the market value of the firm is not affected by the capital structure changes.
16. The WACC approach is midway between the NI and NOI approach.
17. According to WACC approach, the cost of debt remains almost constant up to certain degree of leverage but decreases thereafter at an increasing rate.

8.8 Working of the Arbitrage Process

Suppose there is an investor X, who holds 10% of the outstanding shares in the firm L. This means his holding amounts to ₹ 18,750 and his shares in the earning which belongs to equity shareholders is ₹ 3000 (10% of ₹ 30,000). Mr. X will sell his holding in the firm L and invest money in the firm U. The firm U has no debt in the capital structure and hence, the financial risk to Mr. X would be less in the firm U than firm L. In order to have the same degree of financial risk as of the firm U, Mr. X will borrow additional funds equal to his proportionate shares in substituted personal leverage in place of corporate leverage.

The position of Mr. X is summarized as below.

Firm L

Investment amount	(10% holding)	18,750
Dividend income	(10% of 30000)	3,000
Return on funds	$\frac{3000}{18,750} = 16\%$	

Firm U

Investment amount (18,750 + 50,000) = 68,750

(50,000 borrowed at 10%)

Less: Interest on loan	5,000
Return on investment	3,593.75

$$ROI = \frac{3,593.75}{18,750} = 19.16\%$$

So Mr. X gets a higher income after shifting his investment to company U (₹ 3,000 and 3,593.75) His ROI increases from 16% to 19%. The other investors will also wish to make profit out of

Notes

arbitrage. This increases the demand for securities of the firm U and will lead to increase in its price. At the same time, the price of the security of the firm L will decline due to the selling pressure. This will continue till the prices of the securities of the firms become identical.

Taxes: If the corporate taxes are taken into consideration. MM argues that the value of the firm will increase and cost of capital will decrease with leverage. Interest paid on the debt is tax deductible and therefore, effective cost of debt is less than the coupon rate of interest. Therefore, levered firm would have a greater market value than the unlevered firm (cost capital of levered firm would be lower).

Symbolically:

$$VL = VU + BT$$

where, VL = Value of levered firm

VU = Value of unlevered firm

B = Amount of debt

T = Tax rate

8.9 The Trade-off Theory: Cost of Financial Distress and Agency Costs

As the debt-equity ratio (i.e. leverage) increases, there is a trade-off between the interest tax shield and bankruptcy, causing an optimum capital structure, D/E*

The trade-off theory of capital structure is a theory in the realm of Financial Economics about the corporate finance choices of corporations. Its purpose is to explain the fact that firms or corporations usually are financed partly with debt and partly with equity. It states that there is an advantage to financing with debt, the tax benefit of debt and there is a cost of financing with debt, the costs of financial distress including bankruptcy costs of debt and non-bankruptcy costs (e.g. staff leaving, suppliers demanding disadvantageous payment terms, bondholder/ stockholder infighting, etc.). The marginal benefit of further increases in debt declines as debt increases, while the marginal cost increases, so that a firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity to use for financing. Although the empirical success of the alternative theories is often dismal, the relevance of this theory has often been questioned. For example, Miller's (1977) metaphor speaks of the balance between those two as equivalent to the balance between horse and rabbit content in a stew of one horse and one rabbit. Other critics have suggested it is the mechanical change in asset prices that makes up for most of the variation in capital structure.

Recognize that costs of financial distress and agency costs are real.

8.9.1 Trade-off Model

Financial distress costs (includes bankruptcy)

1. ***Direct costs:*** Lawyer's fees, court costs, administrative expenses, assets disappear or become obsolete.
2. ***Indirect costs:*** Managers make short-run decisions; customers and suppliers may impose costs.

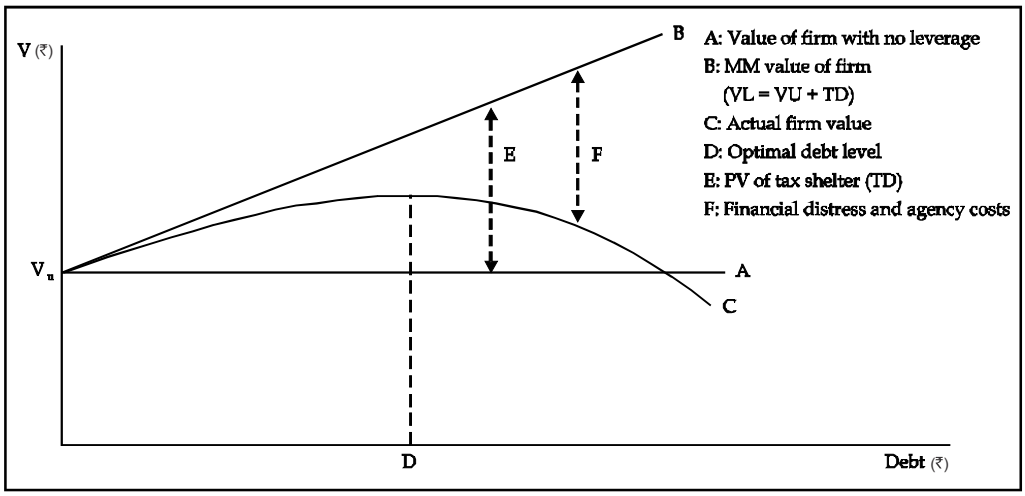
8.9.2 Agency Costs

More debt is likely to be experienced. Distress stockholders (thus management) want risk, while bondholders do not.

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Use covenants to align interests costs: monitoring to ensure they are followed; also may hamper business. In essence, lost efficiency and monitoring costs reduce advantage of debt, given agency costs and financial distress.

VL = VU + TD – (PV of expected costs of financial distress) – (PV of agency costs)



8.9.3 Consequences of Financial Distress

Bankruptcy Costs

Specific bankruptcy costs include legal and administrative costs along with the sale of assets at 'distress' prices to meet creditor claims. Lenders build into their required interest rate the expected costs of bankruptcy, which reduces the market value of equity by a corresponding amount.

Indirect Costs

1. Investing in risky projects
2. Reluctance to undertake profitable projects
3. Premature liquidation
4. Short-term orientation

Debt Policy and Shareholders Conflicts

Shareholder-manager Conflicts

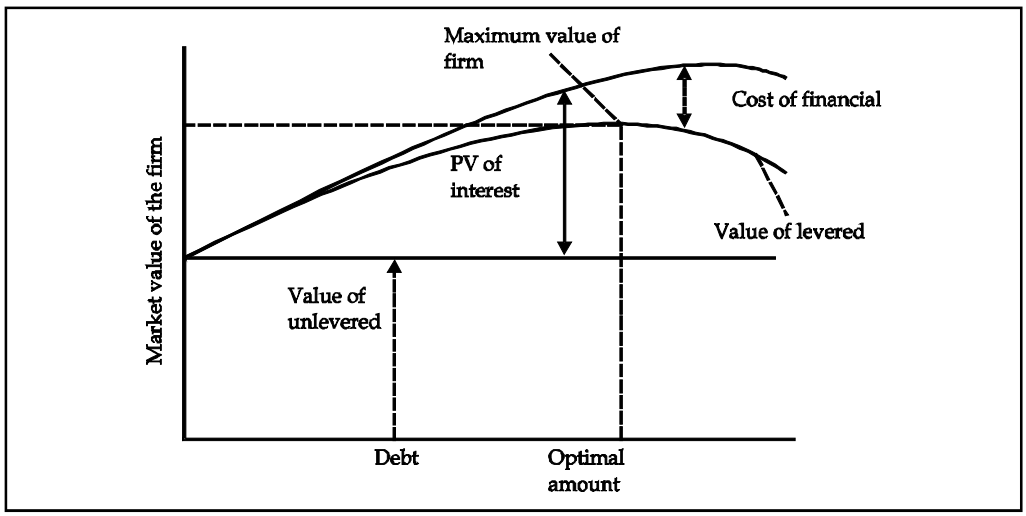
Managers have a tendency to consume some of the firm's resources in the form of various perquisites.

Managers have a tendency to become unduly risk-averse and shirk their responsibilities as they have no equity interest, or when their equity interest falls. They may be passing up profitable opportunities.

Shareholder-bondholder Conflicts

Notes

Shareholder value is created either by increasing the value of the firm or by reducing the value of its bonds. Increasing the risk of the firm or issuing substantial new debt are ways to redistribute wealth from bondholders to shareholders. Shareholders do not like excessive debt.



8.9.4 Optimum Capital Structure: Trade-off Theory

The optimum capital structure is a function of:

1. Agency costs associated with debt
2. The costs of financial distress
3. Interest tax shield

The value of a levered firm is:

Value of unlevered firm

+ PV of tax shield

– PV of financial distress

8.10 Pecking Order Theory – Overview

In the theory of firm's capital structure and financing decisions, the Pecking Order Theory or Pecking Order Model was developed by Stewart C. Myers in 1984. It states that companies prioritize their sources of financing (from internal financing to equity) according to the law of least effort, or of least resistance, preferring to raise equity as a financing means "of last resort." Hence, internal funds are used first, and when that is depleted, debt is issued, and when it is not sensible to issue any more debt, equity is issued. This theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required.

Pecking order theory of capital structure states that firms have a preferred hierarchy for financing decisions. The highest preference is to use internal financing (retained earnings and the effects of depreciation) before resorting to any form of external funds. Internal funds incur no flotation costs and require no additional disclosure of proprietary financial information that could lead

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to more severe market discipline and a possible loss of competitive advantage. If a firm must use external funds, the preference is to use the following order of financing sources: debt, convertible securities, preferred stock and common stock (Myers, 1984). This order reflects the motivations of the financial manager to retain control of the firm (since only common stock has a 'voice' in management), reduce the agency costs of equity, and avoid the seemingly inevitable negative market reaction to an announcement of a new equity issue (Hawawini & Viallet, 1999).

Implicit in the pecking order theory are two key assumptions about financial managers. The first of these is asymmetric information, or the likelihood that a firm's managers know more about the company's current earnings and future growth opportunities than do outside investors. There is a strong desire to keep such information proprietary. The use of internal funds precludes managers from having to make public disclosures about the company's investment opportunities and potential profits to be realized from investing in them. The second assumption is that managers will act in the best interests of the company's existing shareholders. The managers may even forgo a positive-NPV project if it would require the issue of new equity, since this would give much of the project's value to new shareholders at the expense of the old (Myers & Majluf, 1984).

8.10.1 Capital Market Treatment of New Security Issues

The two assumptions noted above help to explain some of the observed behaviour of financial managers. More insight is gained by looking at how the capital markets treat the announcement of new security issues. Announcements of new debt generally are treated as a positive signal that the issuing firm feels strongly about its ability to service the debt into the future. Announcements of new common stock are generally treated as a negative signal that the firm's managers feel the company's stock is overvalued (i.e. earnings are likely to decline in the future) and they wish to take advantage of a market opportunity. So it is easy to see why financial managers use new common stock as a last resort in capital structure decisions. The mere announcement of a new stock issue will cause the price of the firm's stock to fall as the market participants try to sort out the implications of the firm choosing to issue a new equity issue.

8.10.2 How Pecking Order is Superior to the Trade-off Model

While the trade-off model implies a static approach to financing decisions based upon a target capital structure, the pecking order theory allows for the dynamics of the firm to dictate an optimal capital structure for a given firm at any particular point in time (Copeland & Weston, 1988). A firm's capital structure is a function of its internal cash flows and the amount of positive-NPV investment opportunities available. A firm that has been very profitable in an industry with relatively slow growth (i.e. few investment opportunities) will have no incentive to issue debt and will likely have a low debt-to-equity ratio. A less profitable firm in the same industry will likely have a high debt-to-equity ratio. The more profitable a firm, the more financial slack it can build up.

Financial slack is defined as a firm's highly liquid assets (cash and marketable securities) plus any unused debt capacity (Moyer, McGuigan, and Kretlow, 2001). Firms with sufficient financial slack will be able to fund most, if not all, of their investment opportunities internally and will not have to issue debt or equity securities. Not having to issue new securities allows the firm to avoid both the flotation costs associated with external funding and the monitoring and market discipline that occurs when accessing capital markets.

Prudent financial managers will attempt to maintain financial flexibility while ensuring the long-term survivability of their firms. When profitable firms retain their earnings as equity and build up cash reserves, they create the financial slack that allows financial flexibility and, ultimately long-term survival.

Notes

The pecking order theory explains these observed and reported managerial actions, while the trade-off model cannot. It also explains stock market reactions to leverage-increasing and leverage-decreasing events, which the trade-off model cannot.

8.10.3 Limitations of Pecking Order Theory

The pecking order theory, however, does not explain the influence of taxes, financial distress, security issuance costs, agency costs, or the set of investment opportunities available to a firm upon that firm's actual capital structure. It also ignores the problems that can arise when a firm's managers accumulate so much financial slack that they become immune to market discipline. In such a case, it would be possible for a firm's management to preclude ever being penalized via a low security price and, if augmented with non-financial takeover defences, immune to being removed in a hostile acquisition. For these reasons, the pecking order theory is offered as a complement to, rather than a substitution for, the traditional trade-off model.

Conclusions and implications: While the traditional trade-off model is useful for explaining corporate debt levels, the pecking order theory is superior for explaining capital structure changes. By including a discussion of pecking order theory in the capital structure unit, students will be exposed to a broad base of both theory and practice that will enable them to better understand how important financing decisions are made. In addition to the traditional discussion of the impact of taxes, financial distress, and agency costs upon capital structure decisions, students will gain insight to how management motivations and market perceptions also impact these decisions. Students will readily appreciate the concern managers have regarding the reporting requirements required to access capital markets. They will also be able to explain why observed practice does not seem to always follow theory.

Furthermore, the addition of the pecking order theory into the basic debate about capital structure provides one more opportunity for critical thinking to occur. For example, the instructor can show how the debt ratios of leading companies, in particular industries, differ from the so-called industry averages to which most companies are usually compared during a cross-sectional financial analysis. Thus, a given ratio (such as a debt ratio only half the industry average) might be argued as a 'good' thing (since the firm has a large supply of financial slack and financial flexibility) rather than as a point of concern (the firm has opportunity costs due to not making efficient use of debt). Students will have to critically evaluate that particular condition to judge which conclusion is correct.

To summarize, by studying the pecking order theory in conjunction with trade-off theory, students will have a more all-round exposure to optimal capital structure. We also briefly look at the important differences between the two theories.

8.11 Approaches to Determine Appropriate Capital Structure

The following are the approaches to determine a firm's capital structure: EBIT - EPS Approach, Valuation Approach and Cash flow Approach

1. ***EBIT - EPS Approach:*** This approach is helpful to analyse the impact of debt on earnings per share.
2. ***Valuation Approach:*** This approach determines the impact of debt use on the shareholder value.
3. ***Cash Flow Approach:*** This approach analyses the firm's debt service capacity.

Apart from the above ROI - ROE analysis, ration analysis is also used. But here in this book, we will discuss the first (EBIT - EPS) approach only.

Notes

8.11.1 EBIT-EPS (Approach) Analysis

Here we shall try to understand how sensitive are Earnings Per Share (EPS) to the changes in Earnings Before Interest and Tax (EBIT) under different financial plans/capital structures/ alternatives. It is known as EBIT-EPS analysis. Use of fixed cost sources of finance in capital structure of a firm is known as financial leverages/trading on equity. In other words, use of less cost source of finance to maximise Earnings Per Share (EPS), but the benefits are more when a firm uses debt as a source of finance, due to cheap and interest is tax deductible source. Use of debt can be used to maximise shareholder wealth only when a firm has a high level of operating profit (EBIT). EBIT-EPS analyses is one way to study the relation between Earnings Per Share (EPS) and various possible levels of operating profit (EBIT), under various financial plans.

Illustration 6: XYZ Co. Ltd. has a share capital of ₹ 1,00,000 face value of ₹ 10 each. It requires ₹ 50,000 to finance expansion programme and is considering three alternative financial plans.

1. Issue of 5000 ordinary shares of ₹ 10 each
2. Issue of 500 preference shares of ₹ 100 each at 10 per cent and
3. Issue of 10 per cent debentures of ₹ 50,000

The company's operating profit (EBIT) after additional investment is ₹ 40,000 per annum. Tax rate is 50 per cent. Show the effect of use of debt in financial plan.

Solution:

Calculation of EPS

Particulars	Financial Plan		
	I (Equity) (₹)	II (Preference) (₹)	III Debt – Equity (₹)
EBIT	40,000	40,000	40,000
Less: Interest	---	---	5,000
EBT/or PBT	**40,000**	**40,000**	**35,000**
Less: Tax at 50%	20,000	20,000	17,500
PAT or EAT	**20,000**	**20,000**	**17,500**
Less: Preference dividend	---	5,000	---
Earnings available to share holders.	**20,000**	**15,000**	**17,500**
No. of shares outstanding	15,000	10,000	10,000
EPS = $\frac{\text{Earnings available to shareholder}}{\text{No. of equity shares}}$	**1.333**	**1.5**	**1.75**

Illustration 7: VS International Ltd., has a capital structure (all equity) comprising of ₹ 5,00,000 each share of ₹ 10. The firm wants to raise an additional ₹ 2,50,000 for expansion project. The firm has the following four alternative financial plans I, II, III and IV. The firm is able to earn an operating profit at ₹ 80,000 after additional investment and 50 per cent tax rate. Calculate EPS for all four alternatives and select the preferable financial plan.

1. Raise the entire amount in the form of equity capital.
2. Raise 50 per cent as equity capital and 50 per cent as 10 per cent debt capital.
3. Raise the entire amount as 12 per cent debentures.
4. Raise 50 per cent equity capital and 50 per cent preference share capital at 10 per cent.

Notes

Solution:

Calculation of EPS

Particulars	Financial Plan			
	I ₹	II ₹	III ₹	IV ₹
EBIT	80,000	80,000	80,000	80,000
Less: Interest	---	12,500	30,000	---
EBT	**80,000**	**67,500**	**50,000**	**80,000**
Less: Tax at 50%	40,000	33,750	25,000	40,000
EAT	**40,000**	**33,750**	**25,000**	**40,000**
Less: Preference dividend	---	---		12500
Earnings available to share holders.	**40,000**	**33,750**	**25000**	**27500**
No. of shares (equity) outstanding	75,000	62,500	50,000	62,500
EPS	**0.53**	**0.54**	**0.50**	**0.44**

As EPS is maximum as per plan-II, this is most-preferable financial plan.

8.11.2 Indifference Point

The break-even EBIT level of indifference point, is when the EPS is same for two alternative capital structures. It may be defined as the level of EBIT beyond which the benefits of financial leverage begin to operate with respect to Earnings Per Share (EPS). In other words, if the expected level of EBIT is less than the indifference point, it is advantageous with the use of equity capital to maximise EPS.

Indifference point between two capital structures can be obtained by using the following formula:

$$\frac{(x - I_1)(1 - t) - PD(1 + Dt)}{ES_1} = \frac{(x - I_2)(1 - t) - PD(1 + Dt)}{ES_2}$$

Where

X = EBIT $I_1 I_2$ = Interest under alternatives 1 and 2

t = Tax rate PD = Preference dividend

Dt = Preference dividend tax

ES_1, ES_2 = No. of equity share outstanding under alternative 1 and 2

Illustration 8: WDC Ltd., has a total capitalisation of ₹ 10 lakh consisting entirely of equity capital (₹ 10 each share). It is planning to raise an additional funds of ₹ 5 lakh for implementing capital budgeting project. There are two alternatives available to the company.

1. Entire equity share capital by issue of shares.
2. Entire amount by debt at 10 per cent interest.

The company is in the tax brackets of 50 per cent. Calculate indifference point.

Solution:

Indifference point formula

$$= \frac{(x - I)(1 - 0.5)}{ES_1} = \frac{(x - 1)(1 - 0.5)}{ES_2}$$

$$= \frac{x(1 - 0.5)}{(1,00,000 + 50000)} = \frac{(x - 50,000)(1 - 0.5)}{1,00,000}$$

$$= 50,000x = 75,000x - 3,75,00,00,000$$

Notes

$$3,75,00,00,000 = 75,000x - 50,000x = 25,000x$$

$$x = 3,75,00,00,000/25,000$$

$$x = ₹\ 150,000$$

Calculation of EPS

Particulars	Financial Plan	
	Alternative 'A' (₹)	**Alternative 'B' (₹)**
EBIT	1,50,000	1,50,000
Less: Interest	---	50,000
EBT / or PBT	**1,50,000**	**1,00,000**
Less: Tax at 50%	75,000	50,000
EAT	**75,000**	**50,000**
Less: Preference dividend	---	---
Earnings available to share holders.	**75,000**	**50,000**
No. of shares (existing + new)	(1,00,000 + 50,000)	(1,00,000 + 0)
EPS = Earnings available to shareholders / No. of equity shares	**75,000 / 1,50,000 = 0.5**	**50,000 / 1,00,000 = 0.5**

Task "As the debt-equity ratio increases, there is a trade-off between the interest tax shield and bankruptcy, causing an optimum capital structure." Do you agree with the statement? Give reasons.

Caselet

Rajart and Associates — Financial Alternatives

This case provides the opportunity to match financing alternatives with the needs of different companies. It allows the reader to demonstrate a familiarity with different types of securities.

George Thomas was finishing some weekend reports on a Friday afternoon in the downtown office of Wishart and Associates, an investment-banking firm. Meenda, a partner in the firm, had not been in the New York office since Monday. He was on a trip through Pennsylvania, visiting five potential clients, who were considering the flotation of securities with the assistance of Wishart and Associates. Meenda had called the office on Wednesday and told George's secretary that he would cable his recommendations on Friday afternoon. George was waiting for the cable.

George knew that Meenda would be recommending different types of securities for each of the five clients to meet their individual needs. He also knew Meenda wanted him to call each of the clients to consider the recommendations over the weekend. George was prepared to make these calls as soon as the cable arrived. At 4:00 p.m. a secretary handed George the following telegram.

George Thomas, Wishart and Associates STOP Taking advantage of offer to go skiing in Poconos STOP Recommendations as follows: (1) common stock, (2) preferred stock,

Contd...

Notes

(3) debt with warrants, (4) convertible bonds, (5) callable debentures STOP. See you Wednesday STOP Meenda.

As George picked up the phone to make the first call, he suddenly realized that the potential clients were not matched with the investment alternatives. In Meenda's office, George found folders on each of the five firms seeking financing. In the front of each folder were some handwritten notes that Meenda had made on Monday before he left. George read each of the notes in turn.

APT, Inc, needs $8 million now and $4 million in four years. Packaging firm with high growth rate in tri-state area. Common stock trades over the counter. Stock is depressed but should rise in year to 18 months. Willing to accept any type of security. Good management. Expects moderate growth. New machinery should increase profits substantially. Recently retired $7 million in debt. Has virtually no debt remaining except short-term obligations.

Sandford Enterprises

Needs $16 million. Crusty management. Stock price depressed but expected to improve. Excellent growth and profits forecast in the next two year. Low debt-equity ratio, as the firm has record of retiring debt prior to maturity. Retains bulk of earnings and pays low dividends. Management not interested in surrendering voting control to outsiders. Money to be used to finance machinery for plumbing supplies.

Sharma Brothers., Inc.

Needs $20 million to expand cabinet and woodworking business. Started as family business but now has 1200 employees, $50 million in sales, and is traded over the counter. Seeks additional shareholder but not willing to stock at discount. Cannot raise more than $12 million with straight debt. Fair management. Good growth prospects. Very good earnings. Should spark investor's interest. Banks could be willing to lend money for long-term needs.

Sacheetee Energy Systems

The firm is well respected by liberal investing community near Boston area. Sound growth company. Stock selling for $16 per share. Management would like to sell common stock at $21 or more willing to use debt to raise $ 28 million, but this is second choice. Financing gimmicks and chance to turn quick profit on investment would appeal to those likely to invest in this company.

Ranbaxy Industry

Needs $25 million. Manufactures boat canvas covers and needs funds to expand operations. Needs long-term money. Closely held ownership reluctant surrender control. Cannot issue debt without permission of bondholders and First National Bank of Philadelphia. Relatively low debt-equity ratio. Relatively high profits. Good prospects for growth. Strong management with minor weaknesses in sales and promotion areas.

As George was looking over the folders, Meenda's secretary entered the office. George said, "Did Meenda leave any other material here on Monday except for these notes?".

She responded, "No, that's it, but I think those notes should be useful. Meenda called early this morning and said that he verified the facts in the folders. He also said that he learned nothing new on the trip and he sort of indicated that, he had wasted his week, except of course, that he was invited to go skiing at the company lodge up there".

Contd...

Notes

George pondered over the situation. He could always wait until next week, when he could be sure that he had the right recommendations and some of the considerations that outlined each client's needs and situation. If he could determine which firm matched each recommendation, he could still call the firms by 6:00 P.M. and meet the original deadline. George decided to return to his office and match each firm with the appropriate financing.

Questions

1. Which type of financing is appropriate to each firm?
2. What types of securities must be issued by a firm which is on the growing stage in order to meet the financial requirements?

8.12 Summary

- Capital structure refers to the mix of long-term sources of funds, such as equity shares capital, reserves and surpluses, debenture, long-term debt from outside sources, and preference share capital.
- Capital structure = Long-term debt + Preferred stock + Net worth or capital structure = Total assets – Current liabilities.
- In financing decisions the financial manager's job is to come out with an optimum capital structure, which maximizes market value per share by minimizing cost of capital.
- An appropriate capital structure should take into consideration profitability, solvency, flexibility of capital structure, firm's debt capacity, and control.
- The construction of capital structure is difficult, since it involves a complex trade off among several factors.
- Appropriate capital structure can be determined by adopting: EBIT-EPS approach, valuation Approach and cash flow approach.
- Indifference point is that EBIT level at which, the EPS is same for two alternative capital structures.
- According to the NI approach overall cost of capital continuously decreases as and when the debt content is increased in the capital structure. So optimum capital structure exists when the firm borrows maximum.
- NOI is just opposite to NI approach and argues that capital structure is irrelevant. According to the theory, K_o depends on business risk, which is assumed to be constant. So, K_o does not change when leverage is changed.
- The MM approach to capital structure is akin to that of NOI approach and argues that capital structure is irrelevant.

8.13 Keywords

Arbitrage: It refers to an act of buying a security in one market having lower price and selling it in another market at higher price.

Capital Structure: It is that part of financial structure, which represents long-term sources.

EBIT-EPS Approach: This approach determines the impact of debt on earnings per share.

MM Theory: According to this theory the value of the firm is independent of its capital structure.

Notes

Net Income Approach: According to this approach, the cost of debt and the cost of equity do not change with a change in the leverage ratio.

NOI Approach: According to this approach, the market value of the firm is not affected by the capital structure changes.

Optimum Capital Structure: It is that capital structure where market value per share is maximum and the cost of capital is minimum.

WACC Approach: It is midway between NI and NOI approaches.

8.14 Review Questions

1. Critically analyse the differences between capital structure and financial structure.
2. From the following information determine optimal capital structure by the calculation of cost of capital.

Particulars	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7
Debt as a percentage of total capital	0	0.1	0.2	0.3	0.4	0.5	0.6
Debt cost (K_d %)	6	6	6	6.5	7	7.5	8.5
Equity cost (K_e %)	14	14	14.5	15	16	18	19

3. Analyse the different forms of capital structure.
4. It is proposed to start a business and so required a capital of ₹ 10 lakh and an assured return of 15 per cent on investments. Calculate EPS if:
   (a) Total capital required, by way of ₹ 100 equity
   (b) If 50 per cent of equity capital and 50 per cent, 10 per cent debentures.
5. Elucidate the relationship between the leverage & cost of capital according to the NI & NOI approach.
6. Calculate EBIT. Interest ₹ 5,0000; sales ₹ 50,000; Variable cost ₹ 25,000; Fixed cost ₹ 15,000.
7. List down the approaches available to determine the capital structure of the firm.
8. Critically analyze the different theories of capital structure.
9. From the following information calculate EPS.

Particulars	Venkat Ltd (₹ in lakh)	Sai Ltd (₹ in lakh)
Equity (shares of Rs. 10 each)	200	100
Debentures at 12 %	-	100
Assets	100	200

   Calculate EPS assume (a) 20 per cent before tax rate of return of assets, (b) 10 per cent before tax return on assets; company is in 50 per cent tax bracket.
10. Elucidate the procedure for EBIT-EPS analysis.
11. 'There is nothing like optimum capital structure for a firm'. Critically evaluate the statement.
12. Penta Four Ltd., has currently adopted an all equity structure, consisting of 15,000 equity shares of ₹ 100 each. The management is planning to raise another ₹ 25 lakh to finance a major expansion programme and is considering three alternative methods of financing.
    (a) To issue 25,000 equity shares of ₹ 100 each.

Notes

(b) To issue 25,000, 8% debentures of ₹ 100 each.

(c) To issue 25,000, 8% preference shares of ₹ 100 each.

The company's expected EBIT will be ₹ 8 lakh. Assuming a corporate tax rate of 46 percent. Determine the EPS in each financial plan and determine the best one and why?

13. What basic principles will you advocate in the matter of deciding on a proper constitution of capital structure for a firm?
14. Comment on the flexibility in the capital structure.
15. Examine the importance of the optimum capital structure of a firm & the ways in which one can deduce it.

Answers: Self Assessment

1.	T	2.	F
3.	T	4.	T
5.	F	6.	wealth maximization
7.	Flexibility	8.	Equity
9.	Debt finance	10.	capital structure
11.	T	12.	F
13.	F	14.	T
15.	T	16.	T
17.	F		

8.15 Further Readings



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Unit 9: Dividend Decisions

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Objectives

After studying this unit, you will be able to:

- Explain the meaning of dividend policy of management of profits;
- Discuss the different types of dividend policies, advantages and dangers of stable dividend policy;
- Understand the factors that influence a firm's dividend policy.

Introduction

Finance is the lifeblood of business, without which a firm cannot promote, maintain and expand and achieve its predetermined objective. Whether it is big, medium or small it needs finance. Profit is the primary motivating force for any economic activity, a business enterprise essentially being an economic organization, it has to maximize the welfare of its stakeholders. To this end, the business undertaking has to earn profit from its operations. Profit is the excess of revenue over expenses on conducting operations. In fact, profits are useful intermediate beacon towards which a firm's capital should be directed. In this connection McAlpine rightly remarked that profit cannot be ignored since it is both, a measure of the success of business and the means of its survival and growth. To quote Bradly, "if an enterprise fails to make profit, capital invested is eroded and if this situations, prolongs the enterprise ultimately ceases to exist." A well organised profit planning program will help towards maintaining a level of profit, which will ensure the concentration of the business and fulfillment of other responsibilities. Certainly, profit growth coupled with high level of profit and the ability to maintain reasonable profit will help towards:

(i) Ensuring that shareholders receive an adequate dividend;

Notes

(ii) Preserving the assets worth of the business;

(iii) Generating a sufficient cash flow out of profits to provide capital for expansion; and

(iv) Providing funds for research, and development of new and improved products to replace the existing products before they decline.

9.1 Management of Profits

From the point of view of dividend decision it is better to call management of profits as management of earnings. Earnings mean net earnings available to equity shareholders from where a firm actually declares dividends or retain profits for financing of investment opportunities.

Net earnings = Operating Profit – (Interest + Tax + Preference Dividend)

Management of earnings means, how the earnings of a firm are determined and how they are utilized or appropriated or allocated or distributed. In other words, how the business firm apportions their earnings is between dividends and retentions for financing of investment opportunities. Retention of earnings' is also known as plough back of profits. Management of earnings is an important finance activity of a business undertaking. Since proper management of earnings helps to maximise shareholder's wealth particularly in Joint Stock companies where owners are different from the management team, who are selected/appointed by owners, usually management team or Board of Directors (BODs) do not distribute the total net earnings to the shareholders as dividends. They may retain a part of it for financing of investment opportunities or expansion program by keeping future growth of the firm in mind. Management of earnings policy must maximize value of the firm, thereby maximize benefits to its owners. On the other hand improper retained earnings and absence of financial control measures are the indicators of inefficient management of earnings that may not help to maximize value of the firm, but they may lead to the liquidation of the company.

9.2 Dividend Policy

As we have seen in the above, management of earnings means allocation of earnings among dividends and plough of profits. The term 'dividend' refers to that portion of company's net earnings that is paid out to the equity shareholders (not for preference shareholders, since they are entitled to have a fixed rate of dividend). Dividend policy of a firm decides the portion of earnings is to be paid as dividends to ordinary shareholders and the portion that is ploughed back in the firm for investment purpose. The total net earnings of equity may be paid as dividends (100% dividend payout ratio), which may consequently result in slower growth and lower market price or a part of net earnings may be paid as dividends, higher capital gains and higher market price. When a company uses a part of its net earnings for dividend payments then, the remaining earnings are retained. Thus, there is an inverse relationship between retained earnings and payment of cash dividend-the larger the cash dividends and lesser the retention, smaller the cash dividends and larger retentions. Hence, the alternative use of net earnings or net profit dividends and retained earnings are competitive and conflicting.

