Financial Management

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PAPER I

Chapter I

Introduction to Financial Management

After reading this chapter, you will be conversant with:

- Nature and Objective of Financial Management
- Role of the Finance Manager
- Interface between Finance and Other Functions
- Environment of Corporate Finance

SECTION 1

NATURE AND OBJECTIVE FINANCIAL MANAGEMENT

One participant in a course titled, 'Finance for Non-Finance Executives' made a very interesting observation during the discussion. He said, "There are no executive development programs titled 'Production Management for Non-Production Executives' or 'Marketing Management for Non-Marketing Executives' and so on. Then how come books and Executive Development Programs titled 'Finance for Non-Finance Executives' are so popular among managers of all functions like marketing, production, personnel, R&D, etc.?"

The answer is very simple. The common thread running through all the decisions taken by the various managers is money and there is hardly any manager working in any organization to whom money does not matter. To illustrate this point, let us consider the following instances.

The R&D manager has to justify the money spent on research by coming up with new products and processes which would help to reduce costs and increase revenue. If the R&D department is like a bottomless pit only swallowing more and more money but not giving any positive results in return, then the management would have no choice but to close it. No commercial entity runs a R&D department to conduct infructuous basic research.

Likewise the materials manager should be aware that inventory of different items in stores is nothing but money in the shape of inventory. He should make efforts to reduce inventory so that the funds released could be put to more productive use. At the same time, he should also ensure that inventory of materials does not reach such a low level as to interrupt the production process. He has to achieve the right balance between too much and too little inventory. This is called the 'liquidity-profitability trade-off' about which you will read more in the lessons on Working Capital Management. The same is true with regard to every activity in an organization. The results of all activities in an organization are reflected in the financial statements in rupees. The Finance Manager, as his very designation implies, should be involved in all financial matters of the organization since almost all activities in the organization have financial implications. It would therefore not be inaccurate to say that the Finance Manager is involved in most decisions of the organization. Let us try to understand what financial management is by examining what the Finance Manager does and with what objectives.

Let us examine the objective sought to be achieved by a Finance Manager. Suppose he manages to make available the required funds at an acceptable cost and that the funds are suitably invested and that everything goes according to plan because of the effective control measures employed by him. If the firm is a commercial or profit-seeking firm, then the results of good performance are reflected in the profits the firm earns. How are the profits utilized? They are partly distributed among the owners as dividends and partly recycled into the operations of the firm. As this process continues over a period of time the value of the firm increases for the simple reason that the firm is able to generate attractive surpluses from operations. If the shares of a firm[1] are traded on the stock exchange, the good performance of the firm is reflected in the price at which its shares are traded. When the firm's shares attract a good price, the owners or shareholders are better off because they would realize much more than what they had invested. Their wealth increases. So, we can see that as a result of good financial management the value of the company to the owners (shareholders) increases, thereby increasing their wealth. Therefore, we can say that the objective of a Finance Manager is to

1 Throughout the study material, the terms 'firm' and 'company' have been used interchangeably.

increase or maximize the wealth of the owners by increasing the value of the firm which is reflected in its Earnings Per Share (EPS)[2] and the market price of its shares.

In the case of public sector companies, till recently the only objective was to increase the wealth to the society and nation at large. This objective was achieved by ensuring availability of essential goods and services to all citizens in all corners of the country, uniform development of all regions in the country, providing employment opportunities, investing in projects with long gestation periods where private investment may not be forthcoming and investing in import-substitution industries, etc. But now the public sector has also come to realize that they have to perform in order to exist and that its products/services will not be subsidized any longer by the government. Public Sector Undertakings (PSUs) are now going in for disinvestment and privatization for increased efficiency.

ROLE OF A FINANCE MANAGER

The Finance Manager is engaged in the following activities:

Mobilization of Funds

The Finance Manager has to plan for and mobilize the required funds from various sources when they are required and at an acceptable cost. This decision is called the Financing Decision. For this purpose he would be liaising with banks and financial institutions. He also deals with merchant banking agencies for procuring funds from the public through issue of shares, debentures and inviting the public to subscribe to its fixed deposits. In deciding how much to procure from various sources, he would weigh many considerations like the cost of the funds in the form of interest/dividend and the cost of public issue in the case of shares and debentures, the length of time for which funds would be available, etc. Banks and other financial institutions which give short-term and long-term loans generally lay down some conditions. These conditions are aimed at ensuring the safety of the loans given by them and contain provisions restricting the freedom of the borrower to raise loans from other sources. Therefore, the Finance Manager would try to balance the advantages of having funds available with the costs and the loss of flexibility arising from the restrictive provisions of the loan contract.

Let us take a look at a real life example:

XYZ Limited, a well-known company in computer training, software development, information systems, consultancy, etc. is undertaking a modernization cum expansion scheme which envisages addition of new services, product lines and upgradation of existing systems. The cost of this expansion cum modernization program is estimated at Rs.3,578 lakh, which is going to be mobilized as follows[3] as per the prospectus of the company.

		Rs. lakh
Public issue of equity shares including premium		1,804
Term loan	– ICICI	130
Leasing	– ICICI	125
	– Others	75
Deferred payment guarantee		99
Internal accruals		1,345
		3,578

2 Earnings per share refer to the earnings of equity shareholders after all other obligations of the firm have been met.

3 The various sources of finance will be discussed in detail in the chapter on Sources of Long-term Finance.

Deployment of Funds

There are always many competing needs for the allocation of funds. In consultation with the managers of various departments such as production, marketing, personnel, R&D and the top management, the Finance Manager decides on the manner of deployment of funds in various assets such as land, buildings, machinery, materials, etc. Sometimes the managers of the various departments named above constitute an 'Investment Committee' and appraise an investment proposal along the marketing, technical and financial dimensions. The Finance Manager appraises the proposal along the financial dimensions to determine its worthiness in relation to the investment involved. This decision called the 'Investment Decision' constitutes one of the core activities of the Finance Manager.

The funds mobilized through various sources by XYZ are proposed to be deployed as follows, as indicated in the prospectus of the company.

	Rs.lakh
Buildings	985
Computers & Accessories	941
Plant & Machinery	116
Infrastructure	213
Normal Capital Expenditure	241
Repayment of Loans	283
Increase in Working Capital	799
	3,578

CONTROL OVER THE USE OF FUNDS

After deciding on projects and proposals in which the funds are to be invested and after procuring them, the Finance Manager has to continuously monitor their use in order to ensure that procurement and deployment of funds proceeds according to plan. This task of the Finance Manager is called Financial Control. The Finance Manager sends frequent reports to the Managing Director. These reports contain information in the form of facts and figures regarding the extent to which procurement and deployment of funds is proceeding according to plan. For example, the reports would inform the management regarding the extent to which credit sanctioned by banks for the day-to-day use of the firm (working capital) has been utilized and how much more can be borrowed. It would also contain information on how much money is due to the firm from various customers and how much the firm owes its suppliers. The report would also contain information on the funds required at different points of time in the future and the availability of funds from various sources including those available out of any surpluses generated internally. He would also be reporting to the top management about the performance of individual departments within the organization. All such reports are called 'Control Reports' and the whole process constitutes 'control' because it helps management to take timely corrective action to ensure that planned results are achieved.