Dividend decision affects the value of the firm. The cash available for the payment of dividends is affected by the firm's investment decision, and financing decision. A decision, which is related to investment leads to less cash available for payment of dividends. Thus, there is a relation between investment decision and financing decision. Distribution of net earnings between dividends and retention would obviously affect owners' wealth. Now the company is in dilemma which alternative is consistent to maximize shareholders wealth. The firm has to pay dividends to shareholders if dividends lead to the maximization of wealth for them, otherwise the company should retain them for financing profitable investment opportunities.

9.3 Types of Dividend Policies

Notes

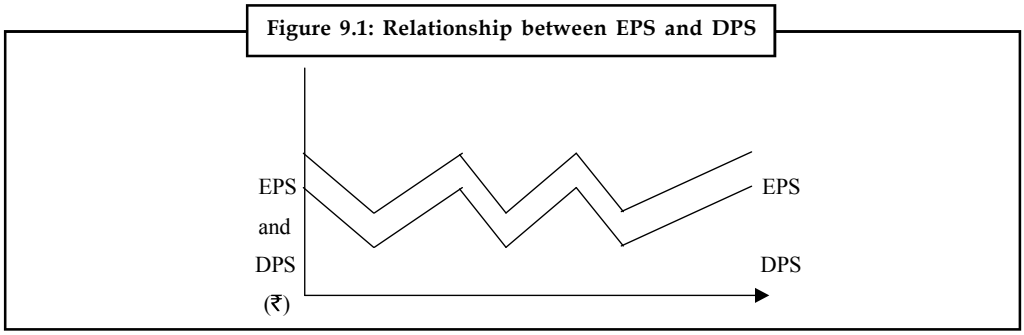
Dividend decision of a firm is taken after taking into consideration, its operating and financial condition. When there are variations in these conditions the firm may require to adopt the one that is suitable for the present conditions. What are the different types of dividend policies available to the financial manager? The different types of dividend policies are as follows:

Stable Dividend Policy: The term "stability" refers to the consistency or lack of variability in the stream of dividend payments. In more precise terms, stable dividend means payment of a certain minimum amount of dividend regularly. There are three distinct forms of stability, they are:

(a) ***Constant Dividend per Share:*** A company that follows this policy will pay a fixed amount per share as dividend. For example ₹ 2 as a dividend on the face value of share of ₹ 10 each. The level of earnings would not affect this policy or the dividend payments. This type of dividend policy is more suitable for the company whose earnings are stable over a number of years. Stability of dividend does not mean stagnation in dividend payout. In fact, the prime feature of this policy is to study positive change.

(b) ***Constant Payout Ratio:*** The ratio of dividend to earnings is known as payout ratio. In other words, dividend per share is divided by earnings per share to get dividend payout ratio. It is also known as constant percentage of net earnings. In this policy a fixed percentage of earnings are paid as dividends each year. Here the ratio is fixed or constant, but dividend per share varies according to the fluctuations in the earnings. For example, it a company follows a 30 per cent payout ratio it means for every one rupee of net earnings, ₹ 0.30, paid as dividends. Assume if a company earned ₹ 10 last year and ₹ 15 in the current year. Then the dividend amount for last year is ₹ 3 (10 × 30/100) and ₹ 4.5 (15 × 30/100) for the current year. The relationship between EPS and DPS is shown in Figure 9.1.

Figure 9.1: Relationship between EPS and DPS



This policy is suitable for a company that is not confident getting stable earnings.

(c) ***Stable Rupee Dividend Plus Extra Dividend:*** Under this policy the management fixes the minimum dividend per share to reduce the possibility of net paying dividend. An extra dividend is paid in the years of prosperity. This type of policy is more suitable to the company having minimum earnings and over the minimum, the earnings may fluctuate.

9.3.1 Advantages of Stable Dividend Policy

A stable dividend policy is advantageous for both the company and the shareholders because:

1. ***Building Confidence among Investors:*** Payment of stable dividends may help the company in creating and building confidence among shareholders with regard to regularity. A company that follows stable dividend policy will not change the amount of dividends,

Notes

even though there are any variations in its earnings. Thus, when the earnings of a firm go down, the company does not cut the amount of dividend. But to its presents investors, a very bright future, and thus, gains confidence of the shareholders.

2. ***Investors Desire for Current Income:*** A company may have many investor categories, of them a few groups of investors depend on dividend income to meet their portion of living expenses. Investor group may include old and retired persons etc., who require the current income. Their living expenses are fairly stable from the period to period increase over time. Therefore, sharp changes in dividend income may create a need to sell shares to get funds in order to meet current expenses and vice versa. Sale of securities involves inconvenience and it involves transaction costs. Stable dividend policy avoids sale of securities, which automatically avoids inconvenience and transaction cost, hence, such investors may prefer stable dividends.

3. ***Information about Firms Profitability:*** There is another reason for adopting a stable dividend policy that is, investors are thought to use dividends and the fluctuation in dividends as a source of information about the company's profitability. A growth in dividends indicates improved earnings prospects, a downward trend in dividends implies less earnings and stable dividends means unchanged prospects. In other words, the dividend decision of a firm resolves uncertainty in the minds of investors. Variation in dividend policy cannot resolve uncertainty in the investor minds. Hence, companies may tries to change dividend policy in response to a certain long-term changes in future prospects.

4. ***Institutional Investors Requirements:*** Companies shares are not only purchased by individuals but also institutional investors like LIC companies, GIC's, MF's, educational institutes and social institutes. Normally, companies are very much interested to have these institutional investors in the list of their investors. Generally, this type of institutional investors have large size of their ingestible funds, these funds will be invested in the shares of those companies that have the record of paying stable dividends. So, to attract institutional investors a firm may prefer to adopt a regular or stable dividend policy.

5. ***Raising Additional Finances:*** This is another advantage to the company that is following a stable dividend policy, in raising external finance. Shares of this type of company appear as investment rather than a speculation. Investors, who invest in this type of company's shares hold them for a long period of time and their loyalty and goodwill towards the firm increase by adoption of stable dividend policy. If the company wants to raise additional funds by issuing shares to the public, they would be more receptive to that offer. For example recently in beginning of the year 2004, the public issue of ONGC, ICICI, IPTCL, GAIL is oversubscribed. Thus, rising of additional funds required by the firm becomes very easy, even with high premium.

6. ***Stability in Market Price of Shares:*** Other things remains unchanged, the market price of shares varies with the stability in dividend rates. The share price of a firm having stable dividend policy may not have wide fluctuation on even if the earnings of the firms less than the past year. Thus, this is good for investors and the company.

7. ***Easy Availability of Debt Funds:*** If the company feels raising additional funds by issue of equity shares, leads to loss of control over the firm, it can easily raise funds from debt source. Because, the firm has been paying dividends regularly with stability, it becomes an assurance to the debenture holders, financial institutions and public (to invest in public deposits).



Task List the various advantages of stable dividend policy.

Notes

9.3.2 Limitations of Stable Dividend Policy

In spite of the above discussed advantages the stable dividend policy suffers from certain limitations. They are:

(a) ***Difficult to Change:*** Once a stable dividend policy is established, it cannot be changed without affecting investors' attitude and financial position of the company, in the minds of investor.

(b) ***Adverse Effect on Market Price of Share:*** As we have discussed in the advantages, about the investors desire for current income to meet their living expenses, the investors who prefer or depend on stable dividends, may feel bad, when the firm cuts dividend, consequently they may sell some of their shares to fulfill the gap between expected dividend and the actual dividend received (negative dividend). This leads to the reduction in the share price. Hence, directors have to maintain stability in dividends, in lean years.

(c) ***Long-Run Effect on Company:*** When a firm maintains stable dividend policy in lean years over a period of time with borrowed funds it may lead to death in the long-run.

Self Assessment

Fill in the blanks:

1. Dividend refers to that portion of companies …… that are paid out to the equity shareholders.
2. Distribution of profits between dividends and retained earnings affects the …… of the firm.
3. Dividend policy of a firm affects both …… and owners' wealth.
4. Investors' desire for current income is one of the advantages of …… policy.

9.4 Factors Influencing Dividend Policy

Maximization of owners' wealth is the objective of the financial manager's job. Whatever decision he/she takes, whether it is investment decision, financing decision or dividend decision, he/she has to maximize value of the firm. There is a positive relation between dividend policy of a firm and value of the firm that is payment of dividend affects the value (increases) of the firm. Dividend policy means, the formation of a policy by the company regarding the payment of dividend from profits to ordinary shareholders year to year. It determines the ratio between dividend and retained earnings. Then, what type of dividend policy do firms adopt? Whether it is 20 per cent, or 40 per cent or 80 per cent or any other percentage of earnings available to shareholders? The two important dimensions of dividend policy are, what should be the dividend payout ratio? How stable should the dividends be over time?

The policy relating to dividend payout ratio and earnings retention varies not only from industry to industry but also among companies within a given industry and within a company from time to time. These variations are because of factors influencing/affecting dividend policy. But financial executives have to make a balanced judgment between the financial needs of the company and desires of the shareholders. In other words, financial executive have to determine optimum dividend policy that should strike the balance between current dividends and future growth which maximizes the price of the firm's shares.

Notes



Notes The dividend payout ratio of a firm should be determined with reference to two objectives - first maximization of shareholders' wealth and second providing sufficient funds to finance growth. The determinants of dividend policy will vary from firm to firm.

The following are the various factors that have a bearing on the dividend policy:

1. ***Nature of Business:*** The nature of business has an important bearing on the dividend policy. The industrial units that are having stability of earnings may formulate (adopt) stable or a more consistent dividend policy than other, that are having unstable earnings, because they can predict easily their earnings. Firms that are involved in necessities suffer less from stable incomes than the firms that are involved in luxury goods. The industries/ firms that are having stable earnings can adopt stable or high dividend policy, while the other firms that are having instable earnings should follow a variable or low dividend policy.

2. ***Age of Company:*** The age of company has more impact on distribution of profits as dividends. A newly started and growing company may require much of its earnings for financing expansion programs or growth requirements and it may follow rigid dividend policy, where in, most of the earnings are retained while an old company with good track record and good name in the public can formulate a clear cut and more consistent dividend policy. This type of companies may even pay 100 per cent dividend payout ratio and the required amount for growth can be raised from the public.

3. ***Liquidity Position of Company:*** Generally dividends are paid in the form of cash, hence, it entails, cash. Although, a firm may have sufficient profits to declare dividends, but it may not have sufficient cash to pay dividends. Thus, availability of cash and sound financial position of the firm is an important factor in taking dividend decision. The liquidity of a company depends very much on the investment and financial decisions of a firm, while in turn determining the rate of expansion and the manner of financing. If cash position of a firm is weak, stock dividend will be better and if cash position is good it can go for payment of dividend by cash.

4. ***Equity Shareholders Preference for Current Income:*** Legally, the Board of Directors has discretion to decide the distribution of the earnings of a firm. The shareholders who are legal owners of the firm appoint the (BODs). Hence, directors have to take into consideration owners' preferences, while deciding dividend payment. Shareholders' preference for current dividends or capital gains, that is, depend on their economic status and the effect of tax differential on dividends and capital gains. When shareholders' have more preference in current dividend than capital gains, the firm may be required to follow liberal dividend policy, on the other hand if shareholders have preferred capital gains (it may be due to tax or economically sound) than the current dividend, then the firm may be required to retain more earnings.

5. ***Requirements of Institutional Investors:*** Institutional investors like LICs, GICs and Mutual Funds (UTI), have investment policy, which says that these type of institutes have to invest only in companies that have a continuous dividend payment record with stability. These purchase large blocks of shares for relatively, to hold a long period of time. Hence, they represent a significant force in the financial markets, and their demand for company's securities may increase the share price and there by owners' wealth. To attract institutional investors firms may require to follow stable dividend policy. Apart from theoretical postulates for the desirability of stable dividends, there are also many empirical studies,

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classic among them being that of Lintner, to support the viewpoint that companies pursue a stable dividend policy. Most firms are in favor of stable dividend per share but they are very careful not to raise dividends per share a level that can safely be sustained in, the future. This cautious creep up of dividends per share results in stable dividend per share pattern during fluctuating earnings per share periods, and a rising step function pattern of dividends per share during increasing earnings per share periods.

6. ***Legal Rules:*** Legal rules restrictions are significant as they provide framework within which dividend policy is formulated. In other words, dividend policy of a firm has to be evolved within the legal framework and rules and regulations. The legal rules have to do with capital impairment rule, net profits and insolvency rule.

   Capital Impairment Rule: First these provisions require that, the dividend can be paid from earnings either from current year's earnings or from past years earnings and be reflected in the earned surplus. If firm pays dividend out of capital that adversely affects the security of its lenders. The purpose of this rule is to protect creditors (preference shareholders and creditors of the firm) by providing sufficient equity base because they have originally relied on that base. Therefore, the financial manager should keep in mind the legal rules while declaring dividends.

   Net Profits: This rule is essentially a result of the earlier rule. A firm can pay cash dividends within the limits of current profits plus accumulate balance of retained earnings. According to Sec. 205 of the Companies Act, 1956, dividends shall be declared or paid only from current profits or past profits after recovery of depreciation'. But Central Govt. is empowered to all (only in public interest) any company to pay dividends for any financial year out of profits of the company without providing depreciation. A firm can take profits of past years if the current year's profits are not sufficient to maintain stable dividend policy. If there are any losses that are to be carried forward, they should be set apart from current year's earnings before declaration of dividends. So financial manager has to strong within the boundaries, at the same time has to consider many financial variables and constraints in deciding the amount that is to be paid as dividends.

   Insolvency Rule: A firm is said to be insolvent in two cases. One, in a legal sense, the recorded value of liabilities exceeding the recorded value of assets, or two, as in a technical sense, as the firm's inability to pay its creditors as obligations came due. If the firm is insolvent in either sense, it is prohibited the payment of dividends. The rationale of this rule is to protect the creditors.

7. ***Contractual Requirements:*** Generally lenders may put conditions in a bond indenture or loan agreement often includes a restriction of the payment of dividend. This is done to protect their interests when the firm is experiencing low liquidity or profitability. The restrictions may be in three forms. Firstly, firms may be prohibited from paying dividends in excess to a certain percentage say 10 per cent. Secondly, a ceiling in terms of net profits that may be used for dividend payment may be laid down. Say only 50 per cent of net profits or a given absolute amount of net profits can be paid as dividends. Finally, dividends may be restricted by insisting upon a minimum of earnings to be retained. Reinvestment reduces debt equity ratio, which enhances the margin of pillow for the lenders. Therefore, keeping in mind all the restrictions of lenders dividend declaration should be done.

8. ***Financial Needs of the Company:*** This is one of the key factors, which influence the dividend policy of a firm. Financial needs means funds required for foreseeable future investment. The required funds may be determined with the help of long-term financial forecasts. A firm that has sufficient profitable investment opportunity, should follow low dividend payout ratio. On the other hand, a firm that has no profitable investment opportunities or

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few investment opportunities adopts high dividend payout ratio policy (that low retention) because owners can reinvest dividends elsewhere at higher rate of return then the firm can do, and nominal retention of profit is required to replace the modernize firm's assets.

9. ***Access to the Capital Market (External Sources):*** Access to the capital market means the firm's ability to raise funds from the capital market. A company, which has easy access to the capital market provides that flexibility in deciding dividend policy. Easy access is possible only to the companies that are well established and hence here a profit track record. Generally dividend policy and investment decisions are interrelated, but in this situation they are independent. The management may tempt to declare a high rate of dividend that attract investors and maintain existing shareholders.

   On the other hand, a firm that has difficulty in accessing capital market to raise required funds, will not be able to pay more dividends. It has to depend on internal funds, so management should follow a conservative dividend policy by maintaining a low rate of dividend and plough back a sizeable portion of profits to face any contingency. Likewise, the lending financial institutions advance loans in stiffer terms, it may be desirable to rely on internal sources of financing and accordingly conservative dividend policy should be pursued.

10. ***Control Objective:*** Control over the company is also an important factor, which influences dividend policy. When a firm distributes more earning as dividends in the form of cash it reduces its cash position. As a result, the firm will have to issue shares to the public to raise funds required to finance investment opportunities that leads to loss of control, since, the existing shareholders will have to share control with new owners. Financing investment projects by way of internal source avoids, loss of control. Hence, if the shareholders and management of the firms are reluctant to dilution of control, thus the firm should retain more earnings for investment programmes, by following conservative dividend policy.

11. ***Inflation:*** Inflation is the state of economy in which the prices of products or goods have been increasing. Inflation is a factor that influences dividend policy indirectly. Indian accounting system is based on historical costs. The funds accumulated from depreciation may not be sufficient to replace the absolute asset or equipment, since depreciation is provided based on historical costs. Consequently, to replace assets and equipment, firm has to depend upon retained earnings, this leads to the payment of low dividend, during inflation period.

12. ***Dividend Policy of Competitors:*** Keeping one eye on competitors' dividend policy is very important. If the firm wants to retain the existing shareholders or it want to maintain share price in the market, and if it is planning to raise funds from public for expansion programs, it has to pay dividends at par with its competitors. Hence, it is one of the factors that influence dividend policy of a firm.

13. ***Past Dividend Rates of the Company:*** This is the factor that influences the dividend policy of an existing company (that has already paid dividends). Owners' and prospective investors prefer stability in dividends. Stability of dividends means the payment of dividend regularly, at a constant dividend per share (it may be a fixed percentage on book value or a fixed percentage on earnings available to equity shareholders). Generally firms' tries to maintain stability in dividends that is based on past dividend rates of the company. Hence, directors will have to keep in mind the past dividend rates.

14. ***Others:*** Apart from the above discussed, there are some other factors, which influence dividend policy of a firm, such as Trade Cycles, Corporate taxation policy, attitude of investors group and repayment of loan.

Self Assessment

Notes

State whether the following statements are true or false:

5. Dividend decision involves legal as well as financial considerations.
6. Capital impairment rule says that dividends can be paid from capital.
7. Sec 205 of the Companies Act , 1956 says that dividends can be declared only from current year's profits or from past reserves after providing depreciation.
8. Payment of dividend is prohibited when the firm is insolvent.
9. Stock dividend affects the liquidity position of the firm.
10. There is no relation between financing decisions and dividend decision.
11. Management of earnings has nothing to do with retention of profits.
12. Ploughing back of profits is the same as self-financing.
13. Bonus issue amounts to reduction in the amount of accumulated profits and reserves.
14. Reduction in the number of outstanding shares is known as reverse split.

9.5 Forms of Dividends

Dividend is the portion of earnings available to equity shareholders that equally (per share bias) is distributed among the shareholders. General practice is to pay dividends in cash, this form may take place when the cash is available or during liquidity of the company. Sometimes firms may declare dividends in the form of Scrip, bond, stock and property dividends. The following discussion deals with the different forms of dividends:

1. ***Cash Dividend:*** Generally many companies pay dividends in the form of cash. But payment of dividend in the form of cash requires enough cash in the bank or in hands. In other words, there should not be any shortage of cash for payment of dividends. Sufficient cash is available only when a company prepares cash budget to estimate the required amount for the period for which the budget is prepared. If the company finds any shortage of cash, it should make arrangements to borrow funds. But it may be difficult to prepare a cash budget with the expected amount needed for payment of dividends.
2. ***Scrip Dividend:*** In this form of dividends, the equity shareholders are issued transferable promissory notes for a shorter maturity period that may or may not be interest bearing. It is a simple payment of dividends in the form of promissory notes. Payment of dividend in this form takes place only when the firm is suffering from shortage of cash or weak liquidity position.



Notes Payment of dividends in the form of cash is justifiable only when the company has earned profits and it will take some time to convert current assets into cash.

3. ***Bond Dividend:*** Both scrip dividend and bond dividend are same, but they differ in terms of maturity. Bond dividends caries longer maturity whereas, scrip dividend has shorter maturity. The effect of both forms of dividends on the company is the same. Bond dividend bears interest.
4. ***Property Dividend:*** The name itself suggests that payment of dividend takes place in the form of property. In other words, payment of dividends in the form of assets. This form of

Notes

dividends takes place only when a firm has assets that are no longer necessary in the operation of business and shareholders are ready to accept dividend in the form of assets. This form of dividend payment is not popular in India.

5. ***Stock Dividend (Bonus Shares):*** Stock dividend is the payment of additional shares of common stocks to the ordinary shareholders. In other words, distribution of bonus shares to the stockholders instead of cash dividend. It is known as stock dividend in USA to the existing shareholder. Bonus shares are shares issued to the existing shareholders as a result of capitalisation of resources. The declaration of bonus shares will increase the paid up share capital and reduces retention of earnings. But there would not be any change in net worth. Issue of bonus shares increases the number of outstanding shares. Distribution of bonus shares is done proportionately. Payment of dividend in the form of bonus share does not affect the wealth of owners', since earnings per share and market price per share will fall proportionately. When there is no wealth maximisation why do firms pay dividend in the form of bonus shares?

Self Assessment

Fill in the blanks:

15. Making share trading attractive is one of the reasons of …… .
16. Dividend warrants must be posted within …… days.
17. …… is the payment of additional shares of common stock to ordinary shareholders.
18. …… promises to pay the shareholders at a future date.
19. Usual forms of paying dividend is…… .
20. The issue of bonus shares amounts to a corresponding increase in the …… of a firm.

9.6 Mathematical Approaches for Dividend Decisions

A few models, which studied the relationship between the dividend policy and the equity returns, are given below:

Walter's Model

Walter's Model supports the doctrine that dividends are relevant. The investment policy of a firm cannot be separated from its dividend policy and both are, according to Walter, interlinked. The choice of an appropriate dividend policy affects the value of an enterprise.

The relationship between dividend and share price on the basis of Walter's formula is shown below:

$$V_c = \frac{D + R_a / R_c (E - D)}{R_c}$$

Where,

V_c = Market value of the ordinary shares of the company

R_a = Actual capitalization rate

R_c = Normal capitalization rate expected by the investors

Notes

E = Earnings per share

D = Dividend per share

Analyzing the Walter Formula:

$$\text{We know that the value of share} = \frac{\text{EPS (Earnings per share)}}{\text{Capitalization rate}}$$

$$= \frac{\text{Divident + Retained Earnings}}{R_a}$$

The Walter formula gives an added weight to the retained earning portion of the earnings formula. The factor is placed in front of retained earnings to change its weighted value under three different situations as follows:

1. If R_a/R_c is greater than I i.e., the firms earnings are more than the norm. In this situation we want the firm to retain its earnings since other alternative investment offer a lower return than the firm is about to secure.

Example: A firm has EPS ₹ 5 and pay dividend of ₹ 2. Its actual capitalization rate is 15% and normal capitalization rate is 10%. What is the value of the firm using capitalization earnings and Walter formula?

Capitalization earnings = Value = ₹ 5/10% = ₹ 50

$$\text{Walter formula value} = 2 + 2 + 2 + \frac{15}{10} \times (5 - 2) = \frac{6.5}{10\%} = ₹\ 65$$

2. R_a/R_c is equal to I, when the actual and normal capitalization rates are identical. In this case, the retained earnings have the same weighted value as dividends and the Walter Formula gives the same value as the Capitalization Earnings formula.

3. R_a/R_c is less than I i.e., retained earnings have a lower weight than dividends. Thus less the firm retain, the higher its value. In the above example, if the capitalization (actual) is 5%.

Value of the firm Capitalization of earnings 5/10% = ₹ 50

$$\text{Value of the Firm Walter formula} = 2 + 5/10 \times \frac{(5 - 2)}{10\%} = \frac{3.5}{10\%} = ₹\ 35$$

Assumption of the Walter Model

1. Retained earnings are the only source of finance available to the firm, with no outside debt or additional equity used.
2. R_a and R_c are assumed to be constant and thus additional investments made by the firm will not change its risk and return.

Profiles

1. Firm has an indefinite life.
2. For a given value of the firm, the dividend per share and the earnings per share remain constant.

Limitations of the Walter Model

1. Exclusive financing by retained earnings make the model suitable only for all equity firms.

Notes

2. The assumption that the return on investment remains constant will not be true for firms making high investments.

3. It ignores the business risk of the firm, which has a direct impact on the value of the firm.



Example: Illustrate approaches to dividend decisions using Walter Model: Let us consider a firm with ₹ 4 earnings per share and ₹ 3 current dividend. The firm is currently selling for ₹ 22 per share and thus has an actual capitalization rate of 4/22 or 18%. The normal capitalization rate for the industry is 12 per cent. The firm has a need for cash and is considering lowering the dividend to ₹ 2 per share. What effect would this have on the value of common share by using Walter Model?

Solution:

$$\text{₹ 3 dividend} = \frac{3 + 18/12 \times 1}{.12} = \frac{4.5}{.12} = \text{₹ } 37.5$$

$$\text{₹ 2 dividend} = \frac{2 + 18/12 \times 2}{.12} = \frac{5}{.12} = \text{₹ } 41.67$$

Gordon's Dividend Capitalization Model

Another model that has given importance to dividend policy of the firm is the Gordon Model. Gordon Model assumes that future dividends are the sole determinant of the intrinsic value of the common shares.

The model may be written:

$$\text{Value of the share} = \frac{\text{Div. Curr.}}{CR_{norm} - (CR_{act})\ (\%\ RE)}$$

Where

Div. Curr = Current Dividend in rupees (annual basis)

CR_{norm} = Capitalization rate demanded by the market for the stock of the type.

CR_{act} = Actual capitalization rate based on the firms current earnings (provided they are relatively normal) and current market price.

%RE = Percentage of Future earnings, the firm is likely to retain.

The dividend growth model shows the value of a share as the shares current dividend divided by the amount that the demanded profit exceeded the rate of growth in the dividend, stated graphically. The model shows value as:

$$\text{Value of the share} = \frac{\text{Current dividend}}{\text{Demanded after tax profit} > \text{dividend growth}}$$



Example: If a firm has a 10% actual capitalization rate, a dividend payout of 40% and declares a Re. 1 dividend in 2005. What is the growth rate? What is the likely stream of dividends through 2009? If the firm is in industry with a 12% normal capitalization rate, what is the intrinsic value using the dividend growth model?

Solution: Multiplying the actual capitalization rate by the percentage of retained earnings gives the growth rate in dividend per share, assuming no change in dividend payout.

Notes

The firm retains a 60% share of the 10% post-tax profits for a 6% growth rate. The stream of dividend payments at a 6% growth rate is as follows:

$$\text{Value of the share} = \frac{1}{12\% - (10\%)(60\%)} = \frac{1}{0.06} = ₹ 16.67$$

Factors Incorporated in the Dividend Growth Model

1. ***Restriction of the shareholders' return to a single variable:*** In this model the income factor is limited to the current dividend earnings retained in the firm are part of the growth factor that will operate to increase the current dividend, but only the dividend and its expected increases are considered as a return.
2. ***Inclusion of two capitalization rates:***
   (a) *Normal Capitalization Rate (CR_{norm}) i.e., reciprocal of PE ratio:* If the firm is not able to achieve such a return at the existing market price, shareholders will sell their shares, thus depressing the market price and raising the rate of return.
   (b) *Actual Capitalization Rate:* The firm's actual capitalization rate is the relationship of its actual EPS to the market price of its stock. This is an important factor influencing growth. A firm with higher profits will have more funds to retain and hence more money to finance growth, as compared with firms with lower profits.
3. ***Inclusion of a growth factor:*** In common shares valuation, we are primarily concerned with firm's growth financed from retained earnings. We eliminate the sources of funds for growth:
   (a) Use of debt or other fixed return securities.
   (b) Issuing additional common shares.

Analyzing the Dividend Growth Model

There are three possible situations. To do this, let us consider a company with EPS of ₹ 2 and actual capitalization of 10%.

1. ***Normal capitalization rate less than actual capitalization rate:*** The shareholder in this case will gain more by investing in the company. For example, he may be expecting an 8% rate and the firm is actually achieving 10%. The shareholders want the firm to retain the earnings and achieve 10% return on them from similar investments. Thus, he would expect that raising the growth rate of a highly profitable firm. The intrinsic value at different payout ratios are worked out as below:

$$30\% \text{ Div. Payout} = \frac{.6}{8\% - (10\% \times 70\%)} = \frac{.6}{1\%} = ₹ 60$$

$$50\% \text{ Div. Payout} = \frac{1}{8\% - (10\% \times 50\%)} = \frac{1}{3\%} = ₹ 33.33$$

$$70\% \text{ Div. Payout} = \frac{1.4}{8\% - (10\% \times 30\%)} = \frac{1.4}{5\%} = ₹ 28$$

$$100\% \text{ Div. Payout} = \frac{2}{8\% - (10\% \times 0\%)} = \frac{2}{8\%} = ₹ 25$$

The intrinsic value drops from ₹ 60 at a 30% dividend payout to ₹ 25 at 100% payout.

Notes

2. ***Normal capitalization rate equal to capitalisation rate:*** In this case, the firm is doing about as well as expected and the shareholder probably does not care about the level of dividends. Intrinsic value will be ₹ 20 at all payout levels.

3. ***Normal capitalisation rate more than actual capitalization rate:*** In this situation, the firm is not doing as well as expected. It is expected that the intrinsic value to rise if the firm increased its dividend payout. Since the shareholders would like to have cash to invest at higher return elsewhere. The intrinsic value at different payout ratios are worked out as below:

$$30\%\ \text{Div. Payout} = \frac{.6}{12\% - (10\% \times 70\%)} = \frac{.6}{5\%} = ₹\,12$$

$$50\%\ \text{Div. Payout} = \frac{1}{12\% - (10\% \times 50\%)} = \frac{1}{7\%} = 14.3$$

$$70\%\ \text{Div. Payout} = \frac{1.4}{12\% - (10\% \times 30\%)} = \frac{1.4}{9\%} = ₹\,15.55$$

$$100\%\ \text{Div. Payout} = \frac{2}{12\% - (10\% \times 0\%)} = \frac{2}{12\%} = ₹\,16.67$$

The intrinsic value increases from ₹ 12 to ₹ 16.67 when the payout ratio is raised from 30% to 100%.

Miller and Modigliani Model

The irrelevance of dividends is provided by the MM Hypothesis. MM maintains that dividend policy has no effect on the share prices of the firm. What matters, according to them, is the investment policy through which the firm can increase its earnings and thereby the value of the firm given the investment decision of the firm, the dividend decision - splitting the earnings into packages of retentions and dividends - is a matter of detail and does not matter.

Under conditions of perfect capital markets, 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 Hypothesis is based on the following critical assumptions:

1. Perfect capital markets, in which all investors are rational. Information is available to all free of cost, there are no transaction costs, securities are infinitely divisible; no investor is large enough to influence the market price of securities, there are no floatation costs.
2. There are no taxes. Alternatively, there are no differences in tax rate applicable to capital gains and dividends.
3. A firm has a given investment policy which does not change. The operational implication of this assumption is that financing of new investment out of retained earnings will not change the business risk complexion of the firm and therefore, no change in the required rate of return.
4. There is a perfect certainty by every investor as to future investments and profits of the firm. In other words, investors are able to forecast future prices and dividends with certainty. This assumption is dropped by MM later.

Notes

MM Hypothesis: The Crux of the Argument

The crux of the MM position on the irrelevance of dividend is the arbitrage argument. Arbitrage refers to entering simultaneously into two transactions, which balance each other. The two transactions involve the payment of dividend on one side and raising external funds either through the sale of new shares or to raise loans - to finance investment programmers. Suppose a firm has some investment opportunity, it has two alternatives (1) it can retain its earnings to finance the investment or (2) distribute the dividend to the shareholders and raise an equal amount externally through sale of new shares. In case, the firm selects the second alternative, arbitrage process is involved in that the payment of dividends is associated with raising of funds through other means of financing. The effect of dividend payment on the shareholders wealth will be exactly offset by the effect of raising additional shares.

When dividends are paid, the market price of the shares will increase. But the issue of additional shares will cause a decline in the terminal value of the shares. What is gained by investors through increase dividends will be offset by the reduction in terminal value of the shares. The market price before and after payment of dividend would be same. The investors according to MM, is indifferent between dividend and retention of earnings. Since the shareholders are indifferent, the wealth would not be affected by current and future dividend decisions of the firm. It would depend entirely upon the expected future earnings of the firm.

There would be no difference as per MM, if external funds are raised in the form of debt instead of equity. This is because of their indifference between debt and equity with respect of leverage. The cost of capital is independent of leverage and the real cost of debt is the same as the real cost of equity.

The arbitrage process also implies that the total market value plus current dividends of two firms, which are alike in all respects except Dividend Payout Ratio, will be identical. The individual shareholder can retain and invest his own earnings and do this, as well as the firm.

With dividends being irrelevant, a firm's cost of capital would be independent of its Dividend Payout Ratio.

Finally, the arbitrage process will ensure that under conditions of uncertainty also the dividend policy is irrelevant.

When two firms are similar in respect of business risk, the prospective future earnings and investment policies, the market price of their shares must be the same. This MM considers, due to the rational behaviour of the investors who prefer more wealth to less wealth. Differences in current and future dividend policies cannot affect the market value of the two firms, as the present value of prospective dividends plus terminal value are the same.

MM Hypothesis Proof

MM provides the proof in support of their argument in the following way:

In the first step: The market value of a share in the beginning of the period is equal to the present value of dividend paid at the end of the period plus the market price of the share at the end of the period. Symbolically:

$$P_0 = \frac{1}{(1 + K_e)} (D_1 + P_1) \qquad \ldots\ldots(1)$$

where,

P_0 = The prevailing market price of a share

Notes

K_e = The cost of equity capital

D_1 = the dividend to be paid at the end of the period one

P_1 = The market price of a share at the end of period one with no external financing the total value of the firm will be as follows:

$$nP_0 = \frac{1}{(1+K_e)} (nD_1 + nP_1) \quad \text{..... (2)}$$

where, n = No. of shares outstanding

Now, if the firm finances its investment decisions by raising additional capital issuing n1 new shares at the end of the period (t = 1), then the capitalized value of the firm will be the sum of the dividends received at the end of the period and the value of the total outstanding shares at the end of the period less the value of the new shares. Since this adjustment is actually adding and reducing the value of the new shares. Thus we have:

$$nP_0 = \frac{1}{(1 + K_e)} [nD_1 + (n + n) P_1 - n_1 P_1] \quad \text{.... (3)}$$

Firms will have to revise additional capital to fund its investment requirement, if its investment requirement is more than its retained earnings, additional equity capital (n_1P_1) after utilizing its retained earnings will be as follows:

$$n_1P_1 = I - (E - nD_1) \quad \text{.... (4)}$$

where, I = Total investment required

nD_1 = Total dividends paid

E = Earnings during the period

$(E-nD_1)$ = retained earnings

Simplifying the above equation we get,

$$N_1P_1 = I - E + nD_1 \quad \text{.... (5)}$$

Substitute the value of the new shares in equation (3) we get

$$nP_0 = \frac{1}{(1 + K_e)} [nD_1 + (n + n) P_1 - 1_1 + E - nD_1)]$$

$$= \frac{nD_1 + (n + n_1) P_1 - 1 + E - nD_1}{1 + k_e}$$

$$= \frac{(n + n_1) P_1 - 1 + E}{(1 + k_e)} \quad \text{.... (6)}$$

[Since the positive nD_1, and negative nD_1 cancels]

Since dividends (D) are not found in equation (6), MM concludes that dividends do not count and that dividend policy has no effect on share price.

Let us take an example to explain MM theory:

Example: The capitalization rate of A Ltd. is 12%. The company has outstanding shares to the extent of 25,000 shares selling @ ₹ 100 each. Assume, the net income anticipated for the current financial year of ₹ 3,50,000. A Ltd. plans to declare a dividend of ₹ 3 per share. The company has investment plans for new project of ₹ 500,000. Show that under the MM Model, the dividend payment does not affect the value of the firm.

Notes

Solution: To prove that MM model holds good, we have to show that the value of the firm remains the same whether dividends are paid or not.

1. The value of the firm, when dividends are paid:

Step 1: Price per share at the end of year I

$$P_0 = \frac{1}{(1+k_e)}(d_1 + P_1)$$

$$100 = \frac{1}{1.12}(3 + P_1)$$

$$P_1 = ₹\ 109$$

Step 2: Amounts to be raised by the issue of new shares to finance investment requirement:

$$N1P1 = I - (E - nD_1)$$

$$= 500{,}000 - (350{,}000 - 25000 \times 3)$$

$$= 225{,}000$$

Step 3: No. of shares to be raised

$$n_1 = \frac{225000}{109} \text{ Nos.}$$

Step 4: Value of the firm

$$nP_0 = \frac{(n + n_1)P_1 - I + E}{(1+k_e)}$$

$$= \frac{(25{,}000 + 225{,}000/109) \times 109 - (500{,}000) + 350{,}00)}{1.12}$$

Value of the firm nP_o = ₹ 25,00,000

2. Value of the firm when dividends are not paid:

Step 1: Price per share at the end of year I

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1)$$

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

$$P_1 = ₹\ 112$$

Step 2: Amount to be raised from the issue of shares

$$500{,}000 - 350{,}000 = 150{,}000$$

Step 3: No. of shares to be raised 150,000/1.12

Step 4: Value of the firm

$$nP_0 = \frac{(n + n_1)P_1 - I + E}{(1+k_e)}$$

$$= \frac{(25{,}000 + 150{,}000/1.12) \times 1.12 - (500{,}000) + 350{,}00)}{1.12}$$

Notes

Value of the firm nP_o = ₹ 25,00,000

Thus the value of the firm in both the cases remains the same.

Critical Analysis of the Assumptions

1. ***Tax effect:*** The assumption cannot be true since the tax rate for the dividend and capital gains are different.
2. ***Floatation costs:*** The proceeds that the firm gets from the issue of securities are net off the issue expenses - the total issue expenses include underwriting expenses, brokerage and other marketing costs, to the tune of 10 - 15% of the total issues in India. These high costs cannot be ignored.
3. ***Transaction costs:*** It is an unrealistic assumption that investors do not have to incur transaction costs like brokerage when disposing off the shares. Further, the inconvenience and the uncertainty involved in the share price movements make the investors prefer current income by way of dividend to plough back of profits by the company.
4. ***Market conditions:*** Sometimes, market conditions do effect the investment decisions of the firm. For instance, though a firm has profitable investment opportunities, the bad market condition may not allow it to mobilize the funds. In such cases, firm will have to depend on the retained earnings and will have a low dividend payout ratio.

Caselet

'More generous' Dividend this Year – India will Continue to be Most Competitive: Premji

The Wipro Chairman, Mr Azim Premji, has indicated a "more generous" dividend payout than in the past two years from its existing cash kitty of close to $1 billion. The company was on the lookout for mid-sized acquisitions in the US, Europe and India, he said at a press conference in New Delhi on Sunday.

"We have $1 billion in cash reserves which will be utilised for the payment of dividend and the acquisitions. The dividend payout ratio will be more generous than in the past two years, but in line with what we have indicated under the broad outline of the company's current dividend policy," Mr Premji, who owns 81 per cent of the company, said.

Mr Premji said Wipro was looking at mid-sized acquisitions in America and Europe, and also in the domestic market. "It will enhance our consultancy skills. We are not looking for general-purpose acquisitions, but at specialised verticals. We are looking for companies which can give us a good geography such as continental Europe," he said.

Expansion plans: In a bid to leverage on other low-cost locations, Wipro plans to set up an integrated IT and BPO facility in Bucharest (Romania) in the next 8-12 weeks.

"The centre would serve the markets of Germany and France. We are also looking at one more centre in Far East which will be more cost-efficient than China," he said. Wipro currently has centres in Shanghai and Beijing, he added.

The share of business from other low-cost countries would increase, he said but pointed out that India was still the most cost-effective destination.

Contd...

Notes

"India churns out 3,50,000 engineers per annum while the US graduates 70,000 engineers. Germany graduates more architects than engineers. Engineering is not getting the desired attention in Western nations, and in three years, it will lead to a shortage of technical talent. It costs $7,500 for an engineer in India while the same is $55,000 in the US. Even with a 12 per cent salary hike in India, the cost per person will continue to be less here. India will continue to reign in terms of competitiveness", he argued.

Wipro BPO: "In addition to voice, we are driving the transaction processing business. It is 14-15 per cent of the total sales but in two years we hope to increase it to 40 per cent as it has a larger market share possibility," Mr Premji said. Wipro BPO currently has 14,000 employees.

Source: http://www.thehindubusinessline.in/2005/11/28/stories/2005112802050200.htm

9.7 Summary

- Profit is the primary motivating force for any economic activity, business enterprise, essentially being an economic organization has to maximize the welfare of its stakeholders. To this end, the business undertaking has to earn profit from its operations.
- Profit is the excess of revenues from operations over expenses on conducting such operations over expenses on conducting such operations.
- Profit growth coupled with high level of profit and the ability to maintain reasonable profit will help towards ensuring that shareholders receive an adequate dividend; preserving the assets worth of the business; generating a sufficient cash flow out of profits to provide capital for expansion; and providing funds for the research and development of new and improved products to replace existing products before they go into decline.
- From the point of view of dividend decision it is better to call management of profit as management of earnings. Earnings mean net earnings available to equity shareholders from where a firm actually declares dividends or retain profits for financing of investment opportunities.

  Net earnings = operating profit – (Interest + tax + preference dividend)
- Management of earnings means how the earnings of a firm are be determined and how they are utilized or appropriated or allocated or distributed. Management of earnings policy must maximize value of the firm, there by maximize benefits to its owners.
- The term 'dividend' refers to that portion of company's net earnings that is paid out to the equity shareholders (not for preference shareholders, since they are entitled to have a fixed rate of dividend).
- Dividend policy of a firm decides the portion of earnings to be paid as dividends to ordinary shareholders and what portion is ploughed back in the firm for investment purpose. The alternative use of net earnings or net profit dividends and retained earnings are competitive and conflicting, since it affects the value of the firm.
- There are different types of dividend policies: stable dividend policy, here "stability" refers to the consistency or lack of variability in the stream of dividend payments. In more precise terms, stable dividend means payment of a certain minimum amount of dividend regularly. There are three distinct forms of stability; they are (a) Constant dividend per share, (b) Constant payout ratio, and (c) Stable rupee dividend plus extra dividend.
- As there is a positive relation between dividend policy of a firm and the value of that firm. The dividend payout ratio of a firm should be determined with reference to two objectives-

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first maximization of shareholders' wealth and second providing sufficient funds to finance growth. There is a need to consider the factors that affect the dividend policy. They are: (1) Nature of earnings, (2) Age of company, (3) Liquidity position of the company, (4) Equity shareholders preference for current income, (5) Requirements of institutional investors, (6) Legal rules, (7) Capital impairment rule, (8) Contractual requirements, (9) Financial needs of the company, (10) Access to the capital market (external sources), (11) Control objective, (12) Inflation, (13) Dividend policy of competitors, (14) Past dividend rates of the company, and (15) others that includes - Trade cycles, corporate taxation policy, attitude of investors group and repayment of loan.

9.8 Keywords

Dividend: It refers to that portion of company's net earnings that is paid out to the equity shareholders.

Dividend Policy: It decides the portion of earnings to be paid as dividends to ordinary shareholders and what portion is ploughed back in the firm for investment purpose.

Payout Ratio: The ratio of dividend to earnings is known as payout ratio.

9.9 Review Questions

1. Compare between bonus share and stock split.
2. Explain the reasons for stock split.
3. What is free reserve?
4. Describe the process to compute net earnings.
5. Discuss the dividend policy and its importance.
6. Describe the different types of dividend policies.
7. Explain the concept of scrip dividend.
8. Discuss Bond dividend.
9. What is stable dividend policy? Discuss the different forms of stable dividend policy.
10. List the advantages and disadvantages of stock dividend.
11. 'Payment of dividend involves legal considerations'. Discuss.
12. 'Stock dividends are unfair to those stockholders who desire cash income'. Comment.
13. What is stock split? Why is it used? How is it different from a bonus share?
14. Comment-'Bonus shares represent simply a division of corporate pie into a large number of pieces'.
15. What is stock dividend? Discuss the advantages of stock dividend to the company.

Answers: Self Assessment

1. Net earnings
2. Value
3. Long-term finance
4. Stable dividend
5. True
6. False

7.	True	8.	True
9.	False	10.	False
11.	False	12.	True
13.	True	14.	True
15.	Stock split	16.	30
17.	Stock dividend	18.	Scrip dividend
19.	Cash	20.	Paid up capital.

Notes

9.10 Further Readings



Books

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Van Horne, J.C and Wachowicz, Jr, J.M., *Fundamentals of Financial Management,* New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

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Unit 10: Working Capital Management

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Objectives

After studying this unit, you will be able to:

- Recognize the meaning and significance of working capital;
- Explain how to determine working capital requirements;
- Describe the different aspects of financing working capital needs;
- Discuss the issue of banking finance facility for working capital.

Introduction

Procurement of funds is firstly concurred for financing of working capital requirement of the firm and secondly for financing fixed assets.

Notes

Working capital management is the functional area of finance that covers all the current accounts of the firm. It is concurred with management of the level of the individual current assets as well as management of total working capital.

10.1 Meaning and Concept of Working Capital

Working capital refers to the funds invested in current assets i.e., investment in sundry debtors, cash and other current assets. Current assets are essential to utilize facilities provided by plant and machinery, land and buildings. In case of the manufacturing organization, a machine cannot be used without raw material. The investment in the purchase of raw materials is identified as working capital. It is obvious that a certain amount of funds are tied up in raw material inventories, work in progress, finished goods, consumable stores, sundry debtors and day-to-day cash requirements. However, the organization also enjoys credit facilities from its suppliers by way of credit. Similarly, the organization need not pay immediately for various expenses, etc., The workers are paid only periodically. Therefore, a certain amount of funds automatically become available to finance the current assets requirement. However, the requirement of current assets is usually greater than the amount of funds provided through current liabilities. The goal of working capital management is to manage the firm's current assets and current liabilities in such a way that a satisfactory level of working capital is maintained.

From the point of view of concept the term, working capital, can be used in two different ways:

Gross working capital: The gross working capital refers to investment in all the current assets taken together. The total of investments in all current assets is known as gross working capital.

Net working capital: Net working capital refers to the excess of total current assets over total current liabilities. Current liabilities are those liabilities that are intended to be paid in the ordinary course of business within a year, out of the current assets or earnings of the concern.

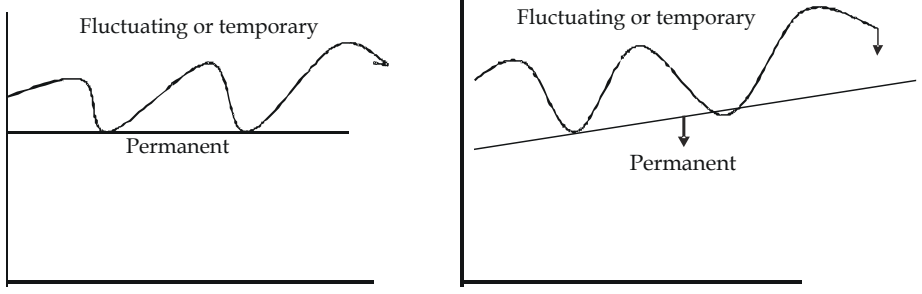
From the point of view of time, the term working capital can be divided into two categories:

Permanent: It is also referred as hard core working capital. It is the minimum level of investment in the current assets that is carried by the business at all times to carry out maximum level of its activities. It should be financed by long-term sources.

Temporary working capital: It refers to that part of working capital, which is required by the business over and above permanent working capital. It is also called variable working capital. Since the quantum of temporary working capital keeps on fluctuating from time-to-time depending on the business activities, at may be financed from short-term sources.

The following figure shows permanent and temporary or fluctuating or variable working capital:

Figure 10.1: Permanent and Temporary Working Capital



X axis -Time

Y axis- Amount of Working Capital- Permanent and Temporary or fluctuating

Notes

10.1.1 Factors Affecting Working Capital

The important factors are:

1. ***General Nature of Business:*** In some organizations, the sales are mostly in cash basis and the operating cycle (explained) later is also short. In these concerns, the working capital requirement is comparatively low. Mostly, service companies come under this category. In manufacturing companies, usually the operating cycle is very long and a firm is also required to give credit to customers to boost sales. In such cases, working capital requirement is high. Similarly, a trading concern requires lower working capital than a manufacturing concern.

2. ***Production Policy:*** Working capital requirements also fluctuate according to production policy adopted by the company



Example: in case of products having seasonal demand a steady production can be planned throughout the year in which case finished goods are to be kept for a longer period. The other alternative is to produce only during the season in which case raw materials have to be accumulated throughout the year.

3. ***Credit Policy:*** A company, which allows liberal credit to its customers, may have higher sales, but consequently will have larger amount of funds tied up in sundry debtors. Similarly a company, which has very efficient debt collection machinery and offers strict credit terms, may require lesser amount of working capital that the one where debt collection system is not so efficient where the credit terms are liberal.

   The creditability of a company in the market also has an effect on the working capital requirement. Reputed and established concern can purchase raw material on credit and enjoy many other services like door delivery, after sales service, etc., This would mean that they could easily have large current liabilities.

4. ***Inventory Policy:*** The inventory policy of a company also has an impact on the working capital requirements. An efficient firm may stock raw material for a smaller period and may, therefore, require lesser amount of working capital.

5. ***Abnormal Factors:*** Abnormal factors like strikes and lockouts require additional working capital. Recessionary conditions necessitate a higher amount of stock of finished goods remaining in stock. Similarly, inflationary conditions necessitate more funds, to maintain the same amount of current assets.

6. ***Market Conditions:*** In case of competitive pressure, large inventory is essential, as delivery has to be off the shelf or credit has to be extended on liberal terms.

7. ***Conditions of Supply:*** If prompt and adequate supply of raw materials, spares, stores, etc., is available it is possible to manage with small investments in inventory or work on Just-In-Time (JIT) inventory principles. However, if supply is erratic, scant, seasonal, channelised through government agencies etc., It is essential to keep larger stocks increasing working capital requirements.

8. ***Business Cycle:*** Business fluctuations lead to cyclical and seasonal changes in the production and sales and affect the working capital requirements.

9. ***Growth and Expansion Activities:*** The working capital of the firm increases as it grows in terms of sale or fixed assets.

10. ***Level of Taxes:*** The amount of taxes to be paid is determined by the prevailing tax regulations. Very often taxes have to be paid in advance on the basis of the profit of the

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preceding year. Management has no discretion in regard to payment of taxes; in some cases non-payment may invite penal action. There is, however, wide scope to reduce the tax liability through proper tax planning.

11. ***Dividend Policy:*** Payment of dividend utilizes cash while retaining profit acts as a source of working capital. Thus working capital gets affected by dividend policies.

12. ***Operating Efficiency:*** Efficient and co-ordinated utilization of capital reduces the amount required to be invested in working capital.

13. ***Price Level Charges:*** Inflationary trends in the economy necessitate more working capital to maintain the same level of activity.

14. ***Depreciation Policy:*** Depreciation charges do not involve any cash outflow. The effect of depreciation policy on working capital is, therefore, indirect. In the first place, depreciation affects the tax liability and retention of profits and on dividend.

15. ***Vagaries in the Availability of Raw Materials:*** The availability or otherwise of certain raw materials on a continuous basis without interruption would sometimes effect the requirement of working capital. There may be some materials, which cannot be procured easily either because their sources are few or they are irregular. To sustain smooth production, therefore, the form may be compelled to purchase and stock them far in excess of genuine production needs. This will result in an excessive inventory of such materials.

Self Assessment

Fill in the blanks:

1. The total of investments in all current assets is known as …… working capital.
2. The effect of depreciation policy on working capital is …… .

10.2 Importance of Adequate Working Capital and Optimum Working Capital

A concern needs funds for its day-to-day running. Adequacy or inadequacy of these funds would determine the efficiency with which the daily business may be carried on. A large amount of working capital would mean that the company has idle funds. Such firms have a cost. The company has to pay large amount as interest on such funds. This results in over-capitalization. Over-capitalization implies that the company has too large funds for its requirements, resulting in a low rate of return a situation, which implies a less than optimal use of resources.

If the firm has inadequate working capital, it is said to be under-capitalized. Such a firm runs the risk of insolvency. This is because paucity of working capital may lead to a situation where the firm may not be able to meet its liabilities. It is interesting to note that many firms that are otherwise prosperous (having good demand for their products and enjoying profitable marketing conditions) may fail because of lack of liquid resources.

A question may arise as to what is the amount of optimum working capital for a firm.

It cannot be overemphasized that optimum working capital can be determined only with reference to the particular circumstances of a specific situation. Thus, in a company where the inventories are easily saleable and the sundry debtors are as good as liquid cash, the current rates may be lower than 2 and yet the firm may be sound. An optimum working capital ratio is dependent upon the business situation as such and the nature and composition of various current assets.

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Example: in the case of vanaspati manufacturing company enjoying high reputation and credit terms in the market, a current ratio of 1.6 has been serving as ideal. On the other hand, a company engaged in manufacturing heavy electrical equipment and machinery and the business mostly being static electricity board might have to maintain a current ratio of more than 3.

The Trade-off between Profitability and Risk

The conversion of current assets for inventory to receivables to cash provides the sources of cash used to pay the current liabilities. The cash outlays for current liabilities are relatively preferable. When an obligation is incurred, the firm generally knows the corresponding payment will be due. What is difficult to predict are the cash inflows – the conversion of the current assets to more liquid term. The more predictable its cash inflows, the less net working capital a firm needs. Since most firms are unable to match cash inflows to cash outflows with certainty, current assets that more than cover outflows for current liabilities are usually necessary. In general, the greater the margin by which a firm's current assets cover its current liabilities, the better able it will be to pay its bills as they become due.

A trade-off exists between a firm's profitability and its risk probability. In this context, is the relationship between resources and costs generated by using the firm's assets – both current and fixed – in productive activities? A firm's profits can be increased by (1) increasing revenues or (2) reducing costs.. A firm that cannot pay its bills when due, is said to be technically insolvent.



Did u know? **What is risk in short term context?**

Risk, in the context of short-term financial management (working capital management) is the probability that a firm will be unable to pay its bills as they become due.

Changes in Current Assets

How changing the level of firm's current assets affects its profitability – risk trade-off can be demonstrated using the ratio of current assets to total assets. This ratio indicates the percentage of total assets that is current. (It is assured that the level of total assets remains unchanged). When the ratio increases, that is, when current assets increase – profitability decreases. Why? Because, current assets are less profitable than fixed assets. Fixed assets are more profitable because they add more value to the product than provided by current assets.

The risk effect, however, decreases, as the ratio of current assets to total assets increase. The increase in current assets increases net working capital, thereby reducing the risk of technical insolvency. The opposite effects on profits and risk result from a decrease in the ratio of current assets to total assets.

Changes in Current Liabilities

How changing the level of firm's current liabilities affects its profitability – risk trade- off can be demonstrated by using the ratio of current liabilities to total assets. This ratio indicates the percentage of total assets that has been financed with current liabilities. (Assume that the total assets remain unchanged). Then ratio increases, profitability increases, because the form uses more of the less expensive current liabilities financing and less long term financing current liabilities are basically debts on which the firm pays no charge or interest. However, when the ratio of current liabilities to total assets increases, the risk of technical insolvency also increases, because the increase in current liabilities in turns decreases not working capital. The opposite effects on profit and risk result from a decrease in the ratio of current liabilities to total assets.

Notes

Table 10.1: The Effects of Changing Ratios in Profits and Risks

Ratio	Change in Ratio	Effect on profits	Effect on risk
Current Assets	Increase	Decrease	Decrease
Total Assets	Decrease	Increase	Increase
Current Liabilities	Increase	Increase	Increase
Total Assets	Decrease	Decrease	Decrease

Self Assessment

Fill in the blanks:

3. If the firm has inadequate working capital, it is said to be…….. .
4. …….. implies that the company has too large funds for its requirements, resulting in a low rate of return a situation.

10.3 Managing Working Capital

This involves two processes:

1. ***Forecasting requirements of funds:*** Changes in firms operation can have almost immediate effects on the working capital.



Example: if the suppliers increase the price of raw materials, more money will be tied up in inventory than earlier. Even if the firm can increase the price of its final product, additional working capital will be required to support its sales efforts.



Did u know? A proactive manager with charges in operating activities will estimate the working capital requirement and take necessary action for funds.

2. ***Arranging funds:*** Once the requirement has been estimated, the manager will arrange the necessary funds from the best source, for the lowest cost and for the time period involved.

The effective management of working capital is the primary means of achieving the firm's goal of adequate liquidity. It is after all, the working capital – cash, marketable securities, receivables and inventory – that will be available to pay bills and meet obligations. It is the net working capital i.e., difference of current assets over current liabilities – that gives the degree of protection against problems that might cause a shortage of funds.

Managing working capital requires a number of actions, including the following:

1. ***Monitoring levels of cash receivables and inventory:*** On a daily or weekly basis, the manager should know how much funds are tied up in each of the current asset accounts. Ratio analysis offers a quick and reasonable accurate method of doing this. By comparing ratios with previous periods and industry norms, the managers can identify the variation and investigate. The following ratios can be used:
   (a) Current assets/total assets
   (b) Current assets/current liabilities
   (c) Current assets – inventory/current liabilities
   (d) Cash and marketable securities/current assets

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2. ***To have understanding of the percentage of funds in current accounts:*** Working capital represents a sizeable investment for most firms. Normally, 30 to 60% of the firm's total assets are tied up in current accounts.

3. ***Recording time spent managing current accounts:*** Financial Managers spend much of their time to the daily internal operations relating to current assets and current liabilities of the firms. Although estimates vary, managers spent somewhere between on third and two thirds of their time in managing the working capital.



Caution The manager should be aware of the relationship between current and fixed assets and any charges in the percentage of funds in current accounts.

10.3.1 How much Working Capital is Needed

A number of factors need to be included in the analysis, such as the following:

1. ***Size of the firm:*** It may be argued that a firm's size, either in assets or sales will affect its need for working capital. A small firm may have extra current assets as a cashier against cash flow disruptions. Small firms have cash inflows from fewer sources than larger firms and hence are more affected by the failures of a few customers to pay on time. Larger firms with many sources of funds may need less working capital as compared to total assets on sales.

2. ***Activities of firm:*** If the firm requires to stock large inventory or sell on relatively easy credit terms, it will have greater needs for working capital than firms providing services or only having cash sales.

3. ***Availability of credit:*** A firm with readily available credit from banks will be able to plan for less working capital than a firm without such credit.

4. ***Attitude towards profits:*** All funds have a cost; a relatively large amount of current assets tends to reduce a firm's profit. Some firms want extra working capital and are willing to suffer small costs. Other firms maintain an absolute minimum of working capital to gain the full profits from operation.

5. ***Attitude towards risk:*** The greater the amount of working capital particularly cash and marketable securities the lower the risk of liquidity problems. Firms that do not wish to incur even slight risks of liquidity problem may like to keep extra cash. Other firms accept the risks to earn profits and may not even keep adequate cash to pay bills always on time.



Did u know? Most firms seek to maintain sufficient working capital to meet their needs for liquidity without tying up unnecessary funds.

10.3.2 Forecasting Working Capital Needs

The following are some of the methods used in practice:

1. ***Current assets holding period:*** To estimate working capital requirements on the basis of average holding period of current assets and relating them to cost based on company experience in the previous year.

2. ***Ratio of sales:*** To estimate working capital requirements as a ratio of sales on the assumption that current assets charge with sales. This can be done through statistical

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techniques like linear regression. A formula is developed for the straight line that best fits the data and this formula can be used to express the relationship between two variables – say prior month's sales and working capital. The most widely used regression technique employs the method of least squares. Let us take the following figures extracted from the books:

Table 10.2: Ratio of Sales

Month	Prior Months Sales X (000)	Working Capital Level Y (000)	X^2 (000,000)	XY (000,000)
January	450	300	202500	135000
February	400	300	160000	120000
March	350	250	122500	87500
April	300	220	90000	66000
May	250	200	62500	50000
June	500	400	250000	200000
July	700	500	490000	350000
August	600	450	360000	270000
September	300	300	90000	90000
October	250	250	62500	62500
November	650	500	422500	325000
December	550	400	302500	220000
	5300	**4070**	**2615000**	**1976000**
	Σx = 5300(000)	**Σy= 4070(000)**	**Σx^2= 2615000 (000,000)**	**Σxy = 1976000**

$$Y = a + bx$$

$$\Sigma y = Na + b\Sigma x - 1$$

$$\Sigma xy = a\Sigma x + b\Sigma x2$$

From (1) - 4070000 = 12a + 5300,000b

From (2) = 1976000 (000,000) = 5300 000

To get the line of best fir Y = a + bx, we can use the following formula

$$\Sigma y = Na + b\Sigma x$$

$$\Sigma xy = a\Sigma x + b\Sigma x2$$

Solving the above two equations, we get,

a = 35638 and b = 0.687

Hence, the line of best fit Y = 35638 + 0.687 ×

Suppose in October, the firm had sales of ₹ 1.25,000, the estimated working capital will be 35638 + 0.687 × 425000 = ₹ 327613

3. ***Ratio of fixed investment:*** To estimate working capital requirements as a percentage of fixed investment.

Notes

Self Assessment

Fill in the blanks:

5. The greater the amount of working capital particularly cash and marketable securities the lower the risk of …….. problems.

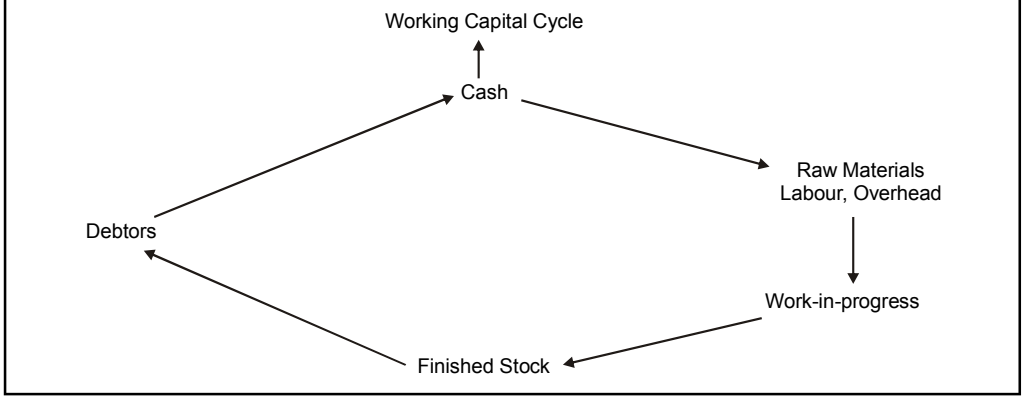
6. A firm with readily available credit from banks will be able to plan for …….. working capital.

10.4 Working Capital Cycle (Operating Cycle)

The working capital cycle refers to the length of time from purchase of production inputs (raw materials) entering the production process (work in progress when labour costs and factory overheads are incurred), work in progress get converted into finished products, finished products when sold on credit and get converted into Accounts Receivable and Debtors being realized in cash after the expiry of the credit period. Thus, there is a complete cycle from cash to cash wherein cash gets converted into raw materials, work in progress, finished goods, debtors and finally into cash again. Short-term funds are required to meet the requirement of funds during this time period. This time period is dependent upon the length of time within which the original cash gets converted into cash again. This cycle is also known as operating cycle or cash cycle.

The working capital cycle is depicted below:

Figure 10.2: Working Capital Cycle



Notes The determination of working capital cycle helps in the forecast, control and management of working capital. It indicates the total time lag and the relative significance of its constituent parts. The duration of working capital cycle may vary depending on the nature of the business. The duration of the operating cycle for the purpose of estimating working capital is equal to the sum of the duration of each of the above events less the credit period allowed by the suppliers.

Example: A company holds raw materials on an average for 60 days, it gets credit from the supplier for 15 days, production process needs 15 days, finished goods are held for 30 days and 30 days of credit is extended to debtors. The total of all these days minus the credit days

allowed by the supplier is the total working capital cycle i.e., 60 + 15 + 30 + 30 – 15 days i.e., 120 days.

Notes

In the form of an equation, the operating credit process can be expressed as follows:

Operating cycle = R + W + F + D – C

R = Raw material storage period

W = Work in progress holding period

F = Finished goods storage period

D = Debtors Collection period

C = Credit period allowed by the suppliers

The various components of operating cycle may be calculated as shown below:

1. Raw material storage period = $\frac{\text{Average stock of raw material}}{\text{Avg. cost of raw material consumption per day}}$

2. Work in progress holding period = $\frac{\text{Average work in progress inventory}}{\text{Avg. cost of production per day}}$

3. Finished goods storage period = $\left\{\frac{\text{Est. production (in units)} \times \text{direct labour per unit}}{\text{12 months/360 days}}\right\}$

$$\frac{\text{Average stock of finished goods}}{\text{Avg. cost of goods sold per day}}$$

4. Debtors collection period = $\frac{\text{Average book debts}}{\text{Avg. credit sales per day}}$

5. Credit period availed from the suppliers = $\frac{\text{Avg. trade creditors}}{\text{Avg. credit purchases per day}}$

Example:

From the following information of XYZ Ltd. Calculate:

1. Net operating cycle period
2. Number of operating cycles in a year

(a)	Raw material inventory consumed during the year	₹ 12,00,000
(b)	Average stock of raw material	1,00,000
(c)	Work in progress inventory (cost of production)	10,00,000
(d)	Average work in progress inventory	60,000
(e)	Finished goods inventory (cost of goods sold)	16,00,000
(f)	Average finished goods stock held	80,000
(g)	Average collection period for debtors	45 days
(h)	Average credit period availed from suppliers	30 days
(i)	No. of days in a year	360 days

Notes

Solution: Calculation of net operating cycle period of XYZ Ltd.

$$\text{Raw material storage period} = \frac{\text{Avg. stock of RM}}{\text{Avg. cost of RM consumption/day}}$$

$$= \frac{100,000}{3333,33} = 30 \text{ days}$$

$$\text{WIP Holding period (b)} = \frac{\text{Avg. WIP inventory}}{\text{Avg. cost of production per day}}$$

$$= \frac{60,000}{10,00,000 \div 360} = \frac{60,000}{2777.77} = 22 \text{ days}$$

$$\text{Finished goods storage period (c)} = \frac{\text{Avg. F.G. inventory}}{\text{Avg. cost of goods sold/ day}}$$

$$\frac{80,000}{16,00,000 \div 360} = \frac{80,000}{4444.44} = 18 \text{ days}$$

Debtors Collection Period (d)	45 days
Total operating cycle (a) + (b) + (c) + (d)	115
Less. Avg. credit period availed	30
Net operating cycle period	85
No. of operating cycle in a year	$\frac{360}{85}$ = 4.2 times

10.4.1 Estimate of Future Working Capital based on Current Assets and Current Liabilities

The estimate of future working capital can be made if the amount of current assets and current liabilities can be estimated as follows:

The various constituents of current assets and current liabilities have a direct bearing on the computation of working capital and the operating cycle. The holding period of various constituents of operating cycle may either contract or expand the net operating cycle period. Shorter the operating cycle period, lower will be the requirement of working capital and vice versa.