RISK-RETURN TRADE-OFF

While making the decisions regarding investment and financing, the Finance Manager seeks to achieve the right balance between risk and return. If the firm borrows heavily to finance its operations, then the surpluses generated out of operations would be utilized to 'Service the Debt' in the form of interest and principal payments. The surplus or profit available to the owners would be reduced because of the heavy 'Debt-servicing'. If things do not work out as planned and the firm is unable to meet its obligations, the company is even exposed to the risk of insolvency. Similarly, the various investment opportunities have a certain amount of risk associated with the return and also the time when the return would materialize. The finance manager has to decide whether the opportunity is worth more than its cost and whether the additional burden of debt can be safely borne. In fact, decision making in all areas of management including financial management involves the balancing of the trade-off between risk and return.

INTERFACE BETWEEN FINANCE AND OTHER FUNCTIONS

You will recall that we started this introductory chapter by describing the pervasive nature of finance. Let us discuss in greater detail the reasons why knowledge of the financial implications of the finance manager's decisions is important to the non-finance managers. One common factor among all managers is that they use resources and since resources are obtained in exchange for money, they are in effect making the investment decision and in the process of ensuring that the investment is effectively utilized they are also performing the control function.

Marketing-Finance Interface

The Marketing Manager takes many decisions which have a significant impact on the profitability of the firm. For example, he should have a clear understanding of the impact of the credit extended to the customers on the profits of the company. Otherwise in his eagerness to meet the sales targets he is likely to extend liberal terms of credit which may put the profit plans out of gear. Similarly, he should weigh the benefits of keeping a large inventory of finished goods in anticipation of sales against the costs of maintaining that inventory. Other key decisions of the Marketing Manager which have financial implications are pricing, product promotion and advertisement, choice of product mix and distribution policy.

Production-Finance Interface

In any manufacturing firm, the Production Manager controls a major part of the investment in the form of equipment, materials and men. He should so organize his department that the equipments under his control are used most productively, the inventory of work-in-process or unfinished goods and stores and spares is optimized and the idle time and work stoppages are minimized. If the production manager can achieve this, he would be holding the cost of the output under control and thereby help in maximizing profits. He has to appreciate the fact that whereas the price at which the output can be sold is largely determined by factors external to the firm like competition, government regulations, etc. the cost of production is more amenable to his control. Similarly, he would have to make decisions regarding make or buy, buy or lease, etc. for which he has to evaluate the financial implications before arriving at a decision.

Top Management-Finance Interface

The top management, which is interested in ensuring that the firm's long-term goals are met, finds it convenient to use the financial statements as a means for keeping itself informed of the overall effectiveness of the organization. We have so far briefly reviewed the interface of finance with the non-finance functional disciplines like production, marketing, etc. Besides these, the finance function also has a strong linkage with the functions of the top management. Strategic planning and management control are two important functions of the top management. Finance function provides the basic inputs needed to undertake these activities.

With the recent liberalization of the Indian economy, abolition of the office of the Controller of Capital Issues who used to fix issue prices beforehand and efforts of the Indian economy towards globalization, finance managers are presently facing some new challenges as indicated below:

Other Challenges in Financial Management

- **Treasury Operations:** Short-term fund management must be more sophisticated. Finance managers could make speculative gains by anticipating interest rate movements.
- **Foreign Exchange:** Finance Managers will have to weigh the costs and benefits of transacting in foreign exchange particularly now that the Indian economy is going global and the future value of the rupee has became difficult to predict.

- **Financial Structuring:** An optimum mix between debt and equity will be essential. Firms will have to tailor financial instruments to suit their and investors' needs. Pricing of new issues is also an important task for the Finance Manager's portfolio now.
- **Maintaining Share Prices:** In the premium equity era, firms must ensure that share prices stay healthy. Finance managers will have to devise appropriate dividend and bonus policies.
- **Ensuring Management Control:** Equity issues at premium mean management may lose control if it is unable to take up its share entitlements. Strategies to prevent this and also initiate other steps to prevent dilution of management control are vital.

SECTION 2

ENVIRONMENT OF CORPORATE FINANCE

One of the important aspects of a Finance Manager's job is to understand the external environment in which he operates. In a country like ours where investment and financing activities are subject to numerous governmental controls and legislations, a finance manager must have a thorough understanding of the legal framework circumscribing his decisions. Let us consider the following examples to clarify the point:

- X is the market leader in dental products (toothpaste and tooth powder) and it can increase its market share by increasing production. But the finance manager of X cannot recommend a proposal for expanding the manufacturing capacity of toothpaste even though the project is certain to increase the shareholders' wealth. Why? Because toothpaste manufacture is an activity reserved for the small scale sector and the government does not permit units other than small-scale units engaged in this activity to expand their capacity.
- The confectionery products of Y enjoy a strong brand image. Its finance manager would possibly like to exploit this strength for raising funds from public through issue of shares. But he cannot resort to this option even if he so desires because Y is a private limited company and the Companies Act prohibits private limited companies from raising capital from the public.

From these examples, it is clear that the legislative framework has an important bearing on the investment and financing decisions of a firm. The next question is: Are there external factors other than legal provisions and governmental regulations that intervene in the decision making process of the finance manager? The answer is 'Yes'. The form of organization that a business entity adopts often limits the investment and financing options. For instance, a partnership firm engaged in trading yarn cannot follow Reliance and setup a Rs.400 crore petrochemical complex because the partnership form of organization limits both the size and the ability to mobilize such massive funds.

The structure of the financial markets from where the finance manager has to raise funds and the regulations governing the financial intermediaries (like banks and financial institutions) also influence the decisions of a finance manager. Last but not the least in terms of importance is the tax factor. While evaluating the feasibility of the investments the finance manager also takes into account the fiscal (tax) factors associated with these investments.

So, we find that the Finance Manager pursues his objective of owners' wealth maximization under a set of external constraints apart from the internal constraints that arise from the inherent strengths and weaknesses of each entity. This makes his job complex and interesting because he has to make optimal decisions within the framework of these constraints.

This module seeks to create an awareness and appreciation of the intervening environmental variables. We have identified four aspects of the external environment which are directly relevant to the job of the Finance Manager. They are:

- Forms of Business Organization.
- Regulatory Framework.
- Financial System (which will include financial markets and intermediaries).
- Tax Aspects.

The Important Forms of Business Organization

SOLE PROPRIETORSHIP

This type of concern is owned by a single person. The proprietor enjoys all the powers of taking and assuming risks for his/her concern. The rewards, profits, losses and incurring of all the liabilities of the business is to him/her.

The advantages of a sole proprietorship are:

- Easy and inexpensive to setup
- Few governmental regulations
- No firm tax.

The disadvantages are:

- Life of the firm is limited to the life of the owner
- Unlimited personal liabilities
- Outside fund raising is not possible and can result in lack of growth
- Tax on the income will be very high.