Estimation of Current Assets

The estimates of various components of working capital may be made as follows:

1. ***Raw material inventory:*** If the funds to be invested in raw materials/inventory may be estimated on the basis of production budget, the estimated cost per unit and the average holding period of raw material inventory by using the following formula.

$$\frac{\text{Est. production (in units)} \times \text{Est. cost of raw materials per unit} \times \text{Avg. raw materials holding period (month/days)}}{\text{12 month/360 days}}$$

Notes

Notes 360 days in a year are generally assumed to facilitate calculation.

2. ***Work in progress inventory:*** the funds to be invested in work in progress can be estimated by the following formula:

$$\frac{\text{Est. prodn. (in units)} \times \text{Est. work in process cost per unit} \times \text{Avg. holding period of WIP (month/days)}}{\text{12 month/360 days}}$$

3. ***Finished goods:*** The funds to be invested in finished goods inventory can be estimated with the help of the following formula:

$$\frac{\text{Est. prodn. (in units)} \times \text{cost of prodn. (per unit excl. dept.)} \times \text{Avg. holding period of Finished goods (month/days)}}{\text{12 month/360 days}}$$

4. ***Debtors:*** Funds to be invested in trade debtors may be estimated with the help of the following formula:

$$\frac{\text{Est. credit sales (in units)} \times \text{cost of sales (per unit excl. dept.)} \times \text{Avg. debtor collection Period (month/days)}}{\text{12 month/360 days}}$$

5. Minimum desired cash and bank balance, to be maintained by the firm have to be added in the current assets for calculation of working capital.

Estimation of Current Liabilities

Current liabilities generally affect computation of working capital. Hence the amount of working capital is lowered to the extent of current liabilities (other than bank credit) arising in the normal course of business. The important current liabilities like trade creditors, wage and overheads can be estimated as follows:

1. ***Trade creditors:***

$$\left\{\frac{\text{Est. yearly prod.} \times \text{Raw material req. per unit}}{\text{12 months/36 days}}\right\} \times \text{Credit period granted by supplier (months/days)}$$

2. ***Direct wages:***

$$\left\{\frac{\text{Est. production (in units)} \times \text{Direct labour per unit}}{\text{12 months/360 days}}\right\} \times \text{Avg. time lag in payment of wages (months/days)}$$

3. ***Overheads (other than depreciation and amortization)***

$$C = \sqrt{\frac{2\,U \times P}{S}} \times \text{Avg. time lag in payment of overhead (months/days)}$$

Caution The amount of overheads may be separately calculated for different types of overheads. In the case of settling overheads, the relevant claim should be sales volume instead of production volume.

Notes



Example: XYZ Co. Ltd. is a pipe manufacturing company. Its production cycle indicates that materials are introduced in the beginning of the production cycle; wages and overhead accrue evenly throughout the period of this cycle. Wages are paid in the next month following the month of accrual, work in process includes full units of raw material used in the beginning of the production process and 50% of wages and overheads are supported to be conversion costs. Details of production process and the components of working capital are as follows:

Production of pipes per annum	12,00,000 units
Duration of the production cycle	One month
Raw materials inventory held	One-month consumption
Finished goods inventory held for	Two months
Credit allowed by creditors	One month
Credit given to debtors	Two months
Cost price of raw materials	₹ 60 per unit
Direct wages	₹ 10 per unit
Overheads	₹ 20 per unit
Selling price of finished pipes	₹ 100 per unit

Required to calculate: the amount of working capital required for the company.

Solution:

Statement showing determination of working capital

1.	***Current Assets:***			
	(a)	Raw material inventory (1 month)	$\frac{1200,000 \times ₹ 60}{12}$	60,00,000
	(b)	Work in progress - Production cycle 1 month		
		Raw materials (materials added at the beginning)	60,00,000	
		Wages and overheads (avg. 50% complete)		
		(10 + 20) × 50% × 12,00,000/12	15,00,000	75,00,000
	(c)	Finished goods inventory (hold for 2 mths)		
		Total cost (60+10+20) × 12,00,000 × 2/12		1,80,00,000
	(d)	Debtors - 2 months credit (Total cost ₹ 90)		
		Hence, 90 × 12,00,000 × 2/12		1,80,00,000
		Total Current Assets		5,55,00,000
2.	***Current Liabilities:***			
	(a)	Creditors for raw materials (1 month credit period on purchases)		
		60 × 12,00,000 × 1/12	60,00,000	
	(b)	Creditors for wages - one month		
		10 × 12,00,000 × 1/12	10,00,000	70,00,000
		Net Working Capital		4,25,00,000

Notes

10.4.2 Working Capital Requirement based on Cash Cost

This approach is based on the fact that in the case of current assets, like sundry debtors and finished goods etc., The exact amount of funds blocked is less than the amount of such current assets.

Many experts, therefore, calculate the working capital requirements by working out cash cost of finished goods and sundry debtors. Under this approach the debtors are calculated not as a percentage of sales value but as a percentage of cash costs. Similarly, finished goods are valued according to cash costs.

10.4.3 Effect of Double Shift Working on Working Capital Requirements

The increase in the number of hours of production has an effect on the working capital requirements. The economy of introducing double shift is the greater use of fixed assets with little or marginal requirement of additional assets. In double shift working, an increase in stocks will be required but with double shift working, the increase in stocks will not be proportionate to the rise of production. Hence the minimum level of stocks may not be very much higher.

The amount of materials in process will not change due to double shift working. Since work started in the first shift will be completed in the second, hence capital tied up in materials in process will be the same as with single shift working. As such, the cost of work-in process, will not change unless the second shift workers are paid at a higher rate. Fixed overheads will remain fixed, whereas variable overheads will increase in proportion to the increased production. Semi-variable overheads will increase according to the variable element in them.

Self Assessment

Fill in the blanks:

7. The various constituents of current assets and current liabilities have a direct bearing on the computation of working capital and the …… .
8. …… the operating cycle period, lower will be the requirement of working capital.

10.5 Working Capital Policy

Two important issues in formulating the working capital policy are:

1. What should be the ratio of current assets to sales?
2. What should be the ratio of short term financing to long-term financing?

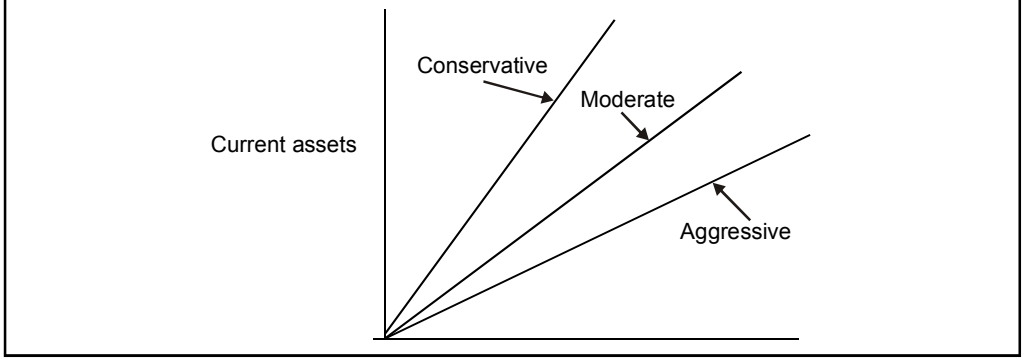
10.5.1 Current Assets in Relation to Sales

If the firm can free cash accurately its level and pattern of sales, inventory procurement time, inventory usage rates, level and pattern of production, production cycle time, split between cash sales and credit sales, collection period and other factors which impinge on working capital components. The investment in current assets can be defined uniquely. When uncertainty characterizes the above factors, as it usually does, the investment in current assets cannot be specified uniquely. In face of uncertainty, the outlay on current asset would consist of a base component meant to meet normal requirements and safety component meant to cope with

Notes

unusual demands and requirements. The safety component depends on how conservative or aggressive is the current asset policy of the firm. If the firm pursues a very conservative current asset policy it should carry a high level of current assets in relation to sales. (This happens because the safety components are substantial). If the firm adopts a moderate current asset policy, it should carry a moderate level of current assets in relation to sales. The relationship between current assets and sales under these current asset policies is shown in Figure 10.3.

Figure 10.3: Various Current Assets Policies



A conservative current asset policy tends to reduce risk. The surplus current assets under this policy enable the firm to cope rather easily with variations in sales, production plans and procurement time. Further the higher liquidity associated with this policy diminishes the chances of technical insolvency. The reduction of risk is also accompanied by lower expected profitability.

An aggressive current asset policy, seeking to maximize the investment in current assets, exposes the firm to greater risk. The firm may be unable to cope with anticipated changes in the market place and operating conditions. Further, the risk of technical insolvency becomes greater. The compensation for higher risk, of course, is the higher expected profitability.

10.5.2 Ratio of Short-term Financing to Long-term Financing

Working capital requirements should be met from short term as well as long-term sources of funds. It may be proper to meet at least 2/3rd of the permanent working capital from long-term sources.

Long-term funds reduce the risk but are costly. On the other hand, short-term funds have relatively lower cost but need to be repaid in the near future. Hence the finance manager has to make judicious use of both long-term and short-term sources. In this context, there are three basic approaches:

Marketing Approach (Hedging Approach)

When a firm uses long-term sources to finance fixed assets and permanent current assets and short term financing to finance temporary current assets.

Conservative Approach

Under this approach, a firm finances its permanent assets and also a part of temporary current assets with long-term financing and is less risky so far as insolvency is concerned, however the funds may be invested in such investments which fetch small returns to build up liquidity.

Aggressive Approach

Notes

The firm uses mere short-term financing than is warranted. In this approach, the firm finances a part of its permanent current assets with short-term financing. This is more risky, but may add to the return on assets.



Task How do changes in the ratio of current liabilities to total assets affect profitability and risk?

Self Assessment

Fill in the blanks:

9. A …… current asset policy tends to reduce risk.
10. The …… component depends on how conservative or aggressive is the current asset policy of the firm.

10.6 Financing of Working Capital

Following are the different short-term and long-term sources of finance available for working capital:

1. ***Long-term sources:*** For example, Share capital (equity and preference), Retained earnings, and debentures/bonds of different types, loans from bank and financial institutions, venture capital financing.
2. ***Short-term sources:***
   (a) *Bank credit:* cash credit, bills finance, overdraft facility, working capital demand loan, commercial paper.
   (b) *Transaction credit:* trade allowed by creditors, outstanding labour and other expenses.

Some of the short-term sources of finance are given below as a reference:

1. ***Trade credit:*** It represents credit granted by suppliers of goods, etc., as an incident of sale. The usual duration of such credit is 15 to 90 days. It can be in the form of an "open account" or "bills payable." Trade credit is preferred as a source of finance because it is without any explicit cost and till a business as a going concern keeps on rotating.
2. ***Advance from customers:*** Manufacturers and contractors engaged in producing and constructing costly goods involving considerable length of manufacturing or constructions usually demand advance mainly from their customers at the time of accepting the orders for executing the contracts or supplying the goods.
3. ***Bank advances:*** Banks receive deposits from public for different periods at varying rates of interest. These funds are invested and lent in such a manner that when required they may be called back. Lending results in firm revenues out of which costs such as interest on deposits, administrative costs are met and a reasonable profit is made.
4. ***Loans:*** In a loan account, the entire advance is disbursed at one time either in cash or by transfers to the current account of the borrower.

Notes

5. ***Overdraft:*** Under this facility, customers are allowed to withdraw in excess of credit advance standing to their current deposit account. A fixed amount is therefore granted to the borrower within which the borrower is allowed to overdraw his account.

6. ***Clean overdrafts:*** Request for clean advances is entertained only from parties, which are financially sound and reputed for their integrity. The bank has to rely upon the personal security of the borrowers.

7. ***Cash credits:*** Cash credit is an arrangement under which a customer is allowed to draw advance up to a certain limit against credit granted by bank. Generally, the limits are sanctioned against the security of goods by way of pledge or hypothecation. Though these accounts are repayable on demand, banks usually do not recall.

8. ***Bills purchased/discounted:*** Advances are allowed against the security of bills, which may be clean or documentary. Bills are sometimes purchased from approved customers in whose favour limits are sanctioned. Before granting a limit, the banker satisfies himself as to the credit worthiness of the drawer.

9. ***Advance against documents of title to goods:*** A document becomes a document of title to goods when its possession is recognized by law or business custom as possession of the goods. These documents include a bill of lading, dock warehouse keeper's certificate, railway receipt, etc.,

10. ***Term loan by banks:*** Term loan is an installment credit repayable over a period of time in monthly /quarterly/half yearly or yearly installment. Banks grant term loans for small projects falling under priority sector, small-scale sector and big units.

11. ***Commercial paper:*** It is a form of financing that consists of short-term, unsecured promissory notes issued by firms with a high credit standing. Most commercial papers have maturity ranging from 3 months to 6 months and denomination of minimum ₹ 5 lakhs.



Notes The companies satisfying the following conditions are eligible to issue commercial paper:

(a) The tangible worth of the company is ₹ 5 crores or more as per audited balance sheet of the company.

(b) The fund base working capital limit is not less than ₹ 5 crores.

(c) The company is required to obtain the necessary credit rating from the rating agencies such as CRISIL, ICRA, etc., and the rating should not be more than 2 months old at the time of applying to the RBI.

(d) The minimum current assets ratio should be 1.33:1 based on classification of current assets and liabilities.

(e) For public sector companies there are no listing requirements, but for companies other than public sector, the same to be listed or one or more stock exchanges.

12. ***Public deposits:*** A company can accept public deposits subject to the stipulation of Reserve Bank of India from time-to-time maximum up to 35 per cent of its paid up capital and reserves from the public and shareholders. These deposits may be accepted for a period of six months to three years. Public deposits are unsecured loans and are used for financing working capital requirements.

Self Assessment

Notes

Fill in the blanks:

11. ..... represents credit granted by suppliers of goods.

12. ..... is an arrangement under which a customer is allowed to draw advance up to a certain limit against credit granted by bank.



Case Study

Creative Promotion Company

Mr. Bhatt is a young man of bright ideas. Although he is employed as an engineer in one of the large engineering concerns in Lahore (Pakistan), he spends all his spare time developing new products in his private laboratory at home. Currently, he has commercially provided a domestic appliance called Lavex, which would be a great convenience kitchen to help housewives. He is not interest in manufacturing and selling his new products; his only interest in developing new products is to make money by way of selling patent rights to some established concerns. However, he releases that till he succeeds in selling the patent rights at the price he expects, he has to manufacture and sell the new products on ad hoc basis so as to demonstrate the commercial superiority of his products and thereby, to induce the parties to buy the patents from him. With this objective, he is currently thinking of manufacturing and selling 'Lavex'. He will not give up his full-time job; he will supervise and guide 'Lavex' production and sales during his spare time.

Bhatt has already spent ₹ 30,000 in developing the product. He proposes to buy the component from other parties and keep the production activity to a minimum. The minimum equipment required would cost ₹ 11,000. He would need to rent a small place for ₹ 1,200 per month for production. He proposes to use his residence as office for sales activity.

Bhatt proposes to introduce the product in Chennai city only. His sales projections are as follows:

January	60
February	40
March	110
April	140
May	220
June	180

He is not interested in pushing sales beyond 220 units per month as he cannot cope with the production. He has budgeted ₹ 20,000 for sales promotion, which will be spent mostly for demonstration in leading department stores in the city. The promotion budget is scheduled as follows :

	₹
January	7,000
February	7,000
March	3,000
April	3,000

Contd...

Notes

This selling price per units will be ₹ 280 and the dealers will be given 15 percent trade discount. He calculates that about 50 unit will be needed for "demonstration and display" in the leading sores at his cost. Although the sales to dealers will be made on one month's credit, he knows that the actual collections will be realized in about 4 weeks time. He rules out cash sales.

Assembling is one of the activity in the production process. Components and materials, which will be purchased from outside parties strictly on 30 days credit will cost ₹ 160 per unit. Wages per month will be ₹ 6000. The production capacity per month will be 220 units. Wages will be paid weekly. Overhead expenses are estimated at ₹ 2800 per month. Materials and components need to be ordered at least one month in advance. There will be inventory of finished goods or goods in process as the production will be strictly against firm orders. Bhatt proposes to employ a full-time production, sales supervisor for ₹ 880 per month.

Mr. Bhatt wants to know how much finance will be needed for his first six months of operation and when, so that he may plan accordingly.

Questions

1. Discuss the nature of the financial problem involved.
2. Prepare the monthly cash budget for the first six months period of the proposed venture.
3. How can the above-mentioned problem be sorted out?

10.7 Summary

- Working capital refers to the funds invested in current assets i.e., investment in sundry debtors, cash and other current assets.
- The total of investments in all current assets is known as gross working capital.
- Net working capital refers to the excess of total current assets over total current liabilities.
- The important factors Affecting Working Capital are General Nature of Business, Production Policy, Credit Policy, Inventory Policy, Abnormal Factors and Market Conditions.
- An optimum working capital ratio is dependent upon the business situation as such and the nature and composition of various current assets.
- The methods used for in Forecasting Working Capital Needs are: Current assets holding period, Ratio of sales and Ratio of fixed investment.
- Two important issues in formulating the working capital policy are: What should be the ratio of current assets to sales and what should be the ratio of short term financing to long-term financing?
- The different short-term sources available for working capital are Bank credit, Transaction credit etc.
- Long-term sources of working capital finance are Retained earnings, debentures/bonds of different types, loans from financial institutions, venture capital financing etc.
- Banks have always been important providers of funds in Indian scenario.

Notes

10.8 Keywords

Gross Working Capital: The total current assets are termed as the gross working capital.

Net Working Capital: The excess of current assets over current liabilities represents net working capital.

Permanent Working Capital: It is the minimum investment kept in the form of inventory of raw materials, work in progress, finished goods, stores and spares, and book debts to facilitate uninterrupted operation in a firm.

Temporary Working Capital: Any additional working capital apart from permanent working capital required to support the changing production and sales activities is referred to as temporary working capital.

Working Capital: It refers to short-term funds to meet operating expenses.

10.9 Review Questions

1. Why do we distinguish between permanent and variable working capital?
2. Why is the volume of sales the most important factor affecting working capital? Besides sales, what other factors affect working capital? Why?
3. What two processes are accomplished in the management of working capital?
4. Why should the manager know the percentage of funds in current accounts?
5. What are the two kinds of fluctuations in working capital levels? How should they be viewed?
6. What technique is used for identifying relationship between working capital levels and other variables such as sales level? What does this technique do?
7. At least three sets of guidelines for the sources of working capital are available. How are the three similar? How are they different?
8. Expenses reduce working capital, whereas charging of depreciation does not". Do you agree?
9. Can a company show a net loss in its profit and loss account and an increase in the working capital?

Answers: Self Assessment

1.	gross	2.	indirect
3.	under-capitalized	4.	Over-capitalization
5.	liquidity	6.	less
7.	operating cycle	8.	Shorter
9.	conservative	10.	safety
11.	Trade credit	12.	Cash credit

Notes

10.10 Further Readings



Books

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Unit 11: Management of Cash

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Objectives

After studying this unit, you will be able to:

- Describe the management of cash;
- Discuss the cash management planning and control aspects;
- Explain the different cash management models;
- Recognize the cash conversion cycle.

Introduction

Management of cash is an important function of the finance manager. The modern day business comprises of numerous units spread over vast geographical areas. It is the duty of the finance manager to provide adequate cash to each of the units. For the survival of the business, it is absolutely essential that there should be adequate cash. It is the duty of finance manager to maintain liquidity at all parts of the organization while managing cash. On the other hand, he has also to ensure that there are no funds blocked in idle cash. Idle cash resources entail a great deal of cost in terms of interest charges and in terms of opportunities costs. Hence, the question

Notes

of costs of idle cash must also be kept in mind by the finance manager. A cash management scheme, therefore, is a delicate balance between the twin objectives of liquidity and costs.

11.1 Cash Management

Need for Cash

The following are four motives for holding cash:

1. ***Transaction need:*** Cash facilitates the meeting of the day-to-day expenses and other payments on the debts. Normally, inflows of cash from operations should be sufficient for this purpose. But sometimes this inflow may be temporarily blocked. In such cases, it is only the reserve cash balance that can enable the firm to make its payments in time.
2. ***Speculative needs:*** Cash may be held in order to take advantage of profitable opportunities that may present themselves and which may be lost for want of ready cash/settlement.
3. ***Precautionary needs:*** Cash may be held to act as for providing safety against unexpected events. Safety as is typified by the saying that a man has only three friends – an old wife, an old dog and money at bank.
4. ***Compensation motive:*** Another motive to hold cash balances is to compensate banks for providing certain services and loans.

Nature of Cash Management

The exact nature of a cash management system would depend upon the organizational structure of an enterprise. In a highly centralized organization, the system would be such that the central or head office controls the inflows and outflows of cash on a routine and daily basis. In a decentralized form of organization, where the divisions have complete responsibility of conducting their affairs, it may not be possible and advisable for the central office to exercise a detailed control over cash inflows and outflows.

Self Assessment

Fill in the blanks:

1. Cash held in order to take advantage of profitable opportunities comes under the motive of …… needs.
2. The exact nature of a cash management system would depend upon the …… of an enterprise.

11.2 Cash Management Planning Aspects

The first step in cash management is to estimate the requirements of cash. For this purpose, cash flow statements and cash budgets are required to be prepared.



Did u know? **What is Cash budget?**

Cash budget is the plan of receipts and payments of cash during the budget period.

Notes

Cash budget represents cash requirements of business during the budget period. Cash budget can be prepared for either short or for long periods.

1. ***Cash budgets for short period:*** Preparation of cash budget month by month would involve making the following estimates:
   (a) As regards receipts:
      (i) Receipts from debtors;
      (ii) Cash sales; and
      (iii) Any other sources of receipt of cash (say, dividend from a subsidiary company).
   (b) As regards payments:
      (i) Payments to be made for purchases;
      (ii) Payments to be made for expenses;
      (iii) Payments that are made periodically but not every month;
         - Debenture interest;
         - Income tax paid in advance
         - Sales tax etc.
      (iv) Special payments to be made in a particular months, for example dividends to shareholders, redemption of debentures, repayments of loan, payment for assets acquired, etc.,
2. ***Cash budget for long period:*** Long-range cash forecast often resembles the projected source and application of funds statement. The following procedures may be adopted to prepare long-range cash forecasts:
   (a) Take the cash at bank and in the beginning of the year;
   (b) *Add:*
      (i) Trading profit (before tax) expected to be earned;
      (ii) Depreciation and other development expenses incurred to be written off;
      (iii) Sale proceeds of assets;
      (iv) Proceeds of fresh issue of shares or debentures; and
   (c) Reduction in working capital that is current assets (except cash) less current liabilities.
   (d) *Deduct:*
      (i) Dividends to be paid
      (ii) Cost of assets to be purchased
      (iii) Taxes to be paid
      (iv) Debentures or shares to be redeemed
      (v) Increase in working capital.

Notes

Self Assessment

Fill in the blanks:

3. ……... is the plan of receipts and payments of cash during the budget period.
4. To estimate the requirements of cash, ……... statements and cash budgets are required to be prepared.

11.3 Cash Management Control Aspects

We have already seen that the finance manager must control the levels of cash balance at various points in the organization. This task assumes special importance on account of the fact that there is generally a tendency amongst divisional managers to keep cash balance in excess of their needs.



Notes The financial managers must devise a system whereby each division of an organization retains enough cash to meet its day-to-day requirements without having surplus balances on hand. For this, methods have to be employed to:

1. Speed up the mailing time of payments from customers,
2. Reduce the time of payments received by the firm remain uncollected and speed up the movement funds to be disbursement banks.

Two very important methods to speed up collection process are:

1. Concentrating banking and
2. Lock-box system

1. ***Concentration banking:*** In concentration banking, the company establishes a number of strategic collection centers in different regions instead of a single collection center at the head office. This system reduces the period between the time a customer mails in his remittances and the time when they become spend able funds with the company. Payments received by the different collection centers are deposited with their respective local banks which in turn, transfer all surplus funds to the concentration bank of the head office. The concentration bank with which the company has its major bank account is generally located at the headquarters. Concentration banking is one important and popular way of reducing the size of the float.
2. ***Lock-box system:*** Another means to accelerate the flow of funds is a lock box system. With concentration banking, remittances are received by a collection centre and deposited in the bank after processing. The purpose of lock box system is to eliminate the time between the receipt of remittances by the company and the deposit in the bank. A lock box arrangement usually is on regional basis, which a company chooses according to its billing patterns. Before determining the regions to be used, a feasibility study is made of the possibility of cheques that would be deposited under alternative plans. In this regard, operations research techniques have proved useful in the location of lock box sites. For example, if a company divides the country into five zones on the basis of feasibility studies, it might pick up New Delhi for the North, Bombay for the West, Calcutta for the East, Madras for the South and Nagpur for the centre.

Notes

Under this arrangement, the company rents the local post-office box and authorize its bank at each of the locations to pick up remittances in the boxes. Customers are billed with instructions to mail their remittances to the lock boxes. The bank picks up the mail several times a day and deposits the cheques in the company's account. The cheques may be microfilmed for record purposes and cleared for collection. The company receives a deposit slip and lists all payments together with any other material in he envelope. This procedure frees the company from handling and depositing the cheques. Thus, the lag between the time cheques are received by the company and the time they are actually deposited in the bank is eliminated. The main drawback of lock box system is the cost of its operation. The bank provides a number of services in addition to usual clearing the cheques and requires compensation for them. Since the cost is directly proportional if average remitted is small.

Caution The appropriate rule for deciding whether or not to use a lock box system or for that matter, concentration banking is simply to compare, the added cost of the most efficient system with the marginal income that can be guaranteed from the released funds. If costs are less than income, the system is profitable, if not, the system is not a probable undertaking.

Self Assessment

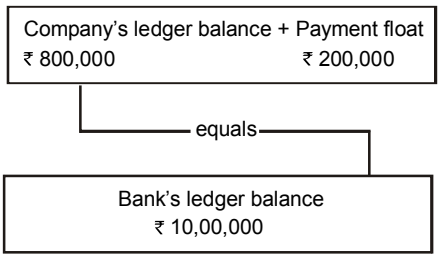
Fill in the blanks:

5. Two very important methods to speed up collection process are Concentrating banking and …… system.
6. In ……, the company establishes a number of strategic collection centers in different regions instead of a single collection center at the head office.

11.4 Cash Collection and Disbursement Systems

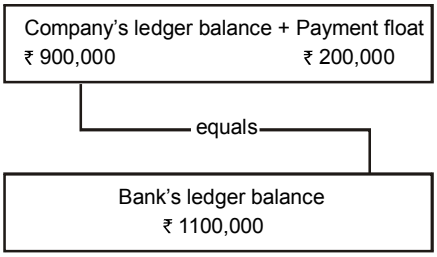
11.4.1 Concept of Float

Suppose U Co. Ltd., has ₹ 10 lakhs on demand deposit with its bank. It pays one of its suppliers by writing a cheque for ₹ 200,000. The company's ledgers are immediately adjusted to show cash balance of ₹ 80,000. But the company's bank should not know about the cheque till the supplier receives the cheque and present to the company's bank for payment. During that period, the bank continues to show in its ledger that a company has a balance of ₹ 10 lakhs. The company obtains the benefit of an extra ₹ 200,000 in the bank while the cheque is getting cleared. This sum is often called payment or disbursement float.

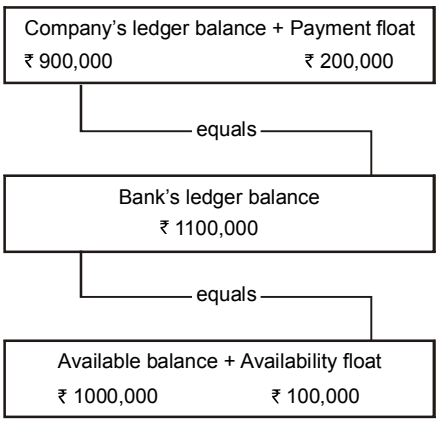


Notes

The float can also work in reverse. Suppose U Co. Ltd. receives a cheque for ₹ 100,000 from a customer. It deposits the cheque and both the company and the bank increases the ledger balance by ₹ 100,000.



But this money isn't available immediately to the company. The bank doesn't have the money till it has sent the cheque and received payment from the customer's bank. Since the bank has to wait, it makes U Co. Ltd. wait too – usually 1 or 2 business days. In the meantime, bank will show that U Co. Ltd. has an available balance of ₹ 10 lakhs and availability float of ₹ 100,000.



It may be noted that the company gains as a result of payment float and loses as a result of the availability float. The difference is often termed the net float. In our example, the net float is ₹ 100,000. The company's available balance is therefore ₹ 100,000 greater than the balance shown in its ledger.

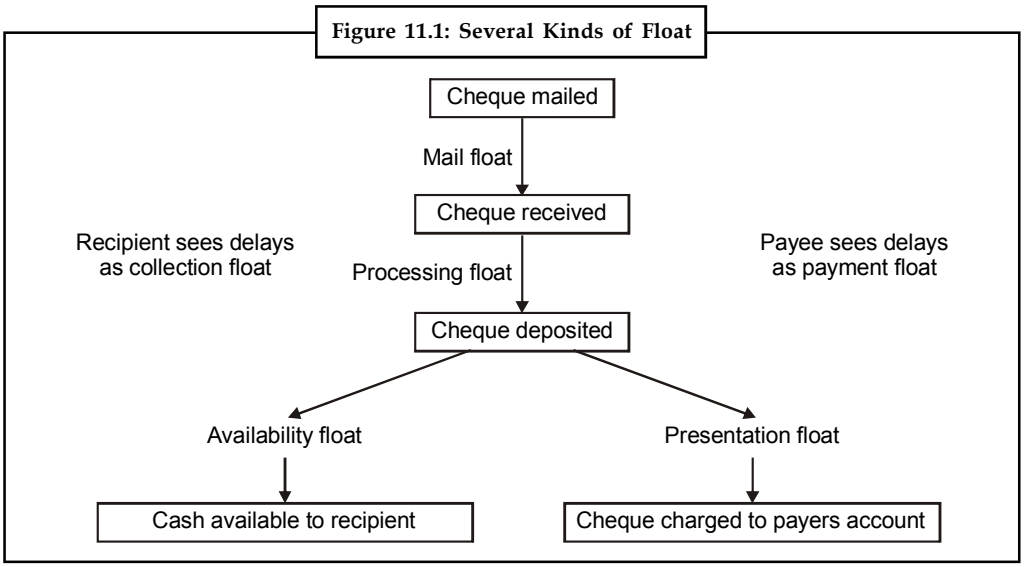
The financial manager's concern is with the available balance and not with the company's ledger balance. If it is known that it may take a week or two before some of the cheques are presented for payment, one may be able to get by with a smaller cash balance. This game is often called playing the float. One can increase the available cash balance by increasing the net float.

11.4.2 Managing Float

There are several kinds of delay and so people in the cash management refer to several kinds of float.

Notes

Figure 11.1: Several Kinds of Float



Self Assessment

Fill in the blanks:

7. The financial manager's concern is with the available balance and not with the company's …… balance.

8. One can increase the available cash balance by increasing the …….. .

11.5 Cash Management Models

In recent years, several types of mathematics models have been developed that help to determine optimum cash balance to be carried by a business organization. All these models can be put into two categories – inventory type models and stochastic models. Inventory type models have been constructed to aid the finance manager to determine optimum cash balance of the firm. However, in a situation where EOQ Model is not applicable, the stochastic model of cash management helps in determining optimum level of cash balance. It happens when the demand for cash is stochastic and is not known in advance.

11.5.1 William J Baumol's Economic Order Quantity Model

According to this model, optimum cash level is that level of cash where the carrying costs and transaction costs are the maximum. The carrying costs refer to the cost of holding cash, namely the interest foregone in marketable securities. The transaction costs refer to the cost involved in setting the marketable securities converted into cash. This happens when the firm falls short of cash and has to sell the securities resulting in clerical, brokerage, registration and other costs.

The optimum cash balance will be that point where these two costs are equal. The formula for determining optimum cash balance is:

$$C = \sqrt{\frac{2 U \times P}{S}}$$

Where, C = Optimum cash balance

U = Annual (or monthly) cash disbursement

Notes

P = Fixed cost for transaction

S = Opportunity cost of one rupee p.a.

Illustration: A firm maintains a separate account for cash disbursement. Total disbursement is ₹ 105,000 per month or ₹ 12,60,000 per year. Administrative and transaction cost of transferring cash to disbursement account is ₹ 20 per transfer. Marketable securities yield is 8% p.a. Determine the optimum cash balance as per J. Baumol's Model

Solution: The optimum cash balance

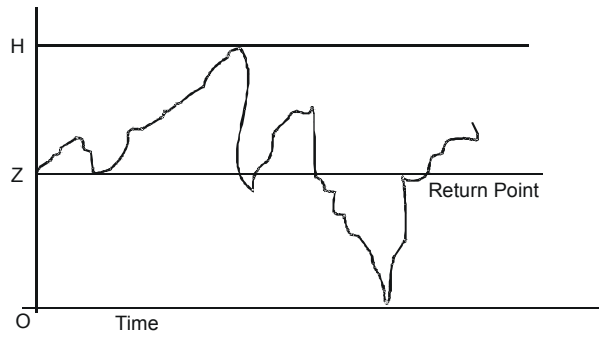
$$C = \sqrt{\frac{2 \times 12,60,000 \times 20}{0.8}}$$

$$= ₹\ 25,100$$

11.5.2 Miller-Orr Cash Management Model

According to this model, the net cash flow is completely stochastic. When changes in cash balance occur randomly the application of control theory serves a useful purpose. The Miller-Orr model is one of such control limit models. This model is designed to determine the time and size of transfers between an investment account and cash account. In this model, limits are set for cash balances. These limits may consist of h as upper limit, z as the return point and zero as the lower limit. When the cash balance reaches the upper limit, the transfer of cash equal to h is invested in marketable securities account. When it touches the lower limit, a transfer from marketable securities account to cash account is made. During the period when cash balance stays between (h,z) and (z,o) i.e., high and low limits of cash balance are set up on the basis of fixed cost associated with the securities transactions, the opportunity cost of holding cash and the degree of likely fluctuations in cash balances. These limits satisfy the demands for cash at the lowest possible total costs. The following diagram illustrates the Miller-Orr Model.

Figure 11.2: Miller-orr Cash Management Model



Self Assessment

Fill in the blanks:

9. The …….. costs refer to the cost of holding cash.
10. The …….. costs refer to the cost involved in setting the marketable securities converted into cash.

11.6 Treasury Management

Notes

Treasury management once viewed as a peripheral activity conducted by back-office, today plays a very vital role in corporate management. Treasury management can be defined in many ways. The Association of Corporate Treasure defines "Treasury management as the efficient management of liquidity and financial risk in business." All firms, to some degree, are involved in treasury management, although in smaller companies, it may not be a separately defined job.



Notes Treasury management is responsible for:

1. Management of cash while obtaining the optimum return from any surplus funds.
2. Management of exchange rate risks in accordance with group policy.
3. Providing both long-term and short-term funds for the business at minimum cost.
4. Maintaining good relationships with banks and other providers of finance including shareholders.
5. Advising on aspects of corporate finance including capital structure, mergers and acquisitions.

Functions of Treasury Department

1. ***Cash management:*** The efficient collection and payment of cash both inside the group and to third parties is the function of the treasury department. The involvement of the department with the details of receivables and payables will be a matter of policy. There may be complete centralization within a group treasury or the treasury may simply advise subsidiaries and divisions on policy (collection/payment periods, discounts, etc.,). Any position between these two extremes would be possible. Treasury will normally manage surplus funds in an investment portfolio. Investment policy will consider future heads for liquid funds and acceptable levels of risk as determined by company policy.
2. ***Currency management:*** The treasury department manages the foreign currency risk exposure of the company. In a large Multinational Company (MNC), the first step will usually be set off intragroup indebtedness. The use of matching receipts and payments in the same currency will save transaction costs. Treasury might advise on the currency to be used when invoicing overseas sales. The treasury will manage any net exchange exposures in accordance with company policy. If risks are to be minimized, then forward contracts can be used either to buy or sell currency forward.
3. ***Funding management:*** The treasury department is responsible for planning and sourcing the company's short, medium and long-term cash needs. The treasury department will also participate in the decision on capital structure and forecast future interest and foreign currency rates.
4. ***Banking:*** It is important that a company maintains a good relationship with its bankers. Treasury department carries out negotiations with bankers and acts as the initial point of contact with them. Short-term finance can come in the form of bank loans or through the sale of commercial paper in the money market.
5. ***Corporate finance:*** The treasury department is involved in both acquisition and divestment activities within the group. In addition, it will often have responsibility for investor

Notes

relations. The latter activity has assumed increased importance in markets where share price performance is regarded as crucial and may affect the company's ability to undertake acquisition activity or, if the price falls drastically, the lender it vulnerable to a hostile bid.

Self Assessment

Fill in the blanks:

11. Treasury will normally manage …… funds in an investment portfolio.
12. Treasury advise on the ……to be used when invoicing overseas sales.

11.7 The Cash Conversion Cycle

Central to short-term financial management is an understanding of the term 'Cash Conversion Cycle'.

We have discussed in the earlier unit that operating cycle encompasses two major short-term asset categories: inventory and accounts receivable. It is measured by summing the average age of inventories and average collection period.

However, the process of producing and selling a product also includes purchase of production inputs (raw materials) an account, which results in accounts payables. Accounts payable reduce the number of days a firm's resources are tied up in operating cycle. The time it takes to pay the accounts payable, measured in days is the average payment period.



Did u know? **What is cash conversion cycle?**

The operating cycle less the average payment period is referred as the Cash Conversion Cycle. It represents the amount of time the firms' resources are tied up.



Example: MAX Company, a producer of paper has annual sale of ₹ 10 lakhs, a cost of goods sold of 75% of sales, and purchases are 65% of cost of goods sold. MAX has an average age of inventory of 60 days, an average collection period of 40 days and an average payment period of 35 days. Thus, the cash conversion cycle for MAX is 65 days (60 + 40 – 35).

Funding Requirements of the Cash Conversion Cycle

Permanent versus seasonal funding needs: If the firm's sales are constant, then its investment in operating assets should also be constant, and the firm will have only a permanent funding requirement. If the firms' sales are cyclic, then its investment in operating assets will vary over time with its sales cycles and the firm will have seasonal funding requirements in addition to the permanent funding required for its minimum investment in operating assets.

Aggressive versus Conservative Seasonal Funding Strategies

1. Short-term funds are typically less expensive than long-term funds. Long-term funds allow the firm to lock in the funds over a period of time and thus avoid the risk of increases in short-term interest.
2. Long-term funding ensures that the required funds are available to the firm when needed.

Notes



Caution Short-term funding exposes the firm to the risk that it may not be able to obtain the funds need to cover its seasonal peaks.

Under the aggressive funding strategy, the firm funds its seasonal requirements with short-term debt and its permanent requirements with the long-term debt. Under a conservative funding strategy, the firm funds both its seasonal and its permanent requirement with long-term debt.

Clearly, the aggressive strategy's heavy reliance on the short-term financing makes it riskier than the conservative strategy because of interest rate swings and possible difficulties in obtaining needed short term financing quickly when seasonal peaks occur. The conservative strategy avoids these risks through the locked-in interest rate and long-term financing, but it is more costly because of the negative spread between the earnings rate on surplus fund, and the cost of the long-term funds that create the surplus. Where the firm operates between the extremes of the aggressive and conservative seasonal funding strategies depends on management's response towards risk and the strength of its banking relationships.



Task In respect of a firm, on an average, accounts receivable are collected after 80 days, inventories have an average of 100 days and accounts payable are paid approximately 60 days after they arise. Calculate the firm's cash cycle and cash turnover assuming a 360-day year.

Strategies for managing the cash conversion cycle:

1. Turnover inventory as quickly as possible without stockouts that will result in lost sales.
2. Collect accounts receivable as quickly as possible without losing sales from high-pressure collection techniques.
3. Manage mail, processing and clearing time to reduce them when collecting from customers and to increase them when paying suppliers.
4. Pay accounts payable as slowly as possible without damaging the firm's credit rating.

Self Assessment

Fill in the blanks:

13. Accounts payable reduce the number of days a firm's resources are tied up in …… cycle.
14. Under a …….. funding strategy, the firm funds both its seasonal and its permanent requirement with long-term debt.

11.8 Management of Marketable Securities

Management of marketable securities is an integral part of investment in cash as this may serve both the purposes of liquidity and cash provided choice of investment is made correctly. As the working capital needs are fluctuating, it is possible to park excess funds in same short-term securities, which can be liquidated when need for cash is felt. The selection of securities should be guided by three principles:

1. ***Safety:*** Returns and risks go hand in hand. As the objective of this investment is ensuring liquidity, minimum risk is the criterion for selection.

Notes

2. ***Maturity:*** Matching of maturing and forecasted cash needs is essential. Prices of long-term securities fluctuate more with changes in interest rates and are therefore, more risky.

3. ***Marketability:*** It refers to the convenience, speed and cost at which a security can be converted into cash. If the security can be sold quickly without loss of time and price, it is highly liquid or marketable.

The choice of marketable securities is mainly limited to government treasury bills, deposits with banks and inter-corporate deposits, units of Unit Trust of India and Commercial paper of corporates are other attractive means of parking surplus funds for companies along with deposits with sister concerns or associate companies.



Example: (On cash budget)

1. The following results are expected by XYZ Ltd. By quarter next year in thousands of rupees:

	Quarter			
	1	**2**	**3**	**4**
Sales	7,500	10,500	18,000	10,500
Cash Payments				
Production Costs	7,000	10,000	8,000	8,500
Selling, administration and other costs	1,000	2,000	2,900	1,600
Purchase of plant and other fixed assets	100	1100	2100	2100

Debtors at the end of the quarter are one-third of sales of the quarter. The opening balance of debtors is ₹ 30,00,000. Cash on hand at the beginning of the year is ₹ 650,000 and the desired maximum balance is ₹ 500,000. Borrowings are made at the beginning of the quarters in which the need will occur in multiples of ₹ 10,000 and are repaid at the end of quarters. Interest charges may be ignored. You are required to prepare:

(a) A cash budget by quarters – for the year and

(b) State the amount of loan outstanding at the end of the year

Solution: Cash budget next year (quarter wise) ₹ (000)

	Quarter				
	1	**2**	**3**	**4**	**Total**
(A) Cash inflows					
Collection from debtors					
1. From prior quarter (1/3 of sales)	3000	2500	3500	6000	15000
2. From current quarter (2/3 of sales)	5000	7000	12000	7000	31000
	8000	9500	15500	13000	46000
(B) Cash outflows					
Production costs	7000	10000	8000	8500	33500
Selling, admn. and other costs	1000	2000	2900	1600	7500
Plant and other fixed assets purchased	100	1100	2100	2100	5400
Total cash payments	8100	13100	13000	12200	46400

Contd...

Notes

(C) Surplus/(deficiency)	(100)	(3600)	2500	800	(400)
Beginning balance	650	550	500	500	650
Ending balance (indicated)	550	(3050)	3000	1300	250
Borrowing required (deficiency + min. cash reqd.)		3550			3550
Repayment mode (balance – min. cash reqd.)			(2500)	(800)	(3300)
Ending balance	550	500	500	500	500

Loan outstanding is ₹ 35,50,000 – ₹ 33,00,000 = ₹ 250,000

Example: A firm uses a continuous billing system that results in an average daily receipt of ₹ 40,00,000. It is contemplating the institution of concentration banking, instead of the current system of centralized billing and collection. It is estimated that such a system would reduce the collection period of accounts receivable by 2 days.

Concentration banking would cost ₹ 75,000 annually and 8% can be earned by the firm or its investments. It is also found that a lock-box system can reduce its overall collection time by four days and could cost annually ₹ 120,000.

1. How much cash would be released with the concentration banking system?
2. How much money can be saved due to reduction in the collection period by 2 days? Should the firm institute the concentration banking system?
3. How much cash would be freed by lock-box system?
4. Between concentration banking and lock-box system, which is better?

Solution:

1. Cash released by the concentration banking system = ₹ 40,00,000 × 2 days = ₹ 80,00,000
2. Savings = 8% × ₹ 80,00,000 = ₹ 640,000. The firm should institute the concentration banking system. It costs only ₹ 75,000 while the savings expected are ₹ 640,000.
3. Cash released by the lock-box system = ₹ 40,00,000 × 4 days = ₹ 160,00,000

   Savings in lock box system 8% × ₹ 160,00,000 = ₹ 12,80,000
4. Lock-box system is better. Its net savings ₹ 11,60,000 (₹ 1280,000 – ₹ 120,000) are higher than that of concentration banking.

Example: Assume, a firm which purchases raw materials on credit is required by the credit terms to make payments within 60 days. The firm's experience has been that it takes on an average, 35 days to pay its accounts payable and 70 days to collect its accounts receivable. Moreover, 85 days elapse between the purchase of raw materials and the sale of finished goods, that is to say, the average age of a firm's inventory is 85 days. What is the firm's cash cycle? Also estimate the cash turnover.

Solution: The cash cycle of the firm can be calculated by finding the average number of days that elapses between the cash outflows associated with paying accounts payable and the cash inflows associated with collecting accounts receivable ,i.e.,

1. Cash cycle =85 days +70 days - 35 days =120 days

Notes

2. Cash Turnover = the assumed number of days in a year divided by the cash cycle = 365/120= 3.04



Example: The under mentioned facts are available:

1. Cash turnover rate 4.5
2. Annual cash outflow ₹ 175,000
3. Accounts payable can be stretched by 20 days

What would be the effect of stretching accounts payable on the minimum operating cash requirement?

Assuming the firm can earn 8% on its investments, what would be the saving on cost?

Solution: Cash turnover 4.5 i.e., 360/4.5 i.e., 80 days and annual cash outflow ₹ 175,000 hence cash requirement = 175000/4.5 = ₹ 38,889.

With accounts payable stretching by 20 days, cash cycle will be 80+20 days i.e., 100 days, cash turnover 360/60 =6 times, hence cash requirement will change to ₹ 175,000/6 = ₹ 29,167.

Cash requirement will reduce by ₹ 38,889 - ₹ 29,167 = 9,722 and savings in cost will be 8% on 9722 = ₹ 778.

Self Assessment

Fill in the blanks:

15. The selection of securities should be guided by three principles which are ……., Maturity and Marketability.
16. ……. refers to the convenience, speed and cost at which a security can be converted into cash.



Case Study

Bajaj Electronics – Cash Forecasting

This case tests the reader's ability to develop a basic cash forecast for a firm and prepare a recommendation for backup financing over a period of 12 months.

A leading producer of telecommunications components and a major contender in shorter antennas is Bajaj Electronics Company. Bajaj's business has grown tremendously in recent years despite increased competition. The primary reasons for increased growth are technological advancement that have expanded production capacity, an aggressive marketing effort, and a reputation for quality products and excellent service.

Loofer, the financial analyst for the company, has been assigned the task of preparing a quarterly cash forecast for the next fiscal year. After checking with marketing, he was given a monthly breakdown of actual sales for last month and the current month and the current month and a forecast for the next 12 months. These are given in Table 1 and reflect the somewhat seasonal nature of the firm's marketing activities.

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Notes

Table 1: Actual and Forecast Sales from Marketing

Month	Actual Credit Sales	Forecast Sales
November	$ 4,338,000	
December	5,204,000	
January		$ 4,600,000
February		4,500,000
March		4,500,000
April		52,00, 000
May		5, 000, 000
June		4,700, 000
July		6, 000, 000
August		6,000,000
September		5,800,000
October		4,500,000
November		4,600,000
December		4,600,000

From the accounting department, Loofer obtained information on the historical mix of sales and collection information. During the first half of the year, credit sales generally mad up about 80 per cent of all sales. In the second half, this dropped to 75 per cent. With respect to the credit sales, collection patterns varied seasonally. This information is contained in Table 2. Once again, the collection pattern is also seasonal Note, however, that the collections do not total to 100 per cent of credit sales. This is the case because the firm allows a margin for bad debts and unexpected collection costs.

The firm follows a unique and highly controlled system for its trade payables. Each month during the first half of the year, the accounts payable section pays suppliers cash equal to 50 per cent of the monthly sales. During the second half of the year, this rises to 55 per cent. Over a full year, this pattern of payment seems to be adequate to pay all bills. At times, suppliers are pressing for more payments and some maneuvering is needed. Still, this policy assists the firm's cash management during the busy third quarter and will be followed next year.

Cash operating expenses are paid as they occur. During the first and fourth quarters, they are estimated at 50 per cent of sales. During the second and third quarters, they rise to 55 per cent of sales.

Loofer knows that the firm includes the impact of interest and taxes in its operating cash flow forecasts. The levels of such debt, along with the forecasted average interest rate for each month, are given in Table 3. Interest will be calculated to reflect changes in debt levels.

The firm pays estimated tax payments monthly at a 35 per cent rate. It uses a cost of goods sold estimate at 50 per cent of sales, not including depreciation. Loofer assumes that monthly depreciation for the next year will be $ 185,000.

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Notes

Table 2: Collection Pattern of Receivables

Months	Percent of Credit Sales		
	Collected in Same Month	Collected One Month Later	Collected Two Months Later
November	0.20		
December	0.60	0.15	
January	0.20	0.60	0.15
February	0.30	0.60	0.50
March	0.25	0.60	0.10
April	0.25	0.60	0.10
May	0.15	0.60	0.20
June	0.20	0.60	0.15
July	0.10	0.60	0.25
August	0.20	0.60	0.15
September	0.15	0.60	0.20
October	0.20	0.60	0.15
November	0.15	0.60	
December	0.10		

Table 3: Debt Forecast, Last Day of Each Month, and Average Monthly Interest Rates

Months	Interest-Bearing Debt (,000s)	Interest Rate
December	1600	
January	1800	0.120
February	1500	0.100
March	1600	0.110
April	1500	0.100
May	1600	0.110
June	1500	0.100
July	1500	0.090
August	1400	0.080
September	1300	0.090
October	1400	0.080
November	1200	0.095
December	1600	0.095

The final information for the forecast involves establishing a safety level. The firm requires cash or equivalents equal to 20 per cent of the monthly cash operating expenses. The firm began the year with $6,10,000 in the form of cash and equivalents.

Question

Prepare a statement showing cash forecast for the next 12 months, and in case where firm needs additional cash, draw the recommendation with the tune of credit that must be arranged from bank.

Notes

11.9 Summary

- The four motives for holding cash are Transaction need, Speculative needs, Precautionary needs and Compensation motive.
- The exact nature of a cash management system would depend upon the organizational structure of an enterprise.
- Cash budget represents cash requirements of business during the budget period.
- Two very important methods to speed up collection process are Concentrating banking and Lock-box system.
- The financial manager's concern is with the available balance and not with the company's ledger balance.
- According to William J. Baumol's Economic Order Quantity model, optimum cash level is that level of cash where the carrying costs and transaction costs are the maximum.
- According to Miller-Orr Cash Management model, the net cash flow is completely stochastic.
- Treasury management is the efficient management of liquidity and financial risk in business.
- The operating cycle less the average payment period is referred as the Cash Conversion Cycle. It represents the amount of time the firms' resources are tied up.
- Management of marketable securities is an integral part of investment in cash. The selection of securities should be guided by three principles which are Safety, Maturity and Marketability.

11.10 Keywords

Cash: It is one of the components of current assets and a medium of exchange for the purpose of transactions.

Cash Budget: It is a statement showing the estimated cash inflows and cash outflows over a planning period.

Conversion Costs: It is the costs that are associated with the sales of marketable security.

Float: It is the amount of the money tied up in cheques that have been written but not yet collected.

Optimal Cash Balance: It is that cash balance where the firm's opportunity cost equals transactions cost and the total cost is minimum.

11.11 Review Questions

1. Explain the Baumol's Model of Cash Management.
2. Write short notes on Lock box system and Concentration banking.
3. What is the difference between the firm's operating cycle and its cash conversion cycle?
4. Why it is helpful to divide the funding needs of a seasonal business into its permanent and seasonal funding requirements when developing a funding strategy?

Notes

5. What are the benefits, costs and risks of an aggressive funding strategy and of a conservative funding strategy? Under which strategy is the borrowing often in excess of the actual need?
6. "Cash budgeting or short-term cash forecasting (budgeting) is the principal tool of cash management." Discuss.
7. Efficient cash management will aim at maximizing the cash inflows and slowing cash outflows". Discuss.
8. Briefly discuss the various avenues or opportunities available to the companies to park their surplus funds for a short-term.
9. Analyse the importance of the preparation of the cash budget for the corporates.
10. "Management of cash flows plays a very important role in cash management". Discuss.

Answers: Self Assessment

1.	Speculative	2.	organizational structure
3.	Cash budget	4.	cash flow
5.	Lock-box	6.	concentration banking
7.	ledger	8.	net float
9.	carrying	10.	transaction
11.	surplus	12.	currency
13.	operating	14.	conservative
15.	Safety	16.	Marketability

11.12 Further Readings



Books

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Unit 12: Inventory Management

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Objectives

After studying this unit, you will be able to:

- Recognize the meaning of inventory;
- Describe the role of inventory in working capital;
- Explain the various techniques of inventory management;
- Discuss the valuation of materials and inventories.

Introduction

The term 'inventory' refers to the stockpile of the product a firm is offering for sale and the components that make up the product. In other words, inventory is composed of assets that will be sold in the future in the normal course of business operations. The assets which firms store as inventory in anticipation of needs are: (1) raw materials (2) work in process (semi-finished

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goods) and (3) finished goods. The raw material inventories certain items that are purchased by the firm from others and are converted into finished product through manufacturing (production) process. They are an important impact of the final product. The work in progress is normally, partially or semi-finished goods, at the various stages of production in a multi-stage production process. Finished goods represent final or completed products, which are available for sale. The inventory of such goods consists of items that have been produced but are yet to be sold.

Inventory, as a current asset, differs from other current assets because it is not finance managers who alone are involved here. Rather, all the functional areas in finance, marketing, production and purchasing are involved.

12.1 Role of Inventory in Working Capital

Inventories are components of the firm's working capital and as such represent current asset. Some characteristics that are important in the broad context of working capital management include:

1. ***Current asset:*** It is assumed that inventories will be converted into cash in the current accounting cycle, which is usually one year. There are exceptions to this e.g., wine may be kept in casks or bottles for many years for the proper formation of the product. A manufacturer of fine pianos may have a production process that exceeds one year.
2. ***Level of liquidity:*** Inventories are considered as a source of near cash for more of the products. Some firms at some time may hold some slow moving items that may not be sold for a long time. With chronic slowdown or changes in the markets for goods the prospects for sale of entire product lines may be diminished. In these cases, the liquidity aspects of the inventories become important to the manager of working capital. Firms must keep a reasonable margin for uncertain operating environments, the analysis must discount the liquidity value of the inventories significantly.
3. ***Liquidity Lag:*** Inventories are tied to the firm's pool of working capital through three specific lags, namely:
    (a) *Creation lag:* In majority of cases, inventories are purchased on credit, creating an account payable, when the raw materials are processed in the factory, cash is paid for production expenses for the requirement during the period, labour is paid on pay day, utility bill for electricity is paid after the bill is submitted, Or for goods purchased for resale, the firm may have 30 or more days to hold the goods before payment is due.
    (b) *Storage lag:* Once goods are available for sale, they will not be immediately converted into cash by sealing even when sales are moving fast, the firm will hold inventory as a back up. Thus the firm will usually pay suppliers, workers, utility and other overhead expenses before the goods are actually sold. This lag represents a cost to the firm.
    (c) *Sale lag:* Once goods have been sold, they normally do not create cash immediately. Most sales occur in credit and accounts receivable is created. The firm has to wait to collect receivables. This lag also represents a cost to the firm.
4. ***Circulating activity:*** Inventories get rotated with other current assets. They get converted into cash and then invested again in inventory to continue the operating cycle.

Notes

12.1.1 Purpose of Inventories

The specific benefit that accrue from holding inventories can be identified as follows:

1. ***Avoiding lost sales:*** In most cases, a firm must be prepared to deliver goods on demand without goods on hand which are ready to be sold, most firms would lose business. Shelf stock refers to items that are stored by the firm and sold with little or no modifications to customers. An automobile is an item of shelf stock even though customers may specify minor variations, the basic item leaves a factory and is sold as a standard item. The same situation exists for many items of heavy machinery, consumer products and high industrial goods.
2. ***Getting quantity discounts:*** Due to bulk purchases many suppliers will reduce the price of suppliers and component parts or may offer discounts.
3. ***Reducing orders costs:*** By reducing the number of orders, the administration costs for raising purchase orders, acceptance and inspection note gets reduced.
4. ***Achieving efficient production runs:*** Frequent setups produce high start up costs, longer runs involve lower costs.

   Inventories provide a 'buffer' between purchasing, producing and marketing goods. Raw materials and other inventory items can be purchased at appropriate times and in proper amounts to take advantage of economic conditions and price incentives. The manufacturing process can occur in sufficiently long production runs and with pre-planned schedules to achieve efficiency and economies.
5. ***Reducing risk of production shortages:*** Manufacturing from produced goods with hundred or even thousands of components. One of them, however, small it may be, is to be in stock if the production is to be continued for a longer spell.
6. In-process inventory provides flexibility in production scheduling so that an efficient schedule and high utilization of capacity may be attained within in process inventory; a bottleneck at any stage in the production process renders idle the machines and facilities at subsequent stages.
7. Finished goods inventory enables a firm to double its production programme and marketing activities so that desirable results can be achieved on both the fronts. If finished goods inventory is available, the marketing department can meet the needs of customer promptly, irrespective of the quantity and composition of goods flowing out of the production time currently.

12.1.2 Types of Inventory

Four types of inventories may be identified:

1. ***Raw material inventory:*** This consists of basic materials that have not been committed to production in a manufacturing firm. Raw materials that are purchased from time-to-time to be used in the firm's production operation range from iron ore awaiting processing into steel to electronic components to be incorporated into stereo amplifiers. The purpose of maintaining raw material inventory is that material is taken up for production immediately so as to avoid delays in shipment of raw materials and thereby avoid production delays.
2. ***Stores and spares:*** These are materials/accessories which are incidental to the consumption of Indian products and can be purchased at bulk quantity.

Notes



Example: bolts, nuts, clamps, screws, etc.,

These spare parts are usually bought from outside or sometimes they are manufactured within the company too. This category also includes those products, which are produced in addition of the main products for the purpose of sale.

3. ***Work-in-process inventory:*** This category includes these materials that have been committed to the production process but have not been completed. The more complex and lengthy the production process, the larger will be the investment in work-in-process inventory.

4. ***Finished goods inventory:*** These are completed products awaiting sale. The purpose of a finished goods inventory is to couple the products and sales functions so that it no longer is necessary to produce the goods before a sale can occur.

The nature of inventory planning and control: Inventory must be sold in order to generate revenue. In a manufacturing firm, raw materials must first be converted into finished goods before products can be sold. Money invested in inventory cannot be invested in other earning as sets such as production or sales facilities. Therefore, it is necessary to ensure that excessive amounts of resources are not invested in inventories.

The purpose of inventory management is to minimize the cost of inventory without impairing the efficient flow of production and sales activities. Inventory decisions are affected by the cost of ordering inventory and the cost of carrying inventory as well as by the costs of not having enough inventories in hand. Below are common types of inventory costs that are not incurred in relation to the actual cost of the inventory itself:

Inventory ordering costs: Inventory ordering costs include:

1. Cost of acquiring recent price quotations
2. Costs of preparing and approving a purchase order
3. Cost of receiving shipments and checking against purchase orders
4. Cost of recording to purchase and moving the new inventory into storage.

Inventory carrying costs: Included under this category are:

1. Cost of money invested in inventory
2. Heat, length, power and depreciation costs for inventory storage facilities
3. Inventory handling costs
4. Inventory insurance costs
5. Cost of taxes in inventory
6. Costs of spoilage, obsolescence and deterioration.

Inventory storage costs: The following are included in these costs:

1. Cost of lost sales
2. Cost of inefficient production runs
3. Cost of substituting more expensive raw materials
4. Penalty costs for late completion of contracts.

Notes

Inventory ordering costs and inventory carrying costs are used to compute the optimum size inventory. Inventory shortage costs are included in determining the optimum reorder point for inventory items.

Reorder point: The economic order quantity provides a manager with information about the optimum order size for a particular item of inventory but it does not provide information about when the order should be placed. The reorder point is the inventory level of which the order is placed. If a firm has the ability to buy and receive inventory items instantly, a new order is placed when there are no more units on hand.

Unfortunately, few firms are able to get instant deliveries. Sometime is required between placing an order and receipt of the goods. This time period is called lead-time. If the lead-time is known and daily demand is known, the reorder point is easy to find.



Example: SWT Company has a lead-time of 8 days for tyre orders. The daily demand is 50 tyres. The lead-time demand or demand during lead-time is 8 × 50 = 400 tyres. If the company plans to receive a new tyre shipment just as the inventory reaches zero, it should place an order when the inventory level reaches 400 tyres. A new order is placed at an inventory level of 400 tyres, 8 days before inventory reaches zero.

12.1.3 Inventory under Uncertainty and Safety Stock

The use of lead-time and lead-time demand in the analysis of reorder point assumes a known constant demand and lead-time often one or both of these fluctuate and are not known. Demand in particular is difficult to predict, because it can change from day-to-day. Delivery of inventory is affected by the suppliers inventory levels and operating efficiency, as well as, by variations in delivery schedules of common carriers.

When lead-time or demand is uncertain, the analysis of the inventory reorder point is complicated. There may be a situation of possibility of remaining out of inventory, which is known as stockout. Running out of stock involves cost by way of lost profit in potential sales, customers ill will, or the loss of the customer altogether. Raw materials inventory stockouts may cause expensive start up costs, production inefficiencies, a switch to more expensive raw materials or penalty costs for late delivery of contracted goods. Often, it is difficult to estimate stockout costs.

In order to avoid stockout costs, firms sometimes carry a safety stock, which is additional inventory above what is needed. Safe stock is a cushion that the management uses to avoid on interruption of normal activities due to stockouts.

The optimum inventory strategy is to increase safety stock as long as cost of carrying the additional inventory is less than the expected cost of stockouts. The expected stockout cost is the cost of the stock out multiplied by its probability of occurring.



Example: Gross margin is ₹ 35 per unit. Expected demand of 50 units per day means that a 1-day stock-out results in a stock out cost of ₹ 35 × 50 or ₹ 1,750. Management estimates that with the safety stock, there is a 30 per cent chance of stock out. The expected cost of a stockout is:

$$\text{Expected stockout} = \text{stock out cost} \times \text{probability of stockout}$$

$$= ₹\,1750 \times 0.30 = ₹\,525$$

The optimum strategy is to carry enough safety stocks that the cost of carrying the safety stock equals the expected cost of a stock out with a carrying cost of ₹ 12 per unit; the optimum safety stock is (525/12) i.e., 44 tyres. With a 30 per cent chance of a stockout, the arbitrary 100-unit safety

Notes

stock is excessively sophisticated-Statistical models may be developed to address the issue of optimum safety stocks and reorder points.

Self Assessment

Fill in the blanks:

1. Inventory ordering costs and inventory carrying costs are used to compute the …….. inventory.
2. Inventories are tied to the firm's pool of working capital through three specific lags, namely Creation lag Storage lag and …….. .
3. In order to avoid stockout costs, firms sometimes carry a ……., which is additional inventory above what is needed.

12.2 Inventory Management

The main objective of inventory management is to achieve maximum efficiency in production and sales with the minimum investment in inventory.

Inventory consists of stock of materials, components, work-in-progress, finished products and stores and spares. The techniques commonly used for inventory management are as follows:

1. Setting of various stock levels
2. ABC analysis
3. Establishment of system of budgets
4. Use of perpetual inventory records and continuous stock verification
5. Determination of economic order quantity
6. Review of slow and non-moving items
7. Use of control ratios
8. Just-in-time (JIT) System
9. Material Requirement Planning (MRP) system

Self Assessment

Fill in the blanks:

4. Inventory consists of stock of materials, components, work-in-progress, finished products and …….. .
5. The objective of inventory management is to achieve maximum efficiency in production and sales with the …….. investment in inventory.