PARTNERSHIP

In this type of firm the business is owned by two or more persons. They are partners in business and they bear the risks and reap the rewards of the business.

The partnership comes into being through a partnership agreement or a partnership deed. The partnerships are governed by Indian Partnerships Act, 1932.

The advantages of the partnership firm are:

- Like a sole ownership firm it can be set up easily and inexpensively.
- It is relatively free from governmental regulations.
- The expertise and experience of the partners is useful to the firm's operations.

The disadvantages are:

- The life of the firm depends upon the agreement between the partners. If any of them withdraws or is met with death, it may result in dissolution of the firm.
- Possible conflict between the partners is a threat to the firm's existence.
- Personal liabilities of the partners is unlimited.
- Its ability to raise funds is limited.

COMPANIES

A group of persons working together towards a common objective is a company. It represents different kinds of associations, be it business or non-business.

The term 'Registered Company' as per Sec.3(1)(i) of the Companies Act, 1956 means a company incorporated under the Companies Act, 1956 or an existing company incorporated under any of the previous company law as specified under Sec.(3)(1)(ii) of Companies Act, 1956. A company can be a private company or a public company.

According to Sec.3(1)(iii) of the Companies Act, 1956, a private company means a company which has a minimum paid-up capital of one lakh rupees or such higher paid-up capital as may be prescribed, and by its articles – restricts the right to transfer its shares, if any; limits the number of its members to fifty, prohibits any invitation to the public to subscribe for any shares in, or debentures of the company and/or prohibits any invitation or acceptance of deposits from persons other than its members, directors or their relatives. A private company according to American terminology is called a closed corporation.

According to Sec.3(1)(iv) of the Companies Act, 1956, a public company means a company which has a minimum paid-up capital of five lakh rupees or such higher paid-up capital as may be prescribed, is not a private company and is a private company which is a subsidiary of a company which is not a private company.

Any registered company existing on the commencement of the Companies (Amendment) Act, 2000 with a paid-up capital less than the prescribed minimum amount shall within a period of two years from such commencement (i.e., 13-12-2000) enhance its paid-up capital to the prescribed amount.

Table 1.1: Distinction between a Private Company and a Public Company

Subject	Section No.	Private Company	Public Company
Commencement of Business	149	After the receipt of certificate of incorporation	After the receipt of certificate of commencement of business
Minimum number of Persons to form a Company	12(1)	Two (2)	Seven (7)
Maximum number of Persons to form a Company	12(1)	Fifty (50)	No such restriction
Minimum number of Directors	252(1)	Two (2)	Three (3)
Maximum number of Directors	259	No such restriction	Twelve (12). For more than 12 approval of central government is necessary
Appointment of Small Shareholders Director	252(1)	Not applicable	Applicable if the Co.'s paid-up capital is Rs.5 crore or more and having at least one thousand small shareholders
Appointment of Casual Director	262	Not applicable	Applicable, subject to any regulations in the articles of the company
Directors retiring by rotation	255(1)	Not applicable (Appointed in default of and subject to any regulations in the articles of the company or be appointed in general meeting of a private company, and hence the directors of a private company need not retire by rotation.)	Not less than two-third of the total number of directors are liable to retire by rotation at every annual general meeting of the company.
Director's remuneration	Schedule XIII	Not applicable	Applicable
Restrictions on	293(1)	Applicable	Applicable except with the

powers of Boards			consent of the members in the general meeting of their company
Disqualification of a director under section 274(1)(g) of the Companies Act, 1956	274(1)(g)	Not applicable	Applicable
Subscription of Shares	3(1)	Prohibits any invitation to public to subscribe for any shares in, or debentures of the co.	No such restriction
Issue of share warrants	114(1)	Not applicable	Can issue subject to authorization in the articles of the company, with the previous approval of the central government and with respect to fully paid-up shares.
Further issue of capital	81	Not applicable	Applicable subject to certain exceptions
Audit Committee	292A	Not applicable	Applicable to every public company whose paid-up capital is not less than five crores of rupees.
Statutory Meeting	165	Not applicable	Shall hold within a period of not less than one month nor more than six months from the date at which the company is entitled to commence business
Quorum for a General Meeting	174(1)	Two (2) members personally present	Five (5) members personally present
Appointment of Proxy	176(1)	Not entitled to accept more than one proxy for each member	No such restriction
Demand for poll	179(1)	One member having a right to vote on the resolution and present in person or by proxy if not more than seven such members are personally present and by two such members present in person or by proxy, if more than seven such members are personally present	Any member or members present in person or by proxy and holding shares in the company which confer a power to vote on the resolution not being less than one-tenth of the total voting power in respect of such resolution or on which an aggregate sum of not less than fifty thousand rupees has been paid-up.
Passing of resolutions by postal ballot	192A	Not applicable	Applicable to only listed public company
Intercorporate loans and Investments	372A	Not applicable	Applicable

To conclude, a public company got special privileges when compared to that of a private company. The potential to grow is remarkably high for a public company when compared to a private company. Further, the liquidity factor suffers in a

private company as high liquidity cannot be called for because of restriction on the right to transfer of its shares.

Regulatory Framework

The financial system is discussed in detail in Chapter II. Our objective in this module will be to highlight the salient features of the regulatory framework.

Corporate investment and financing decisions are limited by a governmental regulatory framework which seeks to (a) define avenues of investment available to business enterprises in different categories, ownership-wise and size-wise; (b) induce investments along certain lines by providing incentives, concessions, and reliefs; and (c) specify the procedure for raising funds from the financial markets. The important elements of this framework are: (i) Industrial Policy, (ii) Industrial Licensing Provisions and Procedures, (iii) Regulation of Foreign Collaborations and Investments, (iv) Foreign Exchange Management Act, (v) Monopolies and Restrictive Trade Practices Act, (vi) Competition Bill (vii) Companies Act, and (viii) SEBI. In this section, we will discuss the salient features of these legislations/regulations and their implications on financial management. SEBI has been covered in detail in Chapter II in the Section on Capital Markets.

INDUSTRIAL POLICY

A finance manager of a private industrial enterprise (which will include all non-government entities) must be aware of the provisions of the Industrial Policy Resolutions, 1956, Industrial Licensing Policy, 1973, and the Industrial Policy Statements made by the government from time to time because these provisions define the investment avenues open to the enterprise.

The Industrial Policy Resolution, 1956, which states the basic industrial policy of our economy, has classified industries into three categories having regard to the part, which the state (government) will play in their development. The first category covers those industries, the future development of which will be the exclusive responsibility of the state. Industries included in this category are infrastructural industries like air transport and rail transport, certain basic and heavy industries like iron and steel and heavy machinery, defense-related industries, and atomic energy. The second category consists of industries in which the state will generally take initiative to establish new undertakings but in which private enterprise will be expected to supplement the efforts of the state. This category includes industries like machine tools, essential drugs and antibiotics. The third category consists of all the remaining industries, the future development of which will be left to the initiative and enterprise of the private sector.