12.3 Various Techniques of Inventory Management

12.3.1 Setting of Various Stock Levels

Minimum level: It indicates the lowest figure of inventory balance which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability of inventory.

Notes

Main consideration for fixation of minimum level of inventory:

1. Information about maximum consumption and maximum delivery period in respect of each item to determine its reorder level.
2. Average rate of consumption for each inventory item.
3. Average delivery period for each item. Average delivery period = ½ (maximum period + minimum period)

Formula:

Minimum level of inventory = Reorder level – (Average rate of consumption × Average time of inventory delivery)

Maximum level: It indicates figure of inventory quantity held in stock at any time.

The following are the considerations that govern the fixation of maximum level for various inventory items:

1. It's reorder level. The reorder itself depends on the maximum rate of consumption and maximum delivery period.
2. The knowledge about minimum consumption and minimum delivery period for each inventory item.
3. The figure of economic order quantity.
4. The availability of funds, storage space, nature of item and their price per unit are also important.
5. For imported material since of their irregular supply, the maximum level should be high.

Formula used for Calculation of Maximum Level of Inventory = Reorder level × Reorder quantity – (Minimum Consumption × Minimum reorder period)

Reorder level: This level is between minimum and maximum levels, such that before the material ordered is received into stores, there is sufficient quantity on hand to cover with normal and abnormal consumption situations. It is the level at what order for replenishment of stock should be placed.

The formula used for its calculation is as follows:

Reorder level = Maximum reorder period × Maximum Usage (or)

= Minimum level + (Avg. rate of consumption × Avg. time to obtain fresh supplies)

Now Avg. inventory level = Maximum level + ½ Reorder quantity

OR $= \frac{\text{Maximum level + Minimum level}}{2}$



Did u know? **What is Danger Level?**

It is the level at which normal issues of raw material inventory are stopped and emergency issues are only made.

Danger Level = Avg. Consumption × Lead time for emergency Purchases

Notes



Example: Two components, A and B, are used as follows:

Normal usage	100 units/week
Maximum usage	150 units/week
Minimum usage	50 units/week
Reorder quantity	A 600, B 1000
Reorder period	A 4 to 6 weeks
	B 2 to 4 weeks

Calculate for cash component (i) Reorder level

(ii) Minimum level

(iii) Maximum level

(iv) Average Stock level

Solution:

1. Reorder level = Maximum usage/week × Maximum delivery period

Reorder level for A = 150 units × 6 = 900 units

Reorder level for B = 150 units × 4 = 600 units

2. Minimum level = Reorder level – (Normal usage × Avg. period)

$$\text{Minimum level for A} = 900 \text{ units} - 50 \text{ units} \times \frac{(4+6)}{2}$$

= 900 units – 250 units = 650 units

$$\text{Minimum level for B} = 600 \text{ units} - 50 \text{ units} \times \frac{(2+4)}{2} = 450 \text{ units}$$

3. Maximum level = Reorder level + Reorder Qty – (Min. consumption × Min. reorder period)

Maximum level for A = (900+600) – (50 units × 4 weeks)

= 1500 – 200 = 1300 units

Maximum level for B = (600+1000) – (50units × 2) = 1500 units

4. Average stock level = ½ (minimum + maximum stock level) Average stock for component A = ½ (650 + 1300) = 975

Average stock for component

B = ½ (450 + 1500) = 975

12.3.2 ABC Analysis (called Always Better Control)

It is a system of inventory control where discriminating control is exercised over different items of stores classified on the basis of investment involved. Usually, the items are divided into three categories according to their importance, namely their value and frequency of replenishment during a period.

Notes

1. 'A' category of items consists of only a small percentage i.e., about 10% of the total items handled by the stores but require heavy investment (in rupee value) about 70% of the total inventory value.
2. 'B' category of items (relatively less important) constitutes 20% of the total items handled by stores, having an investment (in rupee value) of about 20% of the total inventory value.
3. 'C' category consists of large number of items handled by stores say 70%, having relatively small investment say 10% of the total inventory value.

'A' category of items is controlled effectively by using a regular system, which ensures neither overstocking nor shortage of materials for production. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and reorder level. Reduction in inventory management costs is achieved by determining economic order quantity. To avoid shortage and to minimize heavy investment in inventories, the techniques of value analyses, variety reduction, standardization etc., are used.

In case of 'B' category of items, less degree of control as applicable to 'A' category items are warranted. The orders for the items, belonging to this category, may be placed after reviewing the situation periodically.

For 'C' category of items, there is no need of exercising constant control. Orders for these items are placed either at 6 months interval or yearly interval, depending on the consumption pattern. In this case, the objective is to economize an ordering and handling costs.



Example:

Category	Cost Range ₹	Total No. of Items	Total Cost ₹
C	1-500	12,000	10,00,000
B	501-2000	2,000	15,00,000
A	2001 – 100,000	1,000	100,00,000
		15,000	125,00,000

Percentage of total items and costs

Category	% of total Items	Cumulative % of Total Items	Percentage of Total Cost	Cumulative % of the Total Cost
A	7	7	80	80
B	13	20	12	92
C	80	100	8	100

12.3.3 Establishment of System of Budget

To control investment in inventories, it is necessary to know in advance about the inventories requirements during a specific period, usually a year. The exact quantity of various types of inventories and the time when they would be required can be known by studying carefully production plans and production schedules. Based on this, inventories requirement budget can be prepared. Such a budget will discourage the unnecessary investment in inventories.

Notes

12.3.4 Use of Perpetual Inventory Records and Continuous Stock Verification

Perpetual inventory represents a system of records maintained by the stores department. It comprises Bin Cards and Stores Ledger.

Bin cards maintain quantitative records of receipts, issues and closing balances of each item of stores. Separate bin cards are maintained for each item. Each card is filled up with the physical movement of goods i.e., on its receipt and issue.

Like bin cards, the stores ledger is maintained to record all receipts and issue transaction in respect of materials. It is filled up with the help of goods received note and material issue requisitions.

A perpetual inventory is usually checked by a programme of continuous stock taking. Continuous stocktaking means the physical checking of these records (which are maintained under perpetual inventory) with actual stock. Perpetual inventory is essential for material control. It helps continuous stocktaking.

Stock verification may be periodical or continuous. Annual stock taking has certain inherent shortcomings e.g., all the items have to be covered in a given number of days, either the production dept. has to be shut down during these days to enable thorough checking of stock, or else the verification has to be of limited character. On the other hand, the system of continuous stocktaking consists of counting and verifying the number of items daily throughout the year, so that during the year all the items of stores are covered three or four time. The stock verifiers are independent of stores and stores staff has no knowledge as to the particular items that are being checked on a particular date.

12.3.5 Determining Economic Order Quantity

Economic Order Quantity (EOQ) is the order size for some particular inventory item that results in lowest total inventory cost for the period. Total inventory cost consists of inventory ordering cost and investment carrying cost. An EOQ may be computed for each inventory item.

EOQ assumes that the relevant costs of inventory can be divided into order costs and carrying costs (the model excludes the actual cost of the inventory). Each of them has certain key components and characteristics. Order costs include the fixed costs of placing and receiving orders, the cost of writing, a purchase order, of processing the resulting paper work, and of receiving an order and checking it against the invoice. Order costs are stated in rupees per order. Carrying costs are the variable costs per unit of holding an item of inventory for a specific period of time. Carrying costs including storage costs, insurance costs, the cost of deterioration and obsolescence, and the opportunity or financial costs of having funds invested in inventory these costs are stated in Rupees per unit per period.

Order costs decrease as the size of the order increases. Carrying costs, however, increase with increases in order size. The EOQ model analyzes the trade-off between order costs and carrying costs to determine the order quantity that minimizes the total inventory cost.

Several methods for finding EOQ are available. One is trial and error, which requires computing the total inventory cost at various order sizes. Eventually, the EOQ can be found or closely approximated by repeating the computation enough time. Another approach is to graph the cost. Although both methods can be used, the first is time-consuming and the second lacks precision.

Notes

A third approach is to calculate the optimum order size mathematically using a method called the Economic Order Quantity (EOQ) model, which yields the optimum order quantity with a single set of calculations. The model is:

$$EOQ = \sqrt{\frac{2AS}{C}}$$

Where, A = Annual usage units

S = Ordering cost per order

C = Inventory carrying cost per unit per annum

Notes The EOQ model rests on the several important assumptions:

1. There is a known constant demand.
2. Ordering costs are known and remain constant.
3. Carrying costs are known and remain constant.
4. Production and inventory capacity is unlimited.

Example: SWT Company, which is open Monday through Friday except for a 2-week vacation period and 10 holidays. The firm operates a total of 240 business days a year. Below is given the demand and cost data for its most expensive steel belted radial tyre.

Avg. daily demand	50;	Selling price	₹ 95/tyre
Cost	₹ 60/tyre;	Ordering cost	₹ 500/order
Carrying cost	20 per cent of unit cost		

A = 50 tyres a day × 240 business days = 12000

S = Cost of ordering is ₹ 500 per order,

C = 20% × ₹ 60 i.e., ₹ 12 per unit

$$\text{Hence EOQ} = \sqrt{\frac{2 \times 1200 \times 500}{60 \times 0.2}}$$

$$\sqrt{1000,000} = 1000 \text{ tyres}$$

Hence, Economic Ordering Size is 1000 tyres

$$\text{Number of order} = \frac{A}{EOQ} = \frac{12000 \text{ units}}{1000 \text{ units/order}} = 12 \text{ orders}$$

$$\text{Ordering Cost} = \frac{A}{EOQ} \times S = \frac{12000 \times 500 \text{ per oder}}{1000 \text{ units per order}} = ₹\ 6000$$

Carrying cost is function of average amount of inventory on hand multiplied by the carrying cost rate. The average inventory on hand is the order size divided by 2.

$$\text{Average inventory} = \frac{EOQ}{2} = \frac{1000 \text{ units}}{2} = 500 \text{ units}$$

$$\text{Carrying Cost} = \frac{EOQ}{2} \times C = \frac{1000}{2} \times 60 \times 0.2 = ₹\ 6000$$

Notes

At the EOQ, the cost of ordering for the period (₹ 6000) equals the carrying cost for the period (₹ 6000).

Statement showing total inventory cost at different order size is given below:

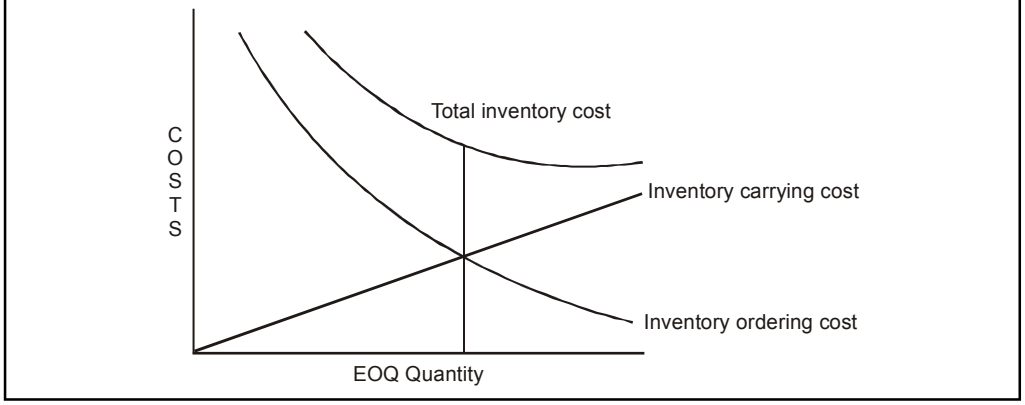
SWT Company

Schedule of Inventory Costs at Various Order Sizes

Order Size	400	600	800	1000	1200	1400	1600
Avg Inventory Size	200	300	400	500	600	700	800
No. of Inventory Orders	30	20	15	12	10	8.6	7.5
Ordering Cost	₹ 15000	₹ 10000	₹ 7500	₹ 6000	₹ 5000	₹ 4300	₹ 3750
Carrying Cost	2400	3600	4800	6000	7200	8400	9600
Total Inventory Cost	17400	13600	12300	12000	12200	12700	13350

The above statement also shows that total inventory cost is least at order size of 1000. Any order sizes other than EOQ level yields a higher total inventory cost.

Figure 12.1: EOQ Quantity



The above diagram gives the inventory ordering and carrying cost. As the order size is increased the inventory order cost decreases and the total inventory carrying cost increases. Minimum total is reached at the order size for which ordering costs equal carrying cost i.e., the intersection of inventory ordering cost curve and inventory carrying cost curve.

12.3.6 Review of Stores and Non-moving Items

Sometimes, due to high value of slow moving and non-moving raw materials it appears that the concern has blocked huge sum of money unnecessarily in raw materials. To overcome this problem, it is necessary to dispose off as easily as possible, the non-moving items, till the existing stock is exhausted. Computation of inventory turnover ratio may help in identifying slow moving items.

12.3.7 Use of Control Ratios

1. ***Input-output ratio:*** Inventory control can also be exercised by the use of input-output ratio. Input Output ratio is the ratio of the quantity of input of material to production and the standard material content of the actual output. This ratio enables comparison of actual

Notes

consumption and standard consumption, thus indicating the usage of material is favourable or adverse.

2. ***Inventory Turnover ratio:*** It is computed as follows:

$$\text{Inventory turnover ratio} = \frac{\text{Cost of materials consumed during the period}}{\text{Cost of average stock held during the period}}$$

$$\text{Average Stock} = \tfrac{1}{2}\,(\text{Opening Stock} + \text{Closing Stock})$$

Computation of turnover ratios for different items of materials and comparison of the turnover ratio provides a useful guidance for measuring inventory performance. Therefore, it is possible to know which is fast moving and which is slow moving. On this basis, attempt should be made to reduce the amount of capital locked up and prevent overstocking of the slow moving items.

12.3.8 Just-in-Time (JIT) System

The Just-in-Time (JIT) system is used to minimize inventory investment. The philosophy is that materials should arrive exactly the time they are needed for production. Ideally the firm should have work-in-process inventory. Because its objective is to minimize inventory investment, a JIT system uses no (or little) safety stock. Close coordination among the firm's employees, its suppliers and transporters must exist to ensure that material inputs arrive on time. Failure of the materials to arrive on time results in a shutdown of the production line until the material arrives. Further, JIT system should ensure quality parts from the suppliers to ensure uninterrupted production.

12.3.9 Material Requirement Planning (MRP) System

Many companies used a Material Requirement Planning (MRP) system to determine what materials to order and when to order. MRP applies EOQ concepts to determine how much to order. By means of a computer, it stimulates each products bill of materials, inventory status and manufacturing process. The bill of materials is simply a list of all the parts and materials that go into making the finished product. For a given production plan, the computer stimulates materials requirements by comparing production needs to available inventory balances. On the basis of the time it takes for a product that is in process to move through the various production stages and the lead time required to get materials, the MRP system determines when orders should be placed for the various item on the bill of materials.

The advantage of an MRP system is that it forces the firm to consider its inventory needs more carefully. The objective is to lower the firm's inventory investment without impairing production.

Self Assessment

Fill in the blanks:

6. …….. indicates the lowest figure of inventory balance which must be maintained in hand at all times.
7. …….. is the ratio of the quantity of input of material to production and the standard material content of the actual output.
8. …….. assumes that the relevant costs of inventory can be divided into order costs and carrying costs.
9. In ABC Analysis …….. category of items consists of only a small percentage of the total items.

Notes



Case Study

Inventory Levels

The Storage Corporation currently carries ₹ 25 million of inventory. The finance manager is considering whether to recommend a reduction in inventory costs at the following information about inventory costs at various levels. The company's after-tax discount rate that is used to evaluate current asset policies is 6%. The company earns a contribution margin of 20% on sales.

	₹ 25 million	₹ 23 million	₹ 21 million
Storage costs	7,50,000	7,25,000	7,10,000
Spoilage costs	4,00,000	3,75,000	3,67,000
Daily sales	1,20,000	1,19,000	1,14,500

(a) Would it be profitable for the company to reduce its inventory from ₹ 25 million to ₹ 23 million? (Calculate the change in after-tax income).

(b) Would it be profitable for the company to reduce its inventory to ₹ 21 million? (Calculate the change in after-tax income.)

(a) Reducing inventory from ₹ 25 to ₹ 23 million causes net income to:

DStorage cost = (₹ 7,50,000 – ₹ 7,25,000)(0.60) = ₹ 15,000

DSpoilage cost = (₹ 4,00,000 – ₹ 3,75,000)(0.60) = 15,000

DFinancing cost = (₹ 20,00,000)(0.06) = 1,20,000

DProfit on sales = (₹ 1,20,000 – 1,19,000)(365)(0.20)(0.60) = (43,800)

DNet Profit = ₹ 1,06,200

(b) To determine if it is profitable to reduce inventory to ₹ 21 million, determine the change in profits associated with reducing from ₹ 23 million. That is, you know that ₹ 23 million is better than ₹ 25 million and the decision is now whether to reduce it further to ₹ 21 million. Remember that decisions depend on incremental costs and benefits.

DFinancing cost = (₹ 20,00,000)(0.06) = 1,20,000

DStorage cost = (₹ 7,25,000 – ₹ 7,10,000)(0.60) = ₹ 9,000

DSpoilage cost = (₹ 3,75,000 – ₹ 3,67,000)(0.60) = 4,800

DFinancing cost = (₹ 20,00,000)(0.06) = 1,20,000

DProfit on sales = (₹ 1,19,000 – 1,14,500)(365)(0.20)(0.60) = (1,97,100)

DNet Profit = (₹ 63,300)

Given the choices, ₹ 23 million is the most profitable level of inventory.

Question

Fabrication Company requires steel for its fabrication work. The probability distributions of the daily usage rate and the lead time for procurement are given below:

Contd...

Notes

These distributions are independent

Daily usage rate in tonnes	Probability	Lead time in days	Probability
4	0.3	5	.6
6	0.5	10	.2
8	0.2	15	.2

The stockout cost is estimated to be ₹ 4,000 per tonne. The carrying cost is ₹ 1,000 per tonne per year.

Required: (a) What is the optimal level of safety stock?

(b) What is the probability of stockout?

Source: Nitin Balwani, Accounting and Finance for Managers, Excel Books, New Delhi.

12.4 Summary

- Inventory is composed of assets that will be sold in the future in the normal course of business operations.
- Inventories provide a 'buffer' between purchasing, producing and marketing goods.
- Four types of inventories may be identified which are Raw material inventory, Stores and spares, Work-in-process inventory and Finished goods inventory.
- The main objective of inventory management is to achieve maximum efficiency in production and sales with the minimum investment in inventory.
- Minimum level indicates the lowest figure of inventory balance which must be maintained in hand at all times, so that there is no stoppage of production.
- In ABC Analysis (called Always Better Control) ABC Analysis (called Always Better Control) the items are divided into three categories according to their importance, value and frequency of replenishment during a period.
- Economic Order Quantity (EOQ) is the order size for some particular inventory item that results in lowest total inventory cost for the period.
- The Just-in-Time (JIT) system philosophy is that materials should arrive exactly the time they are needed for production.
- Many companies used a Material Requirement Planning (MRP) system to determine what materials to order and when to order.
- The methods used for moving the inventory is first in first out (FIFO), last in, first out (LIFO) system.

12.5 Keywords

Economic Order Quantity (EOQ): It refers to that level of inventory at which the total cost of inventory is minimum

Inventory: The stockpile of the products a firm is offering for sales and the components that make up the product.

Notes

Optimum Level of Inventory: It is the level where the total costs of inventory is less.

Raw Materials: It is the input that is converted into finished goods through a manufacturing or conversion process.

Work-in-progress: It is the stage of stocks between raw materials & finished goods.

12.6 Review Questions

1. Why is inventory management important?
2. Describe briefly three types of inventory costs associated with economic order quantity and reorder point compensation.
3. What is meant by a reorder point? What factors affect the inventory reorder point?
4. How does uncertainty affect inventory management?
5. What is meant by the ABC Inventory Control System? On what key promise is this system based? What are its limitations?
6. What are likely to be the new points of each of the following managers about the levels of the various types of inventories: field, marketing, manufacturing, purchasing? What is inventory investment?
7. What factors make managing inventory more vital for companies regarding the issue of effective working capital management?

Answers: Self Assessment

1. optimum size
2. Sale lag
3. safety stock
4. stores and spares
5. minimum
6. Minimum level
7. Input Output ratio
8. EOQ
9. A

12.7 Further Readings



Books

Chandra, P., *Financial Management – Theory and Practice,* New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Dr Pradeep Kumar Sinha, *Financial Management*, New Delhi, Excel Books, 2009.

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Unit 13: Receivables Management

Notes

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Objectives

After studying this unit, you will be able to:

- Identify the cost benefit analysis of receivables;
- Describe the crucial decision areas in receivable management;
- Explain the factoring and credit control;
- Discuss the management of international credit.

Introduction

The term 'receivable' is defined as "debt owed to the firm by customers arising sale of goods or services in the ordinary course of business". When a firm makes an ordinary sale of goods or renders services and does not receive payment it means that the firm has granted trade credit and the amount appears as receivables in the books of the seller, which will be collected in future. Thus, accounts receivable represent an extension of credit to customers, allowing them a reasonable period of time to pay for the goods or services which they have received.

13.1 Costs and Benefits of Receivables

In modern competitive economic systems, sale of goods in credit is an essential part. In fact, credit sales and the receivables are treated as marketing tools to aid the sale of goods.

Notes

13.1.1 Costs

Costs associated are collection cost, capital cost, delinquency cost, and default cost. Costs associated with extension of credit and accounts receivable:

1. ***Collection cost:*** These are administrative costs incurred in collecting the receivables from the customers to whom credit sales are made. Included in the costs are (1) additional expenses in the creation and maintenance of credit department with staff, accounting records, stationery, postage and other related items, (2) expenses in acquiring credit information either through outside specialist agencies or by the staff of the firm itself. These expenses are incurred only if the firm does sell on credit. These costs are likely to be semi-variable since up to a certain point, the existing staff will be able to carry on the increased workload, but beyond that, additional staff will be required. Some costs are variable, e.g., getting credit information from outside agencies in respect of new customers added.
2. ***Capital cost:*** Accounts receivable is an investment in assets, and hence have to be financed thereby involving a cost. The cost on the use of additional capital to support credit sales, which alternatively could be profitably employed elsewhere is therefore a part of the cost of extending credit or otherwise.
3. ***Delinquency cost:*** This arises when the customers fail to meet their obligations on due date after the expiry of the credit period. Such costs are called delinquency costs. The important components of this cost are: (1) blocking of funds for an extended period, (2) cost associated with the steps to be initiated to the over dues, such as reminders and the collection efforts, legal charges, where necessary etc.
4. ***Default cost:*** If the firm is not able to recover the over dues because of the inability of the customers, such debts are treated as bad debts and have to be written off. Such costs are known as default costs associated with credit sales and accounts receivable.



Did u know? With relaxation of credit standards, default expenses (i.e., bad debt expenses) go up. If credit standards are made more restrictive, bad debt expenses go down.

13.1.2 Benefits

Benefits from credit sales and receivables management are increased sales and increased profits. The impact of a liberal policy of trade credit is likely to have two forms. First, it is oriented to sales expansion i.e., to increase sales to existing customers or attract new customers. Secondly, the firm may extend credit to protect its current sales against emerging competition. Here the motive is sales retention. As a result of increased sales, profitability also increases since the firm's fixed costs get distributed on a larger volume i.e., fixed cost per unit to be absorbed gets reduced, increasing the profits of the firm.

13.1.3 Cost/Benefit Analysis

From the above discussion, it is clear that investments in receivables involve both benefits and costs. The extension of trade credit has a major impact on sales, costs and profitability other things being equal, a relatively liberal policy and therefore higher investments in receivable, will produce larger sales. However, costs will be higher with liberal policies than with stringent measures. Therefore, accounts receivable management should aim at trade off between profit (benefit) and risk (cost). That is to say, decision to loosen funds to receivables (or the decision to grant credit) will be based on a comparison of the benefits and costs involved. While determining

Notes

the optimum level of receivables, the costs and benefits to be compared are marginal costs and benefits i.e., the firm should only consider the incremental benefits and costs that result from a change in the receivables or trade policy. Obviously, it can go on extending credit facility till the incremental benefits are more than the incremental costs.



Notes Credit sales are generally made on open account that means, there is no formal acknowledgement of debt obligation through any financial instrument. However, extension of credit involves risk and cost. The benefits as well as cost to determine the goal of receivable management.

Self Assessment

Fill in the blanks:

1. ……. cost arises when the customers fail to meet their obligations on due date after the expiry of the credit period.
2. ……. are administrative costs incurred in collecting the receivables from the customers to whom credit sales are made.
3. Costs will be higher with liberal policies than with ……. measures.
4. While determining the optimum level of receivables, the costs and benefits to be compared are ……. costs and benefits.

13.2 Three Crucial Decision Areas in Receivables Management

The three crucial decision areas in receivable management are (a) credit policies (b) credit terms and (c) collection policies.

13.2.1 Credit Policies

It involves a trade-off between profits on additional sales that arise due to credit being extended on the one hand and cost of carrying the receivables and bad debt losses on the other. The credit policy of a firm provides the framework to determine (1) whether or not to extend credit to a customer and (2) how much credit to extend. The credit policy decision has two dimensions (1) credit standards and (2) credit analysis.

Credit standards: The term 'credit standards' represents the basic criteria for the extension of credit to customers. The quantitative bases of establishing credit standards are factors such as credit ratings, credit references, average payment period, and certain financial ratio. We are interested in illustrating the trade-off between benefit and cost to the firm as a whole and therefore not considering the individual components of credit standards. The trade-off with reference to credit standards covers the collection cost, the average collection period, level of bad debt losses, and level of sales. These factors should be considered while considering whether to relax credit standards or not.

The implication of relaxed credit standards is more credit, a larger credit department to service accounts and related matters and increase in collection costs.

A relaxation in credit standard implies an increase in sales, which in turn, leads to higher average accounts receivables. Further, relaxed standards would enable credit to get extended to

Notes

even less creditworthy customers, resulting in longer period to pay over dues. The reverse will happen if credit standards are tightened.

Further, changing credit standards can also be expected to change the volume of sales. As standards are relaxed, sales are expected to increase; conversely a tightening is expected to cause a decline in sales.



Caution It must be kept in mind that with relaxation in credit standards, bad expenses will go up.

The effect of alternative credit standards is illustrated in the following example:



Example: A firm is currently selling a product at ₹ 10 per unit. The most recent sales (all credit) were 60,000 units. The variable cost per unit is ₹ 6 and the average cost per unit given a sales volume of 60,000 units is ₹ 8. The firm's total fixed cost is ₹ 120,000. The average collection period may be assumed to be 30 days.

The firm is contemplating a relaxation of credit standards that is expected to result in a 15 per cent increase in rupee sales. The average collection would increase to 45 days with no change in bad debt expenses. The increase in collection expenses may be assessed to be negligible. The firms required return on investment is 15 per cent.

Should the firm relax the credit standard?

Solution:

Current Plan:		
Sales Revenue	60,000 × ₹ 10/-	600,000
Less Cost:		
Variable 60,000 × 6	360,000	
Fixed	120,000	480,000
Profit on Sales		120,000
Less: Interest @ 15% on average receivables		
1 month credit period hence avg. receivables		
Cost of sales $\left(\frac{8\times 60,000+6\times 9000}{360}\right)$ = 40,000 × 0.15		6,000
Net Profit		114,000
Proposed Plan		
Sales Revenue	60000 × 1.15 × ₹ 10	690,000
Less cost:		
Variable 60,000 × 6 × 1.15	414,000	
Fixed	120,000	534,000
Profit on sales		156,000
Less Interest @ 15% on average receivables		10,013
i.e., $15\%\times\frac{534000\times 1.5}{12}$		
Net Profit		**145,987**
Hence, increase in profits of the firm and the firm should relax the credit standard		31,987

Notes

13.2.2 Credit Analysis

Besides establishing credit standards, a firm should develop procedures for evaluating credit applicants. Two basic steps are involved in the credit investigation process – obtaining credit information and analysis of credit information.



Did u know? On the basis of credit analysis the decision to grant credit to a customer as well as the quantum of credit is taken.

Sources of credit information are internal and external. Internal means various forms filled in by the customers giving details of financial operation, trade references of firms with whom the customer has business, behaviour of the customer in terms of historical payment pattern in respect of existing credit customer. External sources include copy of the published financial statements, trade references and bank references. Finally, specialist credit bureau reports from organizations specializing in supplying credit information can also be utilized.

Once the credit information has been collected from different sources, the next step is to determine credit worthiness of the applicant. There are no established procedures to analyze the information. The analysis should cover two aspects – quantitative and qualitative.

The assessment of the quantitative aspect is based on factual information available from the financial statements, the past records of the firm and so on. Another step may be through a ratio analysis of the liquidity, profitability and financial capacity of the applicant and comparison with the industry average. Again trend analysis over a period of time will reveal the financial strength of the customer. Another approach may be to prepare an ageing schedule of the accounts payable of the applicant. This will give an insight into the past payment pattern of the customer.

The quantitative assessment should be supplemented by qualitative interpretation of the applicants credit worthiness. For example, quality of management, references from other suppliers, bank references and specialist bureau reports.

13.2.3 Credit Terms

Credit terms have three components:

1. Credit period in terms of time for which credit is extended, during this period the overdue amount must be paid by the customer;
2. Cash discount, if any, which the customer can take advantage of i.e., overdue amount will be reduced by this amount; and
3. Cash discount period, which refers to the duration during which the discount can be availed of.

These terms are usually written as 2/10 net 30. The abbreviation 2/10 net 30 means that the customer is entitled to 2% cash discount if he pays within 10 days (discount period) after the beginning of the credit period of 30 days. If, however, he does not want to take advantage of the discount he may pay within 30 days. If not made within a maximum period of 30 days, the customer would be deemed to have defaulted.

The credit terms such as the credit standards, affect the profitability as well as the cost of this firm. The three components of credit terms, namely, the rate of discount, period of discount and the credit period affect the trade-off. Here the analysis is restricted from the point of suppliers of trade credit.

Notes

The cash discount has implications for the sales volume, average collection period, bad debt expenses and profit per unit. The sales volume will increase. The grant of discount implies reduced prices. If the demand for the products is elastic, reduction in prices will result in higher sales volume.



Caution A firm should determine the credit terms on the basis of cost benefit trade-off.

Since the customers would like to take advantage of the discount and pay within the discount period, the average collection period would be reduced. The reduction in the collection period would lead to a reduction in the investment in receivables and also the cost. The decrease in the average collection period would also cause a fall in bad debt expenses. As a result, profits will increase. The discount would have a negative effect in the profits. This is because the decrease in prices would affect the profit margin per unit of sale. Increase in credit period will increase the sales volume, average collection period and bad debt expenses. A reduction in credit period is likely to have an opposite effect.



Example: In our example, assume that the firm is contemplating to allow 2% discount for payment prior to the 10th day after a credit sale. It would be recalled that the current average collection period is 30 days, credit sales are 60,000 units. The variable cost per unit is ₹ 6 as the average cost per unit is ₹ 8.

It is expected that if discounts are offered, sales will increase by 15% i.e., to 69000 units and the average collection period will drop to 15 days. Assume, bad debt expenses will not be affected, return on investment expected by the firm is 15%, 60% of the total sales will be on discount. Should the firm implement the proposal?

Solution:

Benefit:		
Profit on sales	= Additional units × (sales price – variable cost)	
	= 9000 × (10 – 6)	₹ 36,000
Saving on avg. collection period		
Present: Average investment in receivable at cost		
$\frac{60,000 \times 8}{12}$		₹ 40,000
Proposed: Average investment in receivables		
$\frac{(60,000 \times 8) + (9000 \times 6)}{24}$		₹ 22,250
	Reduction	₹ 17,750
	Int. @ 15% on saving 17750 × 0.15	₹ 2,663
		₹ 38,663
Cost,		
	2% on 60% of 69000 × ₹ 10	₹ 8,280
	Net benefit	₹ 30,383

Notes

Example: Suppose the firm is contemplating an increase in the credit period from 30-60 days. The average collection period, which is at 45 days, is expected to increase to 75 days. It is also likely that the bad debt or expenses will increase from the current level of 1% to 3% of sales. Total credit sales are expected to increase from the current levels of 60,000 units to 69,000 units. The present average cost per unit is ₹ 8; the variable cost sales per unit are ₹ 6 and ₹ 10 per unit respectively. Assume the firm expects a return of 15%. Should the firm extend the credit period?

Solution: The decision should be taken on the basis of comparison of benefits and costs associated with the decision. The benefits arising from additional profits from additional sales, while the costs include the cost of additional investments in receivables and additional bad debt expenses:

1. Profit on additional sales ₹ 4 × 9000 = ₹ 36,000

2. Cost of additional investment in receivables

$$\text{Proposed investment} = \left(\frac{8 \times 60{,}000 + 6 \times 9000}{360}\right) \times 75 = 111{,}250$$

$$\text{Present investment} = \frac{\text{Accounts Receivable at time chosen}}{\text{Average daily sales}} \times 45$$

	60,000
Additional investment proposed	51,250
Cost of additional investment at 15%	7,688

3. Additional bad debt expense

Bad debt with proposed credit period 3% on ₹ 690,000	20,700
Bad debts with present plan 1% × ₹ 600,000	6000
Hence additional bad debt expenses	14,700

Thus, the total cost associated with the extension of credit period is ₹ 7688 + 14700 i.e., ₹ 22,388. As against this, the benefit comes to ₹ 36,000. There is therefore a net gain of ₹ 13,612. The firm must be advised to extend the credit period from 30 to 60 days.

Example: XYZ Corporation is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. Currently the firm has annual credit sales of ₹ 50 lakhs and accounts receivable turnover ratio of 4 times a year. The current level of loss due to bad debts is ₹ 1,50,000. The firm is required to give a return of 25% on the investment in new accounts receivable. The company's variable costs are 70% of the selling price. Given the following further information, which is a better option?

	Present Policy	Policy Option I	Policy Option II
Annual credit sales	₹ 50,00,000	₹ 0,00,000	₹ 67,50,000
Accounts receivable turnover ratio	4 times	3 times	2.4 times
Bad debt losses	₹ 1,50,000	₹ 300,000	₹ 4,50,000

Notes

Solution: XYZ Corporation

Decision-making (liberalization of credit terms)

	Present Policy(₹)	Policy Option 1 (₹)	Policy Option II (₹)
Sales revenue	₹ 50,00,000	₹ 60,00,000	₹ 67,50,000
Less variable cost	35,00,000	42,00,000	47,25,000
contribution	15,00,000	18,00,000	20,25,000
Less other relevant costs			
Bad debt losses	1,50,000	300,000	4,50,000
Investment cost (Notes)	218,750	3,50,000	4,92,187.50
Contribution margin-final	11,31,250	11,50,000	10,82,812.50



Notes

Present policy: 35,00,000/4times = ₹ 875,000. Its cost @ 25% = ₹ 218,750

Option 1 : 42,00,000/3times = ₹ 14,00,000. Its cost @ 25% = ₹ 3,50,000

Option 2 : 47,25, 000/2.4times = ₹ 19,68,750. Its cost @ 25% = ₹ 4,92,187.50

Collection Policies

Efficient and timely collection of debtors ensure that bad debt losses are reduced to the minimum and the average collection period is shorter. If the firm spends more resources, on utilization of debts, it is likely to have smaller bad debts. Thus, a firm must work out the optimum amount that it should spend on collection of debtors. This involves a trade-off between the levels of expenditure on the one hand and decreases in bad debt losses and appropriate investment in debtors on the other.

The collection cost of the firm has to work in a manner that it does not create too much resentment amongst the customers. On the other hand, it has to keep the amount of outstanding payments in check. Hence, it has to work in a very smooth manner and diplomatically too.

It is important that clear-cut procedures regarding credit collection are set up. Such procedures must answer questions like the following:

1. How long a is debtor balance allowed to exist before collection process is started?
2. What should be the procedure of follow up with defaulting customer? How are reminders are to be sent and how should each successive reminder be drafted?
3. Should there be collection machinery whereby personal calls by company's representatives are made?
4. What should be the procedure for dealing with doubtful accounts? Is legal action to be initiated? How should account be handled?

Monitoring of Receivables

1. ***Computation of average age of receivables:*** It involves computation of average collection period as follows: $\frac{\text{Accounts Receivable at time chosen}}{\text{Average daily sales}}$

Notes

2. ***Ageing schedule:*** An important insight into the collection pattern of the preparation of their ageing schedule. In this, receivables are classified according to their age, say 1-30 days, 31-60 days, 61-90 days, 91-120 days and 121 days and above. This classification helps the firm in its collection efforts and enables the management to have a closer control over the quality of individual accounts. The agency schedule provides an effective method of comparing the liquidity of receivables with the liquidity of receivables in the past as well as that of another firm in the same industry. This comparison can be made periodically. The ageing schedule provides a useful supplement to average collection period receivables/ sales analysis.

3. ***Collection programme:***

   (a) Monitoring the state of receivables

   (b) Intimating to customers when due date approaches

   (c) Telegraphic and telephone advice to customers on the due dates

   (d) Threat of legal action on overdue accounts

   (e) Legal action on overdue accounts.

4. ***Collection matrix:*** In order to correctly study the changes in the payment behaviour of customer, it is helpful to look at the pattern of collections associated with credit sales. The following table shows an illustrative collection matrix.

Example: the credit sales during the month of January are collected as follows:

10% in January (the month of sales), 42% in February (the first following month), 36% in March (the second following month) and 12% in April (the third following month).

From the collection pattern, one can judge whether the collection is improving, stable or deteriorating. A secondary benefit of such an analysis is that it provides a historical record of collection percentage. That could be useful in projecting monthly receipts for each budgeting period.

Collection Matrix

Percentage of receivables colleted during the	Jan Sales	Feb Sales	March Sales	April Sales	May Sales
Month of sales	10	14	13	15	9
First following month	42	35	38	40	35
Second following month	36	40	26	21	26
Third following month	12	11	23	19	25
Fourth following month				5	5

Task ABC Company's existing sales are ₹ 180 lakhs. It is currently extending a credit period of 'net 30 days' to its customers. The company's contribution to sales ratio is 20 per cent and the cost of funds is 15 per cent. The company is contemplating to increase its sales by ₹ 16 lakhs to be achieved by means of lengthening the existing period to 'net 45 days'. The bad debt loses on additional sales is expected to be 5 per cent. Should the company go in for a policy change or not?

Notes

Self Assessment

Fill in the blanks:

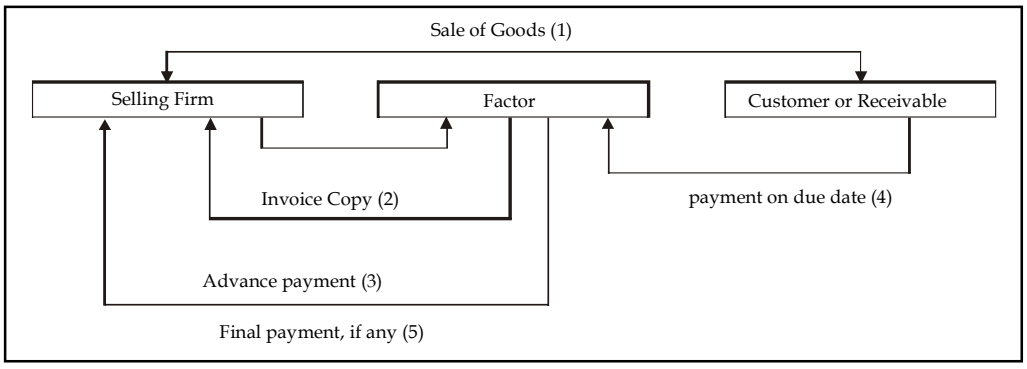
5. The …… represents the basic criteria for the extension of credit to customers.
6. Efficient and timely collection of debtors ensures that …… losses are reduced to the minimum and the average collection period is shorter.
7. Credit terms have three components which are……; Cash discount and Cash discount period.
8. If the demand for the products is elastic, reduction in prices will result in …… sales volume.

13.3 Factoring and Credit Control

A large firm has some advantages, in managing its accounts receivable. First, it may be possible for divisions to pool information on the creditworthiness of its customers. Second, there are potential companies of scale in record keeping, billing etc., especially if the process can be computerized. Third, debt collection is a specialized business that calls for experience and judgement. The small firm may not be able to hire or train a specialized credit manager. However, it may be able to obtain some of the economies by parking part of the job out to a factor and the arrangement is known as factoring.

Factoring is a collection and finance service designed to improve the cash flow position of the sellers by converting sales invoices into ready cash. It is a continuing arrangement between the factor and the seller client, the factor purchases the client's debtors and in relation thereto controls the credit extended to the customers and administer the sales ledger.

1. Under an agreement between the seller and selling firm, the latter makes an appraisal of the creditworthiness of the potential customers and may also set the credit limit and terms of credit for different customers.
2. The sales documents will contain the instructions to make the payment directly to the factory that is responsible for the collection.
3. When the payment is received by the factor on the date, the factor shall deduct its fees, charges etc., (as agreed) and credit the balance to the firm's accounts.
4. In some cases, if agreed, the factor firm may also provide advance finance to the selling firm for which it may charge from the selling firm. In a way, this tantamount to bill discounting by the factor firm. However, factoring is something more than mere bill discounting, as the former includes analysis of the credit worthiness of the customer too. The factor may pay whole or a substantial portion of the sales value to the selling firm immediately on sales being affected. The balance, if any, may be paid on the normal due date. The mechanism of factoring has been presented in following figure:



Notes

In addition to purchasing of receivables, the factor firm may provide the following additional services:

1. Raising funds on the security of the receivables
2. Receivables collection management, and,
3. Protection against defaults by the receivables.
4. It may be noted that a firm need not avail all these services from the factor and the agreement between the selling firm and the factor firm may be tailor made to suit the specific needs of the selling firm. In a nutshell, the functions of a factor may be described as credit investigation, credit administration; credit monitoring, credit collection, credit protection and credit financing.

Benefits and Costs of Factoring

The factoring is nothing but a substitute for in-house management of receivables. Factoring offers a very flexible mode of cash generation against the receivables. Once a line of credit is established, factoring helps availability of cash at an earliest opportunity after sales. Factoring tends to increase the number of rotations by converting credit sales into cash. A firm availing factoring services may have the following benefits:

1. ***Better cash flows:*** The seller can offer credit to the customers, within the terms approved by the factor and can receive prompt payments shortly after invoicing. This may be cheaper than financing and therefore, can be availed if the firm expects a liquidity problem on a regular basis. In fact, the factoring ensures a definite pattern of cash inflows from the credit sales.
2. ***Better assets management:*** The security for such financial assistance is the receivable itself and therefore, the other assets will remain available as security for other borrowings.
3. ***Better working capital management:*** Since, finance available from factoring moves directly with the level of the receivables, the necessity of additional working capital to match the sales growth does not arise.
4. ***Better administration:*** The debt management services which factors provide relieve the seller of the burden of administration and saves on the cost of staff and office space. In other words, it enables the seller to concentrate on developing his business.
5. ***Better evaluation:*** The debt management service may include formal or informal advice on credit standing. Factors hold large amounts of information about the trading histories of firms. This can be valuable to those who are using factoring services and can thereby avoid doing business with customers having poor track record.
6. ***Better risk management:*** In case of non-recourse factoring, the seller will have the advantage of repositioning the risk of customers not paying their due bills. This will cost more than recourse factoring and thereby allows the seller to escape the consequences of customer's default.

   However, the factoring involves some monetary and non-monetary costs as follows:

   Monetary costs:

   (a) The factor firm usually charges substantial fees and commission for the collection of receivables.

   (b) The advance finance provided by the factor firm would be available at a higher interest costs than the usual rate of interest.

Notes

Non-monetary costs:

(a) The factor firm doing the evaluation of the creditworthiness of the customer will be primarily concerned with the minimization of risk of delays and defaults. In the process, it may tend to ignore possible sale prospect.

(b) A factor is a third party to the customer and the latter not feel comfortable while dealing with it.

(c) The factoring of receivables may be considered as a symptom of financial weakness. Thus, while evaluation the use of factoring services, the firm must analyze the costs and benefits associated with the factoring. It may be noted that though factoring is a costly service, yet some firms may find it to be more economical than to establish their own collection department.

Self Assessment

Fill in the blanks:

9. Factoring is a collection and finance service designed to improve the cash flow position of the sellers by converting …… into ready cash.

10. The …… is a substitute for in-house management of receivables.

11. The advance finance provided by the factor firm would be available at a …… interest costs than the usual rate of interest.

12. The factoring of receivables may be considered as a symptom of financial …… .

13.4 Managing International Credit

Credit management is difficult task for managers of purely domestic companies, and these tasks, become much more complex for companies that operate internationally. This is partly because international operations typically expose a firm to exchange rate risk. It is also due to the perils involved in shipping goods to long distance and to cross at least two international boundaries.

Exports of finished goods are usually priced in the currency of the importers' local market. Therefore, a US company that sells a product in Japan, would have to price that product in Japanese yen and extend credit to Japanese wholesale in local currency (yen). If yen depreciates against the dollar before the US exporter collects its account receivable, the US company experience an exchange rate loss, the yen collected are worth fewer dollars than expected at the time when the sale was made. The exchange rate variation can happen the other way yielding an exchange rate gain to the US exporter.

For a major currency such as the Japanese Yen, the exporter can bridge against this risk by using currency, forward or option markets, but it is costly to do, particularly for relatively small amounts.

This risk may be further magnified because credit standards may be different and acceptable collection techniques much different.



Notes The exporter cannot take the "not to bother" approach and concede foreign markets to international rivals. Those export sales, if carefully monitored and (where possible) effectively hedged against exchange rate risk, often prove to be very profitable.

Self Assessment

Notes

Fill in the blanks:

13. International operations typically expose a firm to …… risk.
14. For a major currency, the exporter can bridge against the risk by using currency, forward or …… markets.
15. This risk in international credit may be further magnified because credit standards may be different and …… techniques much different.



Case Study

Agarwal Cast Company

On August 30, 2006, Agarwal Cast Company Inc., applied for a $200,000 loan from the main office of the National bank of New York. The application was forwarded to the bank's commercial loan department.

Gupta, the President and Principal Stockholder of Agarwal cast, applied for the loan in person. He told the loan officer that he had been in business since February 1976, but that he had considerable prior experience in flooring and carpets since he had worked as an individual contractor for the past 20 year. Most of this time, he had worked in Frankfurt and Michigan. He finally decided to "work for himself" and he formed the company with Berry Hook, a former co-worker. This information seemed to be consistent with the Dun and Bradstreet report obtained by the bank.

According to Gupta, the purpose of the loan was to assist him in carrying his receivables until they could be collected. He explained that the flooring business required him to spend considerable cash to purchase materials but his customers would not pay until the job was done. Since he was relatively new in the business, he did not feel that he could compete if he had to require a sizeable deposit or payment in advance. Instead, he could quote for higher profits, if he were willing to wait until completion of the job for payment. To show that his operation was sound, he included a list of customers and projects with his loan application. He also included a list of current receivables.

Gupta told the loan officer that he had monitored his firm's financial status closely and that he had financial reports prepared every six months. He said that the would send a copy to the bank. In addition, he was willing to file a personal financial statement with the bank.

Question

Prepare your recommendation on Agarwal Cast Company.

13.5 Summary

- Receivable is defined as debt owed to the firm by customers arising sale of goods or services in the ordinary course of business.
- The three crucial decision areas in receivable management are (a) credit policies (b) credit terms and (c) collection policies. Credit Policies involves a trade-off between profits on additional sales that arise due to credit being extended on the one hand and cost of carrying the receivables and bad debt losses on the other.

Notes

- Credit terms have three components which are Credit period, Cash discount and Cash discount period.
- The collection cost of the firm has to work in a manner that it does not create too much resentment amongst the customer.
- Factoring is a collection and finance service designed to improve the cash flow position of the sellers by converting sales invoices into ready cash.
- Factoring offers a very flexible mode of cash generation against the receivables.
- Credit management is difficult task for managers that operate internationally because international operations typically expose a firm to exchange rate risk.

13.6 Keywords

Collection Policy: It is the procedures passed to collect amount receivables, when they become due.

Credit Standards: It refers to the minimum criteria for the extension of credit to a customer.

Credit Terms: It means the stipulations under which goods or services are sold on credit.

Receivables: It is defined as debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business.

Receivables Management: It involves decision areas: credit standards, credit period, cash discounts and collection procedures.

13.7 Review Questions

1. Explain the objectives of credit polity of/or firm. What are the elements of a credit policy?
2. What are the techniques of control of receivables? Explain the "Ageing Schedule".
3. Who do you mean by factoring? Explain the benefits of factoring.
4. Why are a firm's regular credit terms typically conform to those of its industry?
5. What are the basic trade-offs in a tightening of credit standards?
6. Why are the risks involved in international credit management more complex than those associated are true or false with purely domestic credit sales?
7. Analyse the benefit of the receivables management to the corporates.
8. Elucidate the consequences of liberal versus stiff credit standards.
9. Examine the different sources of credit information to the corporates and to the agencies.
10. Examine the factors that influence the size of investment in receivables.

Answers: Self Assessment

1.	Delinquency	2.	Collection cost
3.	stringent	4.	marginal
5.	credit standards	6.	bad debt
7.	Credit period	8.	higher

9. sales invoices
10. factoring
11. higher
12. weakness.
13. exchange rate
14. option
15. acceptable collection

Notes

13.8 Further Readings



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Unit 14: Capital Market and Financial Institutions

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14.9 Summary

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14.11 Review Questions

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Objectives

After studying this unit, you will be able to:

- Describe the capital and money market;
- Explain the role of primary and secondary market;
- Identify the different types of financial institutions;
- Discuss about various banking and non-banking financial companies in India;
- Describe the role of various financial regulators in India.

Introduction

Financial sector plays an indispensable role in the overall development of a country. Financial Market is the interface between a large number of buyers and sellers of the financial products. The prices of the products are fixed by the market forces of demand and supply within the market itself.

The financial market promotes the savings of the economy, providing an effective channel for transmitting the financial policies. Technically speaking, a financial market facilitates:

- The raising of capital (in the capital markets);
- The transfer of risk (in the derivatives markets);
- International trade (in the currency markets)

The most important constituent of financial sector is the financial institutions, which act as a conduit for the transfer of resources from net savers to net borrowers, that is, from those who spend less than their earnings to those who spend more than their earnings.

In this unit you will study about the structure, role and importance of capital market and financial institutions in India.

14.1 Financial Market in India

A Financial Market can be defined as the market in which financial assets are created or transferred. As against a real transaction that involves exchange of money for real goods or services, a financial transaction involves creation or transfer of a financial asset. Financial Assets or Financial Instruments represent a claim to the payment of a sum of money sometime in the future and/or periodic payment in the form of interest or dividend.

Money Market: The money market is a wholesale debt market for low-risk, highly-liquid, short-term instrument. Funds are available in this market for periods ranging from a single day up to a year. This market is dominated mostly by government, banks and financial institutions.

Capital Market: The capital market is designed to finance the long-term investments. The transactions taking place in this market will be for periods over a year.

Forex Market: The Forex market deals with the multi-currency requirements, which are met by the exchange of currencies. Depending on the exchange rate that is applicable, the transfer of funds takes place in this market. This is one of the most developed and integrated market across the globe.

Credit Market: Credit market is a place where banks, FIs and NBFCs Purvey short, medium and long-term loans to corporate and individuals.

Notes

14.1.1 Capital Market

The capital market is the market for securities, where companies and governments can raise long-term funds. It is a market in which money is lent for periods longer than a year.

The different types of financial instruments that are traded in the capital markets are equity instruments, credit market instruments, insurance instruments, foreign exchange instruments, hybrid instruments and derivative instruments.

Capital Market consists of primary market and secondary market. In primary market newly issued bonds and stocks are exchanged and in secondary market buying and selling of already existing bonds and stocks take place.

1. ***Primary Capital Market:*** The primary capital markets is also called the New Issue Market or NIM. The securities which are introduced in the market are sold for first time to the general public in this market. This market is also known as the long term debt market as the fund raised from this market provides long term capital.
2. ***Secondary Capital Market:*** The secondary capital market deals with those securities that are already issued in an initial public offering in the primary market. Typically, the secondary markets are those where previously issued securities are purchased and sold.

14.1.2 Money Market

Money market provides a mechanism by which short-term funds are lent out and borrowed. It is place where a bid is made for short-term investible funds at the disposal of financial and other institutions by borrowers comprising institutions, individuals and the Government itself. Thus, money market covers money, and financial assets which are close substitutes for money. The money market is generally expected to perform following three broad functions:

- To provide an mechanism to fulfill the demand and supply of short term funds
- To provide a tool to manage the liquidity and interest rate in the economy
- To provide reasonable access to providers and users of short-term funds to fulfill their borrowing and investment requirements at an efficient market clearing price

Money market can be of two types namely organized money market and unorganized money market.

1. ***Organized money market***: It comprises of commercial banks, financial institutions and all short term asset trading institutions.
2. ***Unorganized Money Market***: Along with the organized money market, there exists a very strong unorganized money market, especially in countries that are developing but are still to be developed. In such countries, people and small companies prefer taking loans from relatives, usurers, sahukars, etc, instead of going and applying to organized institutions registered under the monetary authorities.



Task Select the correct answer from the given alternatives:

1. The component of money market is:
   (a) Government securities market
   (b) Bill market
   (c) Primary market

Contd...

Notes

2. The capital market instruments among the following is:
   (a) Share certificate
   (b) Secured premium notes
   (c) Inter-bank call money
3. The major player in the Indian money market is:
   (a) Indigenous banks
   (b) Reserve Bank of India
   (c) State Bank of India

14.2 Primary Market

The primary market is that part of the capital markets that deals with the issuance of new securities. Companies, governments or public sector institutions can obtain funding through the sale of a new stock or bond issue. This is typically done through a syndicate of securities dealers. The process of selling new issues to investors is called underwriting In the case of a new stock issue; this sale is an Initial Public Offering (IPO). Dealers earn a commission that is built into the price of the security offering, though it can be found in the prospectus.

Features of primary markets are:

1. This is the market for new long term capital. The primary market is the market where the securities are sold for the first time. Therefore it is also called the new issue market (NIM).
2. In a primary issue, the securities are issued by the company directly to investors.
3. The company receives the money and issues new security certificates to the investors.
4. Primary issues are used by companies for the purpose of setting up new business or for expanding or modernizing the existing business.
5. The primary market performs the crucial function of facilitating capital formation in the economy.
6. The new issue market does not include certain other sources of new long term external finance, such as loans from financial institutions. Borrowers in the new issue market may be raising capital for converting private capital into public capital; this is known as "going public."
7. The financial assists sold can only be redeemed by the original holder.

14.2.1 Methods of issuing Securities in the Primary Market

The different methods of share issues are discussed below:

Public Issue through Prospectus

A common method followed by corporate enterprises to raise capital through the issuing of prospectus to public. Under this method, the issuing company directly made the offer to public. The offer can be on face value for new issuing companies and can be on premium for the existing companies. The contents of the prospectus should include the following: (i) Name and registered office of the issuing company (ii) Existing and proposed activities (iii) Board of directors (iv) Location of the industry (v) Authorized, subscribed and proposed issue of capital to public (vi) Dates if opening and closing of subscription list (vii) Name of broker, underwriters, and

Notes

others, from whom application forms along with copies of prospectus can be obtained (viii) Minimum subscription (ix) Names of underwriters, if any, along with a statement that in the opinion of the directors, the resources of the underwriters are sufficient to meet the underwriting obligations and (x) A Statement that the company will make an application to stock exchange(s) for the permission to deal in or for a quotation of its shares and so on.

Book Building

Book Building is the process used by companies raising capital through Public Offerings-both Initial Public Offers (IPOs) or Follow-on Public Offers (FPOs) to aid price and demand discovery. It is a mechanism where, during the period for which the book for the offer is open, the bids are collected from investors at various prices. The bid price should be within the band specified by the issuer. The process is directed towards both the institutional as well as the retail investors.



Notes The issue price is determined after the bid closure based on the demand generated in the process.

Offer for Sale

Another method by which securities can be issued is by means of an offer for sale. Under this method, instead of the issuing company itself offering its shares directly to the public, it offers through the intermediary of issue houses/merchant banks/investment banks or firms of stockbrokers. The sale of securities with an offer for sale method is done in two stages. In the first stage, the issuing company sells the securities to the issuing houses or stock brokers at an agreed fixed price and in the second stage the issue house or stock brokers sell the securities to the unlimited investors. The securities are offered to the public at a price higher than the price at which they were acquired from the company.

Private Placement

Under this method, securities are acquired by the issue houses, as in offer for sale method, but instead of being subsequently offered to the public, the securities are issued to institutional investors. Each issue house has a list of large private and institutional investors who are always prepared to buy their securities.

Rights Issue

The methods discussed above can be used both by new companies as well as by established companies. In the case of companies whose shares are already listed and widely-held, shares can be offered to the existing shareholders. This is called rights issue. Under this method, the existing shareholders are offered the right to subscribe to new shares in proportion to the number of shares they already hold.



Did u know? This offer is made by circular to 'existing shareholders' only.

14.2.2 Role of Primary Market

The main role of the New Issue Market is to facilitate the 'transfer of resources' from the savers to users. Conceptually, however, the New Issue Market should not be conceived as a platform

Notes

only for the purpose of raising finance for new capital expenditure. In fact, the facilities of the market are also utilized for selling exiting concerns to the public as going concerns through conversions of exiting proprietary enterprises or private companies into public companies. The main function of the New Issue Market, i.e. channelling of investible funds, can be divided, from the operational stand- point, into a triple service function:

1. Origination
2. Underwriting
3. Distribution

The institutional setup dealing with these can be said to constitute the New Issue Market organization. Let us elucidate a little on all of these.

1. ***Origination:*** Origination refers to the work of investigation and analysis and processing of new proposals. This in turn may be:

   (i) A preliminary investigation undertaken by the sponsors (specialized agencies) of the issue. This involves a careful study of the technical, economic, financial and legal aspects of the issuing companies to ensure that it warrants the backing of the issue house.

   (ii) Services of an advisory nature which go to improve the quality of capital issues. These services include advice on such aspects of capital issues as:

      (a) Determination of the class of security to be issued and price of the issue in terms of market conditions;

      (b) The timing and magnitude of issues;

      (c) Method of flotation; and

      (d) Technique of selling and so on.

2. ***Underwriting:*** The idea of underwriting originated on account of uncertainties prevailing in the capital market as a result of which the success of the issue becomes unpredictable. If the issue remains undersubscribed, the directors cannot proceed to allot the shares, and have to return money to the applicants if the subscription is bellow a minimum amount fixed under the Companies Act. Consequently, the issue and hence the project will fail.

   Underwriting entails an agreement whereby a person/organization agrees to take a specified number of shares number of shares or debentures or a specified amount of stock offered to the public in the event of the public not subscribing by the public, there is no liability attaching to the underwriters; else they have to come forth to meet the shortfall to the extent of the under subscription.

   The underwriters in India may broadly be classified into the following two types:

   (i) Institutional Underwriters;

   (ii) Non-institutional Underwriting

3. ***Distribution:*** The sale of securities to the ultimate investors is referred to as distribution; it is another specified job, which can be performed by brokers and dealers in securities who maintain regular and direct contact with the ultimate investors.



Notes The ability of the New Issue Market to cope with the growing requirements of the expanding corporate sector would depend on this triple service function.

Notes

Self Assessment

Fill in the blanks:

1. The main role of the …… is to facilitate the 'transfer of resources' from the savers to users.
2. The sale of securities to the ultimate investors is referred to as …… .
3. The sale of securities with an offer for sale method is done in …… stages.
4. The underwriters in India may broadly be classified into the following …… types.
5. …… is the process used by companies raising capital through Public Offerings-both Initial Public Offers (IPOs) or Follow-on Public Offers (FPOs).
6. …… refers to the work of investigation and analysis and processing of new proposals.
7. The primary market is that part of the …… markets that deals with the issuance of new securities.

14.3 Secondary Market

Secondary market essentially comprises of stock exchanges which provide platform for purchase and sale of securities by investors. In India, apart from the regional stock exchanges established in different centers, there are exchanges like the national stock exchange and over the counter exchange of India who provide nation wide reading facilities with terminals all over the country. The trading platform of stock exchanges is accessible only through brokers and trading of securities is confined only to stock exchanges.

Thus, the securities market has two independent, inseparable segments, the new issues market and the stock market. The primary market provides channel for sale of new securities while the secondary market deals in securities previously issued. The issuer of securities sells the securities to the primary market to raise funds for investment or to discharge some obligations. The secondary market enables them who hold securities to adjust their assessment of risk and return. They also sell securities for cash to meet their liquidity needs.

14.3.1 Trading System in Stock Market

Trading on stock exchanges is done through brokers and dealers. All members can act as brokers and for this purpose they have to maintain security deposits. Brokers act as agents, buying and selling or others for which they receive brokerage commission at stipulated rates. Dealers act as principals and sell securities on their own accounts.

However, members cannot enter into contract with any person other than a member without prior permission the governing body. Given below are the key members of the stock exchanges:

1. ***Commission Broker:*** The commission broker executes buying and selling on the floor of the stock exchange.
2. ***Floor Broker:*** Floor brokers are not many. They execute orders for fellow members and receives a share brokerage commission charged by a commission broker to his/her constituent.
3. ***Tataniwala:*** He/she is a jobber or specialist in selected shares he/she 'makes the market' i.e. brings continuity to dealings. They specialize in stocks which are traded inactively.

Notes

4. ***Dealer in non-cleared securities:*** He/she deals in securities which are not on the active list.

5. ***Odd-lot Dealer:*** He/she specializes in buying and selling in amounts which are less than present trading units. They buy and sell odd lots, make them up into marketable trading units. These dealers receive commission. Their earnings come from the difference between the process at which they buy and sell. The odd-lot dealer has become an important operator since the growth of new issues. When the number of applicants for a new issue is large, shares may be allotted in lots which are smaller than prescribed lots. The odd-lot dealer makes profit on the large numbers of odd-lots by buying and selling at different prices.

6. ***Budiwalas:*** He/she specializes in buying and selling simultaneously in different markets. The difference between the buying price in another market constitutes his profit. However, he can transact such business only if a security is traded on more than one stock exchange and if exchanged telephonically or ax-linked. In India, arbitraging has become a growing business. Arbitraging requires prior application to the governing body "in order to avoid " the evil of "joint account" with members of other stock exchanges and consequent involvement of one exchange in the difficulties of another.

7. ***Security Dealer:*** This dealer specializes in trading in government securities. He/she mainly acts as a jobber and takes the risks inherent in ready purchase and sale of securities. The government securities are over the counter and not on the floor. They maintain daily contacts with the Reserve Bank of India and common banks and other financial institutions. As a result of their activities, government securities are quoted finely.



Task List the main key members of the stock exchanges along with their respective functions.

14.3.2 Margin Trading

Margin trading occur when investors who purchase stocks on margin borrow part of the purchase price of the stock from their brokers, and leave purchased stocks with the brokerage firm in street name because the securities are used as collateral for the loan. The interest rate of the margin credit charged by the broker is typically 1.5% above the rate charged by the bank making the loan. The bank rate (called the call money rate) is normally about 1% below the prime rate.

1. ***Percentage margin:*** The ratio of the net worth, or "equity value" of the account to the market value of the securities.

2. ***Maintenance margin:*** The required proportion of your equity to the total value of the stock. It protects the broker if the stock price declines.

3. ***Margin call:*** If the percentage margin falls below the maintenance margin, the broker issues a margin call requiring the investor to add new cash or securities to the margin account. If the investor fails to provide the required funds in time, the broker will sell the collateral stock to pay off the loan.



Example: Suppose an investor initially pays ₹ 6,000 towards the purchase of ₹ 10,000 worth of stock (₹ 100 shares at ₹ 100 per share), borrowing the remaining from the broker. The maintenance margin is set to be 30%. The initial percentage margin is 60%. If the price of the stock falls to ₹ 57.14, the value of his stock will be ₹ 5,714. Since the loan is ₹ 4,000, the percentage margin now is (5,714 – 4,000) / 5714 = 29.9%. The investor will get a margin call.

Notes

When investors acquire stock or other investments on margin, they are increasing the financial risk of the investment beyond the risk inherent in the security itself. They should increase their required rate of return accordingly.

Return on margin transaction = (change in investor's equity – interest – commission)/initial investor's equity



Example: Suppose an investor is bullish (optimistic) on Microsoft stock, which is currently selling at ₹ 100 per share. The investor has ₹ 10,000 to invest and expects the stock to go up in price by 30% during the next year. Ignoring any dividends and commissions, the expected rate of return would thus be 30% if the investor spent only ₹ 10,000 to buy 100 shares. If the investor borrows ₹ 10,000 from his broker and invest it in the stock (along with his own ₹ 10,000). Assume that the interest rate is 9% per year.