The other salient provisions of the Industrial Policy Resolution, 1956 and the policy documents mentioned above, can be summed up as follows:

- One of the major objectives of the Industrial Policy of the government is to promote development of the small-scale and village industries. To achieve this objective, the government is empowered to reserve manufacture of certain products exclusively for the small-scale sector. Exercising this right, the government has reserved more than 800 items for the small-scale sector, the production of which does not call for a huge capital outlay or sophisticated technology. Over time the government is dereserving these items in a phased manner.
- Large industrial houses i.e., undertakings by themselves or interconnected with other undertakings having assets of more than Rs.100 crore can participate in, and contribute to the establishment of industries specified in Appendix I of the Industrial Licensing Policy, 1973, provided the items are not reserved for the public sector or the small sector. Large industrial undertakings will usually be excluded from other industries, except where production is predominantly for exports. Appendix I includes industries like electrical equipment, industrial machinery, agricultural machinery and chemicals (other than fertilizers).
- The joint sector which involves partnership between the government and private enterprises will be used in appropriate cases for setting up industrial

undertakings. It, however, cannot be used to permit the entry of larger houses, dominant undertakings, and foreign companies in industries in which they are precluded on their own.

- Foreign companies will be eligible to participate in, and contribute to the establishment of industries in the same manner as large industrial houses. Their investment will be examined with special reference to the technological aspects, export possibilities, and the overall effects on the balance of payments.
- The Industrial Policy seeks to reduce regional disparities in industrial development. To promote this objective, the government will encourage units being located in notified backward areas through a package of incentives and concessions and will curb the tendency for industrial enterprises to concentrate around metropolitan areas.

In recent years, the government has initiated the process of liberalizing its policy towards participation of large industrial enterprises in different industries and streamlining the licensing procedures to expedite industrial development. The important policy measures announced in the recent past include:

- Abolition of licensing requirements except in the case of a selected list of 4 industry categories.
- Raising of investment ceilings for small-scale industries and ancillary units.
- Removal of Monopolies and Restrictive Trade Practices (MRTP) limits on assets for companies.
- Permitting the private sector to enter the telecommunication equipment manufacturing industry.
- Encouragement for foreign investment up to 51 percent equity of a company. On a select basis, foreign investment in 100% subsidiaries is also being encouraged now a days.
- Permitting foreign equity in companies to manufacture computers.
- Disinvestment in selected public sector units.

Industrial Licensing Provisions and Procedures

To regulate and develop industry in accordance with the objectives of the Industrial Policy Resolution and the priorities under the Five-year Plans, the government introduced the system of Industrial Licensing. To provide a legal framework for the system of licensing, the government enacted the Industries (Development & Regulation) Act, in 1951.

The existing system and procedures for industrial licensing have undergone a drastic change pursuant to the statement on Industrial Policy, tabled in both the Houses of Parliament on July 24, 1991. The statement has substantially reduced the requirement for various types of industrial approvals. Consequently, to implement this policy statement in respect of industrial licensing, a notification has been issued under the Industries (Development & Regulation) Act, 1951.

The notification has three schedules

Schedule I: Lists the industries reserved for public sector. Industries included in this schedule are Mineral Oils, Mining, Railways, Defense-related industries and Atomic Energy.

Schedule II: Lists the industries which are subject to compulsory Licensing. It includes industries like Coal & Lignite, Petroleum, Sugar, Asbestos, Raw hides, Patent Leather, Tobacco, Motor cars, Paper and Newsprint, Industrial explosives, Hazardous chemicals, Drugs and Pharmaceuticals and Entertainment electronics.

Schedule III: Lists the articles reserved for the small-scale/ancillary sector which include Textile products, Food & Allied industries, Wood, Paper products, Leather products including Footwear, Rubber, Plastic products, Chemicals, Dyes, Tiles, Glass and Ceramics.

With regard to small-scale (SSI)/ancillary industries, the following will have to be borne in mind.

Small Scale Industry is an industrial undertaking in which the investment in fixed asset in plant and machinery, excluding land and building, whether held on ownership terms or on lease or on hire purchase does not exceed Rupees Five crores (Rs.5 crore).

Under the revised definition, an ancillary unit is one which sells not less than 50 percent of its manufactured products or services to one or more industrial undertakings.

The provisions of the revised industrial licensing policy are as follows:

1. Industrial licensing is abolished for all projects except for a short list of industries (Schedule II) related to security and strategic concerns, social reasons, hazardous chemicals and overriding environmental reasons, and items of elitist consumption. Industries in the small-scale and ancillary sector are exempted from licensing all articles of manufacture which are not covered by Schedules I & II.
2. Industries where security and strategic concerns predominate will continue to be reserved for the public sector (Schedule I).
3. For projects requiring imported capital goods automatic clearance will be given where foreign exchange availability is ensured through a foreign equity.
4. For the foreign/technology collaboration under automatic route with previous ventures/tie-ups, prior approval of government would be required only where the foreign investor is having an existing joint venture or technology transfer/trade mark agreement in the 'same' field. Even for such cases, prior approval of government will not be required in
   a. Investments to be made by Venture Capital Funds registered with the SEBI; or
   b. The existing joint-venture investment by either of the parties is less than 3%; or
   c. The existing joint-venture/collaboration is defunct or sick.
5. Licensing is also waived for industrial undertakings whose proposed project is not located within 25 km from the periphery of the standard urban area limits of a city having a population of more than 10 lakh according to the 1991 census.

   This condition will not apply to electronics, computer software, printing industry and other non-polluting industries that may be notified from time to time and also to other industries that are located within the areas designated as 'industrial areas' by the state government(s) before July 25, 1991. However, the location of industrial projects will be subject to central or state environmental laws or regulations including local zoning and land use laws and regulations. As before, no change of location of an industrial unit can take place without the express permission of the central government.
6. Substantial expansion of existing units will be exempt from licensing provided the item of manufacture is not covered by Schedules I, II and III. Hitherto, expansion proposals also will need the approval of the government.

7. Existing units will be permitted to manufacture any new article without additional investment if the article is not otherwise subject to compulsory licensing. This facility would be available notwithstanding any locational conditions.
8. Existing schemes of registration namely, the Delicensed Industries Registration Scheme (DLR), Exempted Industries Registration Scheme (EIR) and registration with Directorate General for Trade and Development (DGTD) and other technical authorities, namely, the Textile Commissioner, Development Commissioner for Iron & Steel have been abolished. Entrepreneurs will henceforth only be required to file an information memorandum in prescribed form to the Secretariat of Industrial Approvals (SIA) in the Department of Industrial Development.
9. Government continues to have the authority to order investigation into the working of industrial undertaking, and if necessary takeover the management.
10. Government is empowered to control and regulate prices, methods of production, volume of production and the mode of distribution with respect to any of the essential commodities.
11. The investment limits have been raised from Rs.One crore to Rs.Five crore for seven additional items in small scale sector and further 85 SSI items are de-reserved from the reserved list.
12. A National Manufacturing Competitiveness Council (NMCC) has been established to improve the competitiveness of industry. NMCC will act as an apex body providing inputs for policymaking as well as suggesting measures for enhancing the competitiveness of the Indian Iindustry.