14.3.3 Role of Stock Exchanges

The stock exchange performs following functions:

1. The stock exchange provided a ready and continuous and permanent market for the purchase and sale of exiting securities. Securities traded on the exchange are easily marketable and highly liquid, less risky than other types of investment.
2. ***Evaluation of securities:*** It is an open market appraisal based on a compromise between the opinions of willing buyers and willing sellers.
3. ***Safety in Dealing:*** The motto of stock exchange is Dictum Meum Pactum i.e.: "My word is my Bond". There is high degree of commercial honor among the member of stock exchange. To ensure honesty ad integrity in trading on stock exchange, its members are selected very judiciously. The member is required to observe the rules and regulations of the stock exchange. The provision of securities contract (regulation) Act provides an element of safety to the investors.
4. ***Mobilization of saving:*** The task of mobilizing savings and directing them into productive uses is an important function. It inculcates the habit of saving, investing and risk taking among the members of general public.
5. ***Canalization of Capital:*** Through the price quotations, stock exchange helps in canalizing national saving from less profitable to most profitable sectors of economy. The investors tend to withdraw their investments from the companies with fewer prospects and invest in companies whose prospects seem to be better as reflected in their share quotations. Thus society's savings are allocated to the promising issues and invested for the maximum social advantage.
6. ***Price Stability:*** The presence of a large number of buyers and seller of securities, demand for and supply of different securities tend to equalize, thus eliminating the chances of sudden fluctuations in prices.
7. ***Economic Barometer:*** Alfred mashed puts it, "stock exchanges are not merely chief theaters of business transactions, they are also barometers which indicate the general conditions of business in a country". It is the nerve centre of economic health of a nation. It is so sensitive institution that even a small change in the political, social or economic or economic environment gets immediately reflected in the dealing on the stock exchange.
8. ***Facilities for Speculation:*** The stock exchange provides opportunities to shrewd businessmen to speculate and rep profits from fluctuations in security prices. Due to speculation, the supply of securities at different places may be equalized with demand.

Notes

9. Stock exchanges facilitate the growth of joint stock form of business enterprises. Due to the above important economic functions performed by the stock exchanges, they have earned a variety of names. A stock exchange has been described as the "mart of the world" because the securities which represent the ownership property of companies all over the world are marketed there.

Since a stock exchange is the market for business in securities of business concerns, it has been referred to as the market where "business of businesses" is carried on.

14.3.4 Listing

Listing of shares, on a stock exchange, means, such shares can be bought and sold, in stock exchange.

A Company, which intends to issue shares, through prospectus, shall have to apply to one or more stock exchanges, for getting its shares listed.

The detailed and elaborate procedure of getting the shares listed on a stock exchange is monitored by SEBI. The SEBI issues guidelines and notifications from time to time with regard to listing of securities.

Once the shares are listed, they are divided into two categories:

1. Group "A" Shares
2. Group "B" Shares

Group "A" Shares are referred to as "Cleaned Securities" or "specified shares". The facility for carrying forward a transaction from one account period to another is available for these shares. Group "A" shares represent companies, with huge amount of capital, and equally a large scope for investment. These shares are frequently traded and command higher price earnings multiples.

Group "B" Shares are referred to as, Non-cleaned securities or non-specified shares. For these groups facility of carrying forward is not available.



Notes Whenever a share is moved from Group "B" to Group "A" its market price rises; likewise, when a share is shifted from Group "A" to Group "B", its market price declines. There are some criteria and guide lines, laid down by stock exchange, for shifting stocks from the non-specified list to the specified list.

14.4 Instruments of Capital Market

There are a number of capital market instruments used for market trade, including stocks, bonds, debentures, T-bills, foreign exchange, fixed deposits, and others. This market is divided into primary capital market and secondary capital market. The primary market is designed for the new issues and the secondary market is meant for the trade of existing issues. Stocks and bonds are the two basic capital market instruments used in both the primary and secondary markets. The instruments available in the capital markets are as under:

14.4.1 Equity Shares

Equity share is a share that gives equal right to holders. Equity shareholders have to share the reward and risk associated with ownership of company.

Notes



Example: ABC Company has 10,000 equity shareholders and it has earned ₹ 10,000 profit last year and assumes it may earn a loss of ₹ 10,000 in the next year. Here, the shareholder will get ₹ 1 as profit from last year and ₹ 1 loss in the coming year's loss. It is also called as ordinary share capital. Equity shareholders are the owners of the company, who have control over the working of the company. They are paid dividend at the rate recommended by Board of Directors (BoDs). The dividend rate depends on the profits, more profits more dividends and vice versa. If there are no profits, no dividends will be payable.

14.4.2 Preference Share Capital

Preference share capital gives certain privileges to its holders on the equity shareholders. Preference shareholders have privileges in two ways:

- A preferential privilege in payment of a fixed dividend. The fixed dividend may be in the form of fixed rate or fixed amount per share; and
- Preferential right as to repayment of capital in case of liquidation/winding up of the company.

Preference shares are of different types such as Cumulative preference shares, Non-cumulative Preference shares, Convertible preference shares, Redeemable preference shares, Irredeemable preference shares, Participating preference shares and Non-participating preference shares.

14.4.3 Debentures

Debentures are the debt instruments which are issued by companies to raise long term debts. The issue of debentures by public limited companies is regulated by Companies Act, 1956 and guidelines issued by SEBI on 11.6.1992. Debenture is a document which either creates a debt or acknowledges it and any document which fulfils either of these conditions is a debenture. Debentures are issued through prospects. A debenture is issued by a company and is usually in the form of a certificate which is an acknowledgement of indebtedness. They are issued under the company's seal.

14.4.4 Sweat Equity Shares

The phrase 'sweat equity' refers to equity shares given to the company's employees on favorable terms, in recognition of their work. Sweat equity usually takes the form of giving options to employees to buy shares of the company, so they become part owners and participate in the profits, apart from earning salary. This gives a boost to the sentiments of employees and motivates them to work harder towards the goals of the company. The Companies Act defines 'sweat equity shares' as equity shares issued by the company to employees or directors at a discount or for consideration other than cash for providing know how or making available rights in the nature of intellectual property rights or value additions, by whatever name called.

14.4.5 Derivatives

A derivative is a financial instrument whose characteristics and value depend upon the characteristics and value of some underlying asset typically commodity, bond, equity, currency, index, event etc. Advanced investors sometimes purchase or sell derivatives to manage the risk associated with the underlying security, to protect against fluctuations in value, or to profit from periods of inactivity or decline. Derivatives are often leveraged, such that a small movement in the underlying value can cause a large difference in the value of the derivative.

Notes

Derivatives are usually broadly categorized by:

- The relationship between the underlying and the derivative (e.g. forward, option, swap)
- The type of underlying (e.g. equity derivatives, foreign exchange derivatives and credit derivatives)
- The market in which they trade (e.g., exchange traded or over-the-counter)

Self Assessment

State whether the following statements are true or false:

8. In private placement shares are issued to foreign investors.
9. The preference shares which can be concerted into equity shares are called convertible preference shares.
10. Sweat equity shares are issued under section 79A of Companies Act, 1956.
11. Derivatives are often leveraged, such that a small movement in the underlying value can cause a small difference in the value of the derivative.
12. If there are no profits in a company then no dividends will be payable to the equity share holders.

14.5 Regulatory Framework of Capital Market

In India, the capital market is regulated by the Capital Markets Division of the Department of Economic Affairs, Ministry of Finance. The division is responsible for formulating the policies related to the orderly growth and development of the securities markets (i.e. share, debt and derivatives) as well as protecting the interest of the investors. In particular, it is responsible for (i) institutional reforms in the securities markets, (ii) building regulatory and market institutions, (iii) strengthening investor protection mechanism, and (iv) providing efficient legislative framework for securities markets, such as Securities and Exchange Board of India Act, 1992 (SEBI Act 1992); Securities Contracts (Regulation) Act, 1956; and the Depositories Act, 1996. The division administers these legislations and the rules framed thereunder.

The Securities and Exchange Board of India (SEBI) is the regulatory authority established under the SEBI Act 1992, in order to protect the interests of the investors in securities as well as promote the development of the capital market. It involves regulating the business in stock exchanges; supervising the working of stock brokers, share transfer agents, merchant bankers, underwriters, etc; as well as prohibiting unfair trade practices in the securities market. The following departments of SEBI take care of the activities in the secondary market:

- ***Market Intermediaries Registration and Supervision Department (MIRSD):*** Concerned with the registration, supervision, compliance monitoring and inspections of all market intermediaries in respect of all segments of the markets, such as equity, equity derivatives, debt and debt related derivatives.
- ***Market Regulation Department (MRD):*** Concerned with formulation of new policies as well as supervising the functioning and operations (except relating to derivatives) of securities exchanges, their subsidiaries, and market institutions such as Clearing and settlement organizations and Depositories.
- ***Derivatives and New Products Departments (DNPD):*** Concerned with supervising trading at derivatives segments of stock exchanges, introducing new products to be traded and consequent policy changes.

Notes

14.6 Financial Institutions

The financial institutions have traditionally been the major source of long-term funds for the economy. These institutions provide a variety of financial products and services to fulfill the varied needs of the commercial sector. Besides, they provide assistance to new enterprises, small and medium firms as well as to the industries established in backward areas.

14.6.1 Role of Financial Institutions

Financial institutions have been there in the world markets for a long time now. They have also made significant contributions. The two main reasons for the existence of financial institutions are:

1. Economic development
2. Financial stability.

If we penetrate a little, we will find that the second reason for the existence of financial institutions leads to the first again. In the first place, banks offer deposits that claim to be capital certain. If this promise is to be honoured, then there must be limits to the range and nature of assets that a bank can reasonably take on to its balance sheets. More generally, financial institutions perform a plethora of activities through their provision of liquidity, divisibility, informational efficiencies and risk pooling services which broaden the spectrum of risks available to investors. In this way, they encourage and improve the efficiency of investment and savings in the economy. Through the provision of a broader range of financial instruments, they are able to foster a risk management culture by attracting customers who are not as much able to bear risks.

Also, from the view of financial stability, in an economy in which the institutions are comparatively less developed, banks will inevitably be required to assume risks that otherwise might be borne by the stock market, collective investment schemes or insurance companies. One way of minimizing financial fragility in the developing economies is to encourage a diversity of financial institutions, where investors are able to assume a variety of risks outside the banking system itself. Without this diversity, there is a tendency for all risks to be bundled within the balance sheet of the banking system, which more likely may lead to severe financial crises.

The financial institutions play an important role in complementing the facilities offered by the banks in an economy. In fact, the existence of Banking Financial Institutions (BFIs) and non banking financial institutions (NBFIs) supported by efficient money and capital markets, keep the financial sector complete and enhance the overall growth of the economy.

Financial institutions are the key players in the development of the capital market in any economy. But even after their great performance, there generally remain some sectors comparatively more challenging. For them there developed a special need for special financial institutions. In fact, the need for establishing such financial institutions arose mainly because of the following causes:

1. It has been difficult for industry in general to procure sufficient long- term funds in the capital markets. There has been a lack of financial institutions to supply long-term finance to industry. AS we know, traditionally, and more popularly, commercial banks provided only short term finance. Thus some special financial institutions (SFIs) were established to ensure that industry got sufficient long-term funds in the desired sectors. And that too in accordance with the priorities determined.
2. Certain specific sections of the industry faced greater difficulties as compared with the others in procuring long-term finance. Some such sections were:
   (a) Small and medium sized organizations

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(b) Specific industries requiring funds for modernization

(c) New concerns set up by new entrepreneurial groups

(d) Concerns involved in innovation and new technological developments

(e) Concerns requiring extraordinarily large amounts of finance for a long gestation period

(f) Concerns in backward areas. One of the very important needs for SFIs was to meet the long-term financial requirement of such organizations on economic and social grounds.

In general it can be said that the gap between the demand for and supply of finance in general and industrial finance more specifically, is sought to be filled through term loans being offered by various financial institutions. And this makes itself as the most important need for financial institutions.

14.7 Classification of Financial Institutions

Financial institutions can be of different types in accordance with the difference in the financial systems of different economies. In India, the financial system includes various types.

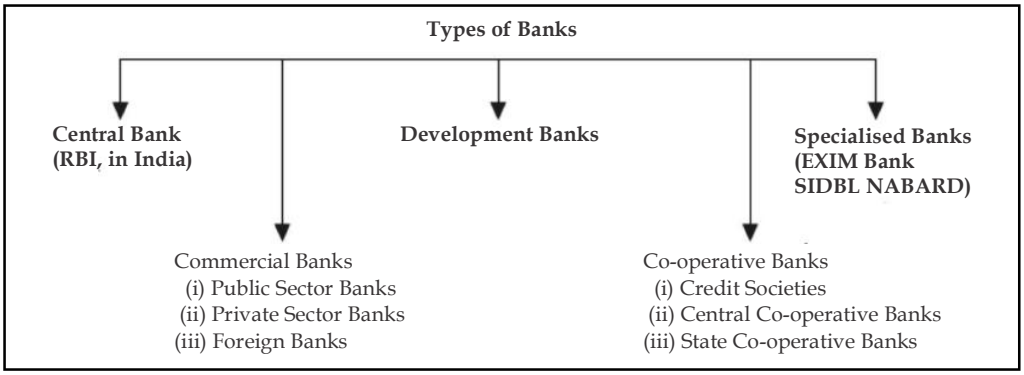
We can classify financial institutions into two categories:

- Banking
- Non-banking institutions

14.7.1 Banking Institutions

The Banking institutions in India can be broadly grouped under two categories viz., (i) scheduled, and (ii) non-scheduled. Since 1951 there has been a significant decline in the number of these institutions. From a total of 566 banks (of both categories) in 1951, the number had come down to only 109 in 1965. The reduction in the number of non- scheduled banks has been phenomenal — from 473 to mere 33; and the scheduled banks from 92 in 1951 to 76 in 1965. As is only natural, with reduction in numbers on the one side and growth in banking deposits on the other, it has led to larger concentration within the banking sector.

There are various types of banks which operate in our country to meet the financial requirements of different categories of people engaged in agriculture, business, profession, etc. On the basis of functions, the banking institutions in India may be divided into the following types:



Now let us learn about each of these banks in detail.

Notes

Central Bank

A bank which is entrusted with the functions of guiding and regulating the banking system of a country is known as its Central bank. Such a bank does not deal with the general public. It acts essentially as Government's banker, maintain deposit accounts of all other banks and advances money to other banks, when needed. The Central Bank provides guidance to other banks whenever they face any problem. It is therefore known as the banker's bank. The Reserve Bank of India is the central bank of our country.

The Central Bank maintains record of Government revenue and expenditure under various heads.

It also advises the Government on monetary and credit policies and decides on the interest rates for bank deposits and bank loans. In addition, foreign exchange rates are also determined by the central bank. Another important function of the Central Bank is the issuance of currency notes, regulating their circulation in the country by different methods. No other bank than the Central Bank can issue currency.

Commercial Banks

Commercial Banks are banking institutions that accept deposits and grant short-term loans and advances to their customers. In addition to giving short-term loans, commercial banks also give medium-term and long-term loan to business enterprises. Nowadays some of the commercial banks are also providing housing loan on a long-term basis to individuals. There are also many other functions of commercial banks.

Types of Commercial Banks

Commercial banks are of three types i.e., Public sector banks, Private sector banks and foreign banks.

(i) ***Public Sector Banks:*** These are banks where majority stake is held by the Government of India or Reserve Bank of India. Examples of public sector banks are: State Bank of India, Corporation Bank, Bank of Baroda and Dena Bank, etc.

(ii) ***Private Sectors Banks:*** In case of private sector banks majority of share capital of the bank is held by private individuals. These banks are registered as companies with limited liability. For example, The Jammu and Kashmir Bank Ltd., Bank of Rajasthan Ltd., Development Credit Bank Ltd, Lord Krishna Bank Ltd., Bharat Overseas Bank Ltd., Global Trust Bank, Vysya Bank, etc.

(iii) ***Foreign Banks:*** These banks are registered and have their headquarters in a foreign country but operate their branches in our country. Some of the foreign banks operating in our country are Hong Kong and Shanghai Banking Corporation (HSBC), Citibank, American Express Bank, Standard & Chartered Bank, Grindlay's Bank, etc. The number of foreign banks operating in our country has increased since the financial sector reforms of 1991.

Development Banks

Business often requires medium and long-term capital for purchase of machinery and equipment, for using latest technology, or for expansion and modernization. Such financial assistance is provided by Development Banks. They also undertake other development measures like subscribing to the shares and debentures issued by companies, in case of under subscription of the issue by the public. Industrial Finance Corporation of India (IFCI) and State Financial Corporations (SFCs) are examples of development banks in India.

Notes

Co-operative Banks

People who come together to jointly serve their common interest often form a co-operative society under the Co-operative Societies Act. When a co-operative society engages itself in banking business it is called a Co-operative Bank. The society has to obtain a licence from the Reserve Bank of India before starting banking business. Any co-operative bank as a society is to function under the overall supervision of the Registrar, Co-operative Societies of the State.



Notes As regards banking business, the society must follow the guidelines set and issued by the Reserve Bank of India.

Types of Co-operative Banks

There are three types of co-operative banks operating in our country. They are primary credit societies, central co-operative banks and state co-operative banks. These banks are organized at three levels, village or town level, district level and state level.

(i) ***Primary Credit Societies:*** These are formed at the village or town level with borrower and non-borrower members residing in one locality. The operations of each society are restricted to a small area so that the members know each other and are able to watch over the activities of all members to prevent frauds.

(ii) ***Central Co-operative Banks:*** These banks operate at the district level having some of the primary credit societies belonging to the same district as their members. These banks provide loans to their members (i.e., primary credit societies) and function as a link between the primary credit societies and state co-operative banks.

(iii) ***State Co-operative Banks:*** These are the apex (highest level) co-operative banks in all the states of the country. They mobilise funds and help in its proper channelisation among various sectors. The money reaches the individual borrowers from the state co-operative banks through the central co-operative banks and the primary credit societies.



Task Give two examples of the following banks:

1. Public sector banks
2. Private bank
3. Regional Rural bank
4. Foreign bank
5. State Cooperative bank

Specialized Banks

There are some banks, which cater to the requirements and provide overall support for setting up business in specific areas of activity. EXIM Bank, SIDBI and NABARD are examples of such banks. They engage themselves in some specific area or activity and thus, are called specialised banks. Let us know about them.

(i) ***Export Import Bank of India (EXIM Bank):*** If you want to set up a business for exporting products abroad or importing products from foreign countries for sale in our country, EXIM bank can provide you the required support and assistance. The bank grants loans to exporters and importers and also provides information about the international market. It gives guidance about the opportunities for export or import, the risks involved in it and the competition to be faced, etc.

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(ii) ***Small Industries Development Bank of India (SIDBI):*** If you want to establish a small-scale business unit or industry, loan on easy terms can be available through SIDBI. It also finances modernization of small-scale industrial units, use of new technology and market activities. The aim and focus of SIDBI is to promote, finance and develop small-scale industries.

(iii) ***National Bank for Agricultural and Rural Development (NABARD):*** It is a central or apex institution for financing agricultural and rural sectors. If a person is engaged in agriculture or other activities like handloom weaving, fishing, etc. NABARD can provide credit, both short-term and long-term, through regional rural banks. It provides financial assistance, especially, to co-operative credit, in the field of agriculture, small-scale industries, cottage and village industries handicrafts and allied economic activities in rural areas.

14.7.2 Non-banking Financial Institutions

Non-banking Financial Companies play an important and crucial role in broadening access to financial services, enhancing competition and diversification of the financial sector.

NBFCs provide range of financial services to their clients. Types of services under non-banking finance services include the following:

1. Hire Purchase Services
2. Leasing Services
3. Housing Finance Services
4. Asset Management Services
5. Venture Capital Services
6. Mutual Benefit Finance Services

Non-bank financial companies (NBFCs) are financial institutions that provide banking services without meeting the legal definition of a bank, i.e. one that does not hold a banking license. Operations are, regardless of this, still exercised under bank regulation.

The various types of NBFC's have been discussed below:

Industrial Finance Corporation of India (IFCI)

The main functions of IFCI include:

- Direct financial support (by way of rupee term loans as well as foreign currency loans) to industrial units for undertaking new projects, expansion, modernization, diversification etc.
- Subscription and underwriting of public issues of shares and debentures.
- Guaranteeing of foreign currency loans and also deferred payment guarantees.
- Merchant banking, leasing and equipment finance.

State-level Financial Institutions SFCs

SFCs are the State-level financial institutions which play a crucial role in the development of small and medium enterprises in the concerned States. They provide financial assistance in the form of term loans, direct subscription to equity/debentures, guarantees, discounting of bills of exchange and seed/special capital, etc. SFCs have been set up with the objective of catalysing

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higher investment, generating greater employment and widening the ownership base of industries. They have also started providing assistance to newer types of business activities like floriculture, tissue culture, poultry farming, commercial complexes and services related to engineering, marketing, etc.



Did u know? IFCI was established to cater to the financial needs of industrial concerns in large scale corporate and co-operative sectors. Small and medium sized enterprises were outside the purview of IFCI. To meet the financial needs of small and medium enterprises, the government of India passed the State Financial Corporation Act in 1951, empowering the State governments to establish development banks for their respective regions.

Under the Act, SFCs have been established by State governments to meet the financial requirements of medium and small sized enterprises. There are 18 SFCs at present.

State Industrial Development Corporations (SIDC)

Without Industrial Development there cannot be any higher standard of living for our people.

— Jawaharlal Nehru

State Industrial Development Corporations (SIDCs) have been established under the Companies Act, 1956, as wholly-owned undertakings of State Governments. They have been set up with the aim of promoting industrial development in the respective States and providing financial assistance to small entrepreneurs.

They are also involved in setting up of medium and large industrial projects in the joint sector/ assisted sector in collaboration with private entrepreneurs or wholly-owned subsidiaries. They are undertaking a variety of promotional activities such as preparation of feasibility reports; conducting industrial potential surveys; entrepreneurship training and development programmes; as well as developing industrial areas/estates.

Mutual Funds

A mutual fund is a trust that pools the savings of a number of investors who share a common financial goal. The money, thus, collected is then invested in capital market instruments such as shares, debentures and other securities. The income earned through these investments and the capital appreciation realised are shared by its unit holders in proportion to the number of units owned by them. Thus, a mutual fund is the most suitable investment for the common man as it offers an opportunity to invest in a diversified, professionally managed basket of securities at a relatively low cost.

Types of Mutual Funds

There are two major categories of mutual funds which are as follows:

1. Closed-end mutual funds.
2. Open-end mutual funds.

Closed-end mutual funds: These are the mutual funds where Investment Company cannot sell share units after its initial offering. The key characteristics of closed-end mutual funds are:

- Closed-end mutual fund investment company cannot sell share after its initial offering
- It growth in terms of the number of share is limited

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- The shares are issued like the new issues of any other company, listed and quoted on a stock exchange
- The shares of closed-end funds are not redeemable at their NAV as in the case of open-end funds
- These shares are traded in the secondary market on a stock exchange
- The minimum amount of the fund is ₹ 20 crores or 60% of targeted amount



Example: HSBC Small Cap Fund, Birla Sun Life Pure Value fund, Canara Robeco Multicap etc.

Open-end mutual funds: Open-end mutual funds are commonly referred to as the mutual funds. The key characteristics of open ended mutual funds are as follows:

- Mutual funds do not have a fixed capitalisation
- It sells its shares to the investing public, whenever it can at their Net Asset Value per share (NAV) and stands ready to repurchase the same directly form the investing public at the net asset value per share
- Minimum amount of the fund is ₹ 50 crores or 60% of targeted amount.



Example: UTI Unit 64, Kothari Pioneer, Prima and LIC Schemes.

Credit Rating Agencies

According to SEBI, "rating" means an opinion regarding securities, expressed in the form of standard symbols or in any other standardised manner, assigned by a credit rating agency and used by the issuer of such securities, to comply with a requirement specified by these regulations.

A credit rating estimates the credit worthiness of an individual, corporation, or even a country. It is an evaluation made by credit bureaus of a borrower's overall credit history.



Did u know? The main credit rating agencies operating in India are:

- Credit Rating Information Services of India Limited (CRISIL)
- Investment Information and Credit Rating Agency of India (ICRA)
- Credit Analysis & Research Limited (CARE)
- Duff & Phelps Credit Rating India Private Ltd. (DCR India)
- ONICRA Credit Rating Agency of India Ltd.

Credit Reporting and Debt Collection: Though the Credit Reporting and Debt Collection is more in scattered form, it includes companies like that of:

- Trustman Credit Management Services
- Pankaj Saraf

Insurance Companies

Insurance companies are in the business of assuming risk on behalf of their customers in exchange for a fee, called a premium. Insurance companies make a profit by charging premiums that are sufficient to pay the expected claims to the company plus a profit.

Notes

There is an existence of many insurance companies in Indian market. The main of them are:

- General Insurance Corporation of India Ltd.
- Life Insurance Corporation
- New India Assurance Company
- United India Insurance Company

Merchant Banks

Merchant Banking Companies registered with the Securities and Exchange Board of India as a Merchant Banker under Section 12 of the Securities and Exchange Board of India Act, 1992 and is carrying on the business of merchant Banker in accordance with the Securities and Exchange Board of India Merchant Banking (Rules) 1992 and Securities and Exchange Board of India Merchant Banking (Regulations) 1992 and does not carry any financial activity and does not accept or hold public deposits.

Merchant banks are institutions like,



Example:

- Bajaj Capital Limited
- Standard Chartered Bank
- SMC Global Securities Limited
- SPA Merchant Bankers Limited

Venture Capitalists

Venture capitalists are the institutions that deal in venture capital**.** Venture capital (also known as VC or Venture) is a type of private equity capital typically provided to early-stage, high-potential, and growth companies in the interest of generating a return through an eventual realization event such as an IPO or trade sale of the company.



Example:

- 2i Capital (India) Private Limited
- Actis
- Artiman Ventures
- Avon Capital Services Ltd
- Baring Private Equity Partners (India) Limited
- Berkeley Finance & Consulting
- BlueRun Ventures
- Canbank Venture Capital Fund Limited
- ChrysCapital
- Global Technology Ventures Ltd.

Notes

Self Assessment

Fill in the blanks:

13. The …… .maintains record of Government revenue and expenditure under various heads.
14. There are …… types of co-operative banks operating in our country.
15. The …… bank grants loans to exporters and importers and also provides information about the international market.
16. IFCI was established to cater to the financial needs of industrial concerns in …… and …… sectors.
17. The forte of NBFCs has been credit delivery to areas not covered by …… and financial institution.
18. …… are financial institutions that provide banking services without meeting the legal definition of a bank.
19. IFCI has played a key role in the development of cooperatives in the …… and …… sectors.

14.8 Regulatory Bodies

Regulation of financial institutions is very important for a structured growth of a country. As you know that the financial institutions play the key role in the growth of an economy so it is important to regulate the financial institutions. In India Reserve Bank of India (RBI) and Securities and Exchange Board of India (SEBI) are the main regulators of financial institutions.

14.8.1 Reserve Bank of India (RBI)

The Reserve Bank of India was established on April 1, 1935, under the Reserve Bank of India Act, 1934. The main functions of the Bank are to act as the note-issuing authority. Banker's Bank, Banker to the government and to promote the growth of the economy. The Bank also performs a wide range of promotional functions to support the pace of economic development. The Reserve Bank is the controller of foreign exchanges and worked as the watchdog of the entire financial system.

The RBI, as the central bank of the country, is the centre of the Indian Financial and Monetary System.

Its role in bank management is quite unique. The RBI performs the four basic functions of management, viz., planning, organising, directing and controlling in laying a strong foundation for the functioning of commercial bank.

14.8.2 Securities and Exchange Board of India (SEBI)

Objectives of SEBI

According to SEBI Act, 1992 the overall objective of the SEBI is "to protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto". To elaborate, the SEBI regulates stock exchanges and securities industry to promote their orderly functioning. It protects the rights and interests of investors, particularly individual investors, and guides them. It prevents

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trading malpractices and aims at achieving a balance between self-regulation by securities industry and its statutory regulation.

14.8.3 IRDA Act, 1999

The Insurance Regulatory and Development Authority (IRDA) is a national agency of the Government of India, based in Hyderabad. It was formed by an act of Indian Parliament known as IRDA Act 1999, which was amended in 2002 to incorporate some emerging requirements. Mission of IRDA as stated in the act is "to protect the interests of the policyholders, to regulate, promote and ensure orderly growth of the insurance industry and for matters connected therewith or incidental thereto."



Case Study

Emerging Trends in Capital Markets

The Indian capital market is more than a century old. Its history goes back to 1875, when 22 brokers formed the Bombay Stock Exchange (BSE). Over the period, the Indian securities market has evolved continuously to become one of the most dynamic, modern, and efficient securities markets in Asia. Today, Indian market confirms to best international practices and standards both in terms of structure and in terms of operating efficiency.

Indian financial market is also witnessing significant changes for some time. In recent past, it has experienced paradigm shift in terms of global M&A activity, big ticket IPOs, renewed interest of FIIs, private equity deals, hedge funds, international listing of Indian securities and the effect of global recession and recovery. Indian financial market is no more immune to global events and getting increasingly integrated with global market.

But with all these, volatility in Indian stock market has also become the hallmark of the day. With multiple TV channels airing expert comments on buy and sell recommendations, equity pricing projections, and effect of events happening all over the world; equity valuation has taken different meaning now. Sometimes, the bond or debt market start looking much more lucrative as an investment option with rising yields.

Questions

1. What are the emerging trends in the Indian capital market in this decade – how to act accordingly?
2. What are the main factors behind the volatility in Indian stock market?

14.9 Summary

- In capital market two types of market exists i.e. Primary and Secondary.
- Primary market is also known as new issue market and Secondary market is also known as Stock exchange market. Role of supplying the capital is direct in the primary market and indirect in Secondary market.
- In the secondary market, there are basically three parties to a transaction. These are buyers, sellers and intermediaries between them.
- The stock exchange provided a ready, continuous and permanent market for the purchase and sale of exiting securities. Securities traded on the exchange are easily marketable and highly liquid, less risky than other types of investment.

Notes

- In India, the capital market is regulated by the Capital Markets Division of the Department of Economic Affairs, Ministry of Finance.
- The Securities and Exchange Board of India (SEBI) is the regulatory authority established under the SEBI Act 1992, in order to protect the interests of the investors in securities as well as promote the development of the capital market.
- Trading on stock exchanges is done through brokers and dealers. All members can act as brokers and or this purpose they have to maintain security deposits. Brokers act as agents buying and selling or others for which they receive brokerage commission at stipulated rates. Dealers act as principals and sell securities on their own accounts.
- Mutual fund means a fund established in the form of a trust to raise monies through the sale of units to the public or a section of public under one or more schemes for investing in securities, in accordance with regulations.
- Credit rating is a symbolic indication of the current opinion regarding the relative capability of a corporate entity to service its debt obligations in time with reference to the instrument being rated.

14.10 Keywords

Book Building: Book building is the process of setting price under a certain price band.

Capital Market: The capital market is designed to finance the long-term investments. The transactions taking place in this market will be for periods over a year.

Central Bank: The bank that provides financial and banking services to the government of a country and its commercial banking system and which implements the government's monetary policy.

Commercial Bank: A financial institution that provides commercial banking services. A commercial bank accepts deposits, gives business loans and provides other services to businesses.

Commission Broker: The commission broker executes buying and selling on the floor of the stock exchange.

Debenture: A debenture is a document evidencing a debt or acknowledging it and any document which fulfills either of these conditions is a debenture.

Equity Shares: Equity shares having voting rights at all general meetings of the company. These votes have the affect of the controlling the management of the company.

Mutual Funds: A mutual fund is a trust that pools the savings of a number of investors who share a common financial goal.

Percentage Margin: The ratio of the net worth, or "equity value" of the account to the market value of the securities.

Sweat Equity Shares: The phrase 'sweat equity' refers to equity shares given to the company's employees on favorable terms, in recognition of their work.

14.11 Review Questions

1. Define primary market. What are the key methods of issuing shares in primary market?
2. Describe the role of primary market in India financial market.
3. Define secondary market.

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4. Explain the trading system in stock exchanges.
5. What are the key instruments of capital market? Discuss briefly.
6. Write a note on following:
   (a) Book building
   (b) Different types of debentures
   (c) Sweat equity shares
   (d) Derivatives
7. Analyze the importance of capital market in India.
8. Differentiate between:
   (a) Equity share and Preference share
   (b) Debentures and Derivatives
   (c) Primary Market and Secondary market
   (d) Money market and Capital market
9. Describe the policy initiatives that have been undertaken in the secondary market during last few years.
10. Comment: "The Indian capital market acts as an intermediary to mobilize savings and to channelize the same for productive use consistent with national priorities."
11. "Mutual funds companies create the market." Do you agree with this statement?
12. Discuss the role of financial institutions.
13. Explain the different types of financial institutions in India.
14. Describe the key regulatory bodies of financial institutions.

Answers: Self Assessment

1.	New Issue Market	2.	Distribution
3.	Two	4.	Two
5.	Book Building	6.	Origination
7.	Capital	8.	False
9.	True	10.	True
11.	False	12.	True
13.	Central Bank	14.	Four
15.	EXIM	16.	Large scale corporate, cooperative
17.	Banks	18.	Non banking financial companies (NBFCs)
19.	Sugar, textile		

Notes

14.12 Further Readings



Books

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