ESTABLISHMENT OF THE CENTRAL ADVISORY COUNCIL AND DEVELOPMENT COUNCIL

- To advise on the matters concerning the development and regulation of scheduled industries, the central government through notified order established a council called Central Advisory Council. It consists of a Chairman and such other members not exceeding thirty in number, all of whom in the option of the central government are capable of representing the interests of owners, employees and consumers of industrial undertakings in the scheduled industries and such other class of persons including primary producers. (Sec. 5 of IDRA, 1951)
- To perform assigned functions of a kind specified in the second schedule in order to increase the efficiency or productivity in the scheduled industry or group of scheduled industries both in terms of economy and in the interest of the community, and to perform such other functions as may be required to perform by or under any other provision of this Act, the central government through notified order establish a council called Development Council for such scheduled industry or group of such scheduled industries. It consists of persons of different streams who in the opinion of the central government are capable to make their council to perform its functions accurately and timely. (Sec. 6 of IDRA, 1951)

Regulation of Foreign Collaborations and Investments

Foreign collaboration involves either transfer of foreign technology (Technical collaboration) or transfer of foreign technology-cum-capital (Technical-cum-Financial collaboration). Technical collaboration entails outflow of foreign exchange in the form of royalty payments, while financial collaboration results in an outgo of foreign exchange in the form of dividend remittances and capital repatriation. So, the government follows a selective policy in approving foreign

collaboration projects. Even where it approves the collaboration in principle, it regulates the extent of foreign investment in the project, amount of royalty payments, and the terms and conditions of the collaboration agreement.

FOREIGN EXCHANGE MANAGEMENT ACT

The Foreign Exchange Regulation Act, 1973, regulated the foreign investment in India. The Foreign Exchange Management Act (FEMA) replaced the Foreign Exchange Regulation Act (FERA) with effect from June 1, 2000.

The main objectives of FEMA are: (i) to facilitate external trade and payments, and (ii) to promote an orderly maintenance of the foreign exchange market in India.

The Salient Features of the Act

- Full freedom to a person resident in India who was earlier outside India to hold or transfer any foreign security or immovable property situated outside India and acquired when he/she was resident there. Similar freedom is also given to a resident who inherits such security or immovable property from a person resident outside India.
- A person resident outside India is also permitted to hold shares, securities and properties acquired by him while he/she was resident in India. Similarly, a person resident outside India is also permitted to hold such properties inherited from a person resident in India.
- Exchange drawn can also be used for purpose other than for which it is drawn provided drawal is otherwise permitted for such purpose.
- Any person can deal or transfer or pay pursuant to any foreign transaction only in accordance with the provisions of this Act or with general or special permission of the RBI to promote and for orderly maintenance of the foreign exchange market in India.
- The responsibility is on such person resident in India to take all reasonable steps for realization and repatriation to India as prescribed by RBI the amount of foreign exchange which is due or accrued to him unless otherwise provided in the Act.
- Every exporter of goods shall furnish to RBI or to such authority a declaration as prescribed for the purpose of ensuring the realization of export proceeds by such exporter.

MONOPOLIES AND RESTRICTIVE TRADE PRACTICES ACT

Under the impact of globalization, the Competition Policy of India is linked to economic reforms with major focus on deregulation of core sectors and privatization of State owned assets. Trade liberalization along with opening up of the economy, poses dual challenges of protecting national competition and combating transnational anti-competitive business practices that affect the economy. There is a need for both a short-term and long-term policy options that can regulate the competition leverage to run the economy on a safe track with sustaining speed.

Globalization unfastened a number of Macro challenges. The domestic markets suddenly found themselves plunged into increased competition where there is no guarantee that the competition will be fair. Domestic businesses became vulnerable to cross border business conspiracies. Demand for huge amounts of funds force domestic giants to merge with multi-national corporations. The Markets will face multitude of litigations arising out of intellectual property rights and create price discrimination between countries.

India therefore are confronted with the task of formulating new rules to regulate unethical competition in international trade. The need for a comprehensive competition policy was felt in order to stop large business enterprises from taking advantage and exercising nefarious control over the markets of developing countries. Enactment of a powerful competition law became inevitable in order to curtail monopoly trends by big business enterprises.

Such a competition law must be able to stimulate domestic production and enable domestic business enterprises to compete with their foreign counterparts. The competition policy must not only contain an effective regulatory authority but also provide for dispute settlement mechanisms for settlement of trade disputes. There is also a need for increasing awareness among business enterprises, about various aspects of competition policy and the advantages derived due to adherence to norms of such policy.

A transparent and properly focused competition policy is sine qua non for framing an effective legislation. Such an efficient competition policy must address issues such as delivery of goods and services to the citizens of the country at cheap and affordable prices, encouraging innovation, minimizing the scope of barriers to competition, protecting vulnerable competitors, facilitating socio economic equality, increasing investors confidence and convergence of producers interest with the interests of consumers among other things.

In furtherance of this objective, a high level committee under the chairmanship of SVS Raghavan was constituted by the Government of India to examine the laws regulating the competition in different forms and to recommend the design for a comprehensive law that is in harmony with other international laws. The Committee submitted it s report on 22 May, 2000. A draft bill on Competition was submitted to Department of Company Affairs, Government of India.

The Committee found Monopolies Restrictive Trade Practices Act regime as obsolete and insufficient. The Bill sought to repeal the Monopolies and Restrictive Trade Practices Act (MRTPA), 1969 and the Monopolies Restrictive Trade Practices Commission (MRTPC) constituted under that Act. The Bill recommended that after the Competition Commission of India is set up and the MRTPC abolished, all the cases of unfair trade practices before the MRTPC should be transferred to the concerned consumer courts under the Consumer Protection Act, 1986. The pending monopolies and restrictive trade practices cases before MRTPC should be taken up for adjudication by the Competition Commission of India from the stages they are in. The draft bill suggested several pre-requisites for competition policy, contours of competition policy, do's and don'ts, agreement among enterprises, abuse of dominance, acquisitions and mergers to be dealt with by the proposed Commission.

Accordingly the Competition Act, 2002 (Act 12 of 2003) was published in the Official Gazette on January 14, 2003. The Preamble of the Competition Act, 2002, states that the Act "was enacted to provide, keeping in view of the economic development of the country, for the establishment of a Commission to prevent practices having adverse effect on competition, to promote and sustain competition in markets, to protect the interests of consumers and to ensure freedom of trade carried on by other participants in markets, in India." Section 66 of the Competition Act, 2002, repealed the Monopolies and Restrictive Trade Practices Act, 1969 and dissolved the Monopolies and Restrictive Trade Practices Commission established under sub-section (1) of section 5 of the said Act.

The Competition Act, 2002 provides for a regulatory framework of rules covering the critical areas of competition. The Act contains 9 chapters covering the following areas:

- Prohibition of anti-competitive agreements.
- Prohibition of abuse of dominant position.
- Regulation of combinations.

- Establishment of Competition Commission of India.
- Penalties for contravention of orders of commission and non-compliance with directions.
- Competition Advocacy.
- Constitution of Competition fund.

Apart from dealing with the competition misconduct, the Act also envisages a promotional role. The Competition Commission of India has an advocacy role in advising government and creating awareness and imparting training on competition issues. The Act provides an exhaustive coverage of definition of 'Enterprise' under Sec 2 (h), as including industrial activities, marketing activities, services including financial investments, stock broking among other things.

In the light of the commitments of WTO, Indian Competition Act, 2002 has adopted a policy option of 'accommodative approach' in the areas such as export obligation, protection of property rights, right to refrain infringement of intellectual property rights conferred under various enactments such as Copy Right Act, 1957, Patents Act, 1970, etc. While recognizing the need to prevent anti competitive alliances, the Act takes a soft stand in the areas having a bearing on larger public interest. The Act empowers Competition Commission to enquire into anti-competitive Acts taking place outside India. However the anti-trust practices recognized by countries like USA and UK do not find reference under Indian Law.

The Competition law needs to evolve further to become an instrument to achieve efficient allocation of resources, technical progress, consumer welfare and regulation of concentration of economic power.

Companies Act

The major objectives of the Companies Act, 1956 are:

- To ensure minimum standard of business integrity and conduct in the promotion and management of companies;
- To elicit full and fair disclosure of all reasonable information relating to the affairs of the company;
- To promote effective participation and control by shareholders and protect their legitimate interests;
- To enforce proper performance of duties by the company management; and
- To investigate into and intervene in the affairs of companies which are managed in a manner prejudicial to the interests of the shareholders or the public at large.

The Companies Act which has 657 sections attached with 15 schedules is a very comprehensive legislation governing the functioning of companies.

Many of the provisions of this Act have a direct bearing on the financial management of companies. The Act provides for matters like types of share capital that can be issued, issue of share capital, issue of debentures, loans, investments, inter-corporate investments, distribution of dividends, reorganization, amalgamation, and liquidation. Some of the important provisions of this Act related to the financial management of companies are listed below:

- A public limited company can issue only two kinds of shares – preference shares and equity shares.
- Any further issue of shares has to be first offered to the existing equity shareholders in proportion to the shares held by them, unless they waive this right.

- A company which completes a buy-back of shares or other specified securities under Section 77A(8) amended in 2001, it shall not make any further issue of such shares or securities within a period of 24 months from the date of completion of such buy-back subject to certain exceptions.
- Sweat equity shares be 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 through a special resolution passed by the shareholders of such company in their general meetings provided not less than one year has elapsed from the date on which the company is entitled to commence business.
- No company shall make intercorporate loans and investments exceeding sixty percent (60%) of its paid-up share capital and free reserves, or one hundred percent (100%) of its free reserves, whichever is more, unless it is approved by the shareholders of the company through passing a special resolution in their general meeting of the company, otherwise a Board resolution is sufficient.
- Dividends can be declared only out of the profits of the company arrived at after providing for depreciation in accordance with the provisions of Section 205(2) or out of the profits of the company for any previous financial year or years arrived at after providing for depreciation in accordance with those provisions and remaining undistributed or out of both or out of moneys provided by the central government or state government for the payment of dividend in pursuance of a guarantee given by that government.

The other provisions of the Companies Act which can be of interest to us are the provisions related to the maintenance of accounts, their audit and disclosure to shareholders. The Act requires all companies to prepare the annual financial statements (Profit & Loss Account and Balance Sheet) in the prescribed manner and format and get them audited by a Chartered Accountant. Further, a public company is required to present its audited financial statements to the shareholders for approval. These financial statements together with the Directors' Report, Auditors' Report and annexures to the financial statements as prescribed by the Act constitute the annual report of the company. The annual reports of companies are available to the public for inspection at the office of the Registrar of Companies in each State.

The Companies Act, 1956, in India is more than 150 years old and it has undergone several amendments in it to suit the present scenario. The recent amendment to the Act is through Companies (Amendment) Act, 2001. Some of the important amendments made to the Act are given here for the benefit of the students:

1. **Paid-up Capital:** A minimum paid-up capital limit of Rs.1.00 lakh and Rs.5.00 lakh has been fixed for private and public limited companies respectively. The existing private and public limited companies not conforming to this guideline will have to fulfill the requirement within two years from the commencement of the amendment. The new provision requiring a minimum paid-up capital is aimed at increased commitments from the promoters.
2. **Flexibility to Fix Denomination for Issue of Equity Shares:** Every eligible company shall be free to make pulbic or rights issue of equity shares in any denomination determined by it in accordance with Section 13(4) and in compliance with SEBI guidelines, 2000.

3. **Compliance Certificate:** Every company not required to appoint a whole-time company secretary under Section 383A(1) and whose paid-up capital is Rs.10 lakh or more shall file with the concerned Registrar of Companies a certificate called Secretarial compliance certificate issued by a Secretary in whole-time practice in the prescribed manner with the prescribed time to ensure whether such company has complied with all the provisions of this Act and a copy of such certificate shall be attached to the Board's report.
4. **Directors Responsibility Statement:** To highlight the accountability of directors in good corporate governance this statement has been included in the Boards' report of every company. It relates to standards, policies, records of accounting and of annual accounts of such company.
5. **Corporate Governance:** To promote and raise the standard of Corporate governance, every listed company shall attach a report on corporate government to its' Board report. Such report shall contain mandatory and non-mandatory requirements like composition of Board of Directors, appointment and structure of Audit committees, remuneration of directors, Board procedures, Management analysis and discussion report, etc.
6. **Disqualification of a Director u/s 274(1)(g):** Towards good corporate governance, every director of a public company is disqualified from being a director in case such company fails to file annual accounts and annual returns or repay its deposits, debentures or dividends along with interest, if any, for continuous period as stated.
8. **Audit Committee:** A new section has been inserted to provide for the constitution of audit committees of the board in public companies with a paid-up capital of Rs.5 crore and above. The committee will examine the audit and internal control systems and review half-yearly and annual financial statements before submission to the board. It is a major step towards good corporate governance.
9. **Secretarial Audit:** Under Section 383A, companies which have been exempted from employing a whole-time company-secretary and having a paid-up capital of Rs.10 lakh and above, it has been advised that they should obtain a certificate from whole-time practicing company secretary to the effect that the said company has followed all the provisions of the Companies Act.

SUMMARY

- The financial goal of any firm including public sector firms is to maximize the wealth of the shareholders by maximizing the value of the firm.
- The objective of financial manager is to increase or maximize the wealth of owners by increasing the value of the firm which is reflected in its earning per share and market value of the firm.
- Function of Finance manager includes mobilization of fund, deployment of fund, control over the use of fund, and balancing the trade-off between risk and return.
- The advantages of sole proprietorship are (i) easy and inexpensive setup. (ii) Few governmental regulations, and (iii) no firm tax. Partnership firm is a business owned by two or more persons. They are partners in business and they bear the risks and reap the rewards of the business. A partnership firm is governed by the Indian Partnership Act, 1932. Hence it is relatively free from

governmental regulations as compared to the joint stock companies. A group of persons working towards a common objective is a company. It represents different kinds of associations, be it business or non-business.

- Corporate investment and financing decisions are circumscribed by a government regulatory framework. The important elements of these frame work are: (i) Industrial policy (ii) Industrial licensing provisions and procedure (iii) Regulation of foreign collaborations and investment (iv) Foreign Exchange Management Act (v) Monopolies and Restrictive Trade Practice Act , (vi) Companies Act (vii) SEBI.

Chapter II

Indian Financial System

After reading this chapter, you will be conversant with:

- Financial System
- Financial Markets
- Introduction to Capital Markets
- Government Securities Market
- International Capital Markets
- Financial Institutions
- Functions of Reserve Bank of India
- Nature of Commercial Banks and Theory of Banking Operations
- Financial Sector Reforms – Privatization
- Classification of Non-Banking Financial Companies

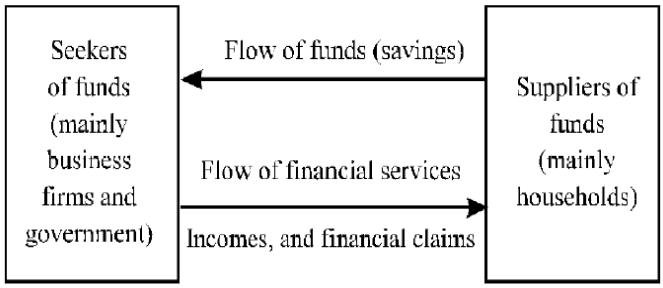
SECTION 1

FINANCIAL SYSTEM

The financial system is one of the most important inventions of the modern society. The phenomenon of imbalance in the distribution of capital or funds exists in every economic system. There are areas or people with surplus funds and there are those with a deficit. A financial system functions as an intermediary and facilitates the flow of funds from the areas of surplus to the areas of deficit. A financial system is a composition of various institutions, markets, regulations and laws, practices, money managers, analysts, transactions and claims and liabilities.

The following figure depicts a financial system. By making funds available, the financial system helps in the growth of modern economies and increase in the standard of living among its citizens.

Figure 2.1: The Financial System



The financial system helps determine both the cost and the volume of credit. The system can effect a raise in the cost of funds which adversely affects the consumption, production, employment and growth of the economy. Vice-versa, lowering the cost of credit can enhance all the above factors in the positive direction. Thus we find that a financial system has an impact on the basic existence of an economy and its citizens.

The functions performed by a financial system are:

The Savings Function

As already stated, public savings find their way into the hands of those in production through the financial system. Financial claims are issued in the money and capital markets which promise future income flows. The funds with the producers result in production of better goods and services, thereby increasing society's living standards. When the savings flows decline, however, the growth of investment and living standard begins to fall.

Liquidity Function

Money in the form of deposits offers the least risk, of all financial instruments. But its value is most eroded by inflation. That is why one always prefers to store the funds in financial instruments like stocks, bonds, debentures, etc. The compromise one makes in such investments is that (i) the risk involved is more, and (ii) the degree of liquidity, i.e., conversion of the claims into money is less. The financial markets provide the investor with the opportunity to liquidate the investments.

Payment Function

The financial system offers a very convenient mode of payment for goods and services. The cheque system, credit card system *et al.* are the easiest methods of payments. The cost and time of transactions are drastically reduced. In India, the cheque system of payment is widely practiced. The credit card system has entered only urban India and is widely used to pay for consumption expenditure.

Risk Function

The financial markets provide protection against life, health and income risks. These are accomplished through the sale of life and health insurance and property insurance policies. The financial markets provide immense opportunities for the investor to hedge himself against or reduce the possible risks involved in various investments.

Policy Function

India is a mixed economy. The government intervenes in the financial system to influence macroeconomic variables like interest rates or inflation. In 1996-97, by bringing about several cuts in the CRR from 12% to 10% the government, the RBI tried to force the interest rates down and increase the availability of credit to the corporates at cheaper rates. Modern day economies require huge sums of money for investment in capital assets (land, equipment, factory, etc.) which are then used for providing goods and services. The funds required are so huge that it is not possible for a single government/firm to provide them. By selling financial claims like stocks, bonds, etc. the required funds can be quickly raised from a variety of investors. The business firm/government issuing such a financial claim then hopes to return the borrowed funds from expected future inflows. Indeed, we see that the financial markets within the financial system have made possible the exchange of current income for future income and transformation of savings into investments, so that production and income grow.

FINANCIAL MARKETS

A financial market can be defined as the market in which financial assets are created or transferred. Financial assets 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. Financial markets are sometimes classified as primary and secondary markets. But, more often financial markets are classified as money markets and capital markets. The distinction between the two markets is based on the differences in the period of maturity of the financial assets issued in these markets. Money market deals with all transactions in short-term instruments (with a period of maturity of one year or less like treasury bills, bills of exchange, etc.) whereas capital market deals with transactions related to long-term instruments (with a period of maturity of above one year like corporate debentures, government bonds, etc.) and stock (equity and preference shares).

Money Market

One of the important functions of a well-developed money market is to channel savings into short-term productive investments like working capital. Call Money Markets, Treasury Bills Market and Markets for Commercial Paper and Certificate of Deposits are some of the examples of a Money Market.

CALL MONEY MARKET

The call money market forms a part of the national money market, where day-to-day surplus funds, mostly of banks, are traded. The call money loans are of very short-term in nature and the maturity period of these loans vary from 1 to 15 days. The money that is lent for one day in this market is known as ‘call money’, and if it exceeds one day (but less than 15 days), it is referred as ‘notice money’. In this market, any amount could be lent or borrowed at a convenient interest rate which is acceptable to both the borrower and lender. These loans are considered as highly liquid, as they are repayable on demand at the option of either the lender or borrower.

Purpose

Call money is borrowed from the market to meet various requirements of commercial bill market and banks.

The commercial bill market borrows call money for short periods to discount commercial bills. Banks borrow in call market to:

- Fill the temporary gaps, or mismatches that arise, as the banks normally lend out the deposits they mobilize.
- Meet the Cash Reserve Ratio (CRR) requirements which they should maintain with RBI.
- Meet sudden demand for funds, which may arise due to large payments and remittances.

Banks usually borrow from the market to avoid the penal interest rate which is imposed on them for not meeting CRR requirements and high cost of refinance from RBI. Call money essentially serves the purpose of equilibrating the short-term liquidity position of banks.

Location

In India, call money markets are mainly located in commercial centers and big industrial centers such as Mumbai, Kolkata, Chennai, Delhi and Ahmedabad. Mumbai and Kolkata form significant portion in trading. Due to the location of the biggest stock exchange, head offices of RBI and many other banks, Mumbai plays a predominant role as far as volume of funds is concerned.

Participants

Earlier only few large banks, were operating in the market. However, the market has expanded and now scheduled, non-scheduled commercial banks, foreign banks, state, district and urban co-operative banks, financial institutions such as LIC, UTI, GIC and its subsidiaries, IDBI, NABARD, ICICI, IRBI, ECGC, EXIM Bank, IFCI, NHB, SCICI, TFCI and SIDBI, Mutual funds such as SBI Mutual Fund, Canbank Mutual Fund, LIC Mutual Fund, Indian Bank Mutual Fund, PNB Mutual Fund and GIC Mutual Fund and the RBI Intermediaries like Discount and Finance House of India (DFHI) and Securities Trading Corporation of India Limited (STCI) participate in the local call money markets.

Participants in this market are split into two categories. The first comprises those who can both borrow and lend in this market, such as RBI, its intermediaries like DFHI and STCI and commercial banks. The second category comprises of only lenders, like financial institutions and mutual funds (who cannot borrow from this market).

Call Rates

The interest paid on call loan is known as the call rates. Unlike in the case of other short-term and long-term rates, the call rate is expected to freely reflect the day-to-day availability of funds. These rates vary highly from day-to-day, often from hour to hour. While high rates indicate a tightness of liquidity in the financial system, low rates indicate an easy liquidity position in the market. The rate is largely subjected to be influenced by the forces of supply and demand for funds.

The call money rates had fluctuated from time to time reflecting the seasonal variations in fund requirements till recently. Call rates climb high during busy seasons in relation to those in slack seasons. These seasonal variations were high due to a limited number of lenders and many borrowers. The entry of financial institutions and money market mutual funds into the call market has reduced the demand supply gap and these fluctuations gradually have came down in recent years.

Though the seasonal fluctuations were reduced to considerable extent, there are still wide variations in the call rates.

The extreme volatility of the call rate can be attributed to the following factors such as:

a. Large borrowings by banks to meet the CRR requirements on certain dates cause a great demand for call rates. These rates usually go up during the first week to meet CRR requirements and subside in the second week once the CRR requirements are met.

b. The overextension of loans by banks, in excess of their own resources make the banks depend on the call market. They use the call market as a source of funds for meeting structural disequilibria in their sources and uses of funds.

c. The withdrawal of funds to meet business requirements by institutional lenders and to pay advance tax by the corporate sector lead to steep increase in call money rates in the market.

d. The banks invest funds in Government securities, units of UTI, public sector bonds in order to maximize the earnings from their funds management. But with no buyers in the market, these instruments tend to become illiquid which accentuates the liquidity crises in the call market, pushing up the call rates significantly high. Thus, liquidity crisis or illiquidity in the money markets also contributes to the volatility in the market.

TREASURY BILLS

This is dealt with in detail in the next sub-heading 'Government Securities Market'.

COMMERCIAL PAPER AND CERTIFICATE OF DEPOSITS

Commercial Papers (CPs) and Certificate of Deposits (CDs) are money market instruments launched in early nineties, and the market for these instruments are not well-developed in India when compared to foreign countries.

COMMERCIAL PAPER (CP)

Based on the recommendations of Working Group on Money Markets, the RBI introduced Commercial Paper (CP) in 1990 enabling highly rated corporate borrowers, to diversify their sources of short-term borrowings and to provide an additional instrument to investors.

Definition

Commercial Paper (CP) is an unsecured usance money market instrument issued in the form of a promissory note at a discount, and is transferable by endorsement and delivery and is of fixed maturity.

Subscribers

CP may be issued to and held by individuals, banking companies, other corporate bodies registered or incorporated in India and unincorporated bodies, non-resident Indians (NRIs) and Foreign Institutional Investors (FIIs). However, investment by FIIs would be within the limits set for their investments by Securities and Exchange Board of India (SEBI). When NRIs subscribe to CP issue, the conditions regarding non-repatriability and non-endorsability are indicated on the CP.

Salient Features

- The CP market has the advantage of giving highly rated corporate borrowers cheaper funds that they could obtain from the banks while still providing institutional investors with higher interest earnings than they could obtain from the banking system.
- CDs can be issued by Corporate, primary dealers (PDs), and the all-India Financial Institutions (FIs) that have been permitted to raise short-term resources under the umbrella limit fixed by Reserve Bank of India are eligible to issue CP. Satellite dealers have been discounted from issuing CPs with effect from June 1, 2002.
- CP will be issued at a discount to face value as may be determined by the issuer and no issuer shall have the issue of CP underwritten or co-accepted. CP are issued in denominations of Rs.5 lakh or multiples thereof. A single investor should not invest not less that Rs. 5 lakh of face value.
- All eligible participants have to obtain the credit rating from either the Credit Rating Information Services of India Ltd. (CRISIL) or the Investment Information and Credit Rating Agency of India Ltd. (ICRA) or the Credit Analysis and Research Ltd. (CARE) or the FITCH Ratings India Pvt. Ltd., or

any such other credit rating agencies as may be specified by the Reserve Bank of India for issuance of Commercial Paper. The minimum credit rating should be P-2 of CRISIL or such equivalent rating by other agencies. The issuers shall ensure at the time of issuance of CP that the rating obtained is current and has not fallen due for review.

- A corporate would be eligible to issue CP provided
  i. its tangible net worth of the company is not less than Rs.4 crore as per the latest audited balance sheet.
  ii. company has been sanctioned working capital limit by bank/s or all-India financial institution(s); and
  iii. the borrowed account of the company is classified as a standard asset by the financing bank(s)/institutions.
- Financial institution can issue CP within the overall umbrella limit fixed by the RBI, i.e., issue of CP together with other instruments, viz., term money borrowings, term deposits, certificates of deposit and inter-corporate deposits should not exceed 100 percent of its net owned funds, as per the latest audited balance sheet.
- The total amount of CP to be issued should be raised with in a period of two weeks from the date on which the issuer opens the issue for subscription. The amount of CP to be issued should be raised on a single date or in parts on different dates. In case of issuing in parts on different dates, each CP so issued will have the same maturity date.
- Every issuer must appoint an issuing and paying agent (IPA) for issuance of CP and only scheduled bank can act as an IPA for issuance of CP. On maturity of CP, the holder of CP shall present the instrument for payment to the issuer through the IPA. However, when CP is held in demat form, the holder of CP will have to get it redeemed through the depository and receive payment from the IPA. IPA monitor defaults in redemption of CP. Scheduled banks which act as IPA have to report to RBI in case of such occurrence giving full particulars of default of repayment of CPs.
- Both issuers and subscribers to issue/hold CP in dematerialized or physical form, however with effect from June 2001, banks, FIs and PDs are required to issue and hold CP in dematerialized form only. With effect from July 2005 CP can also be issued in dematerialized form through any of the depositories approved by and registered with SEBI. No issuer shall have the issue of CP underwritten or co-accepted.

Issue Expenses

Issue of commercial paper is subject to payment for stamp duty. The stamp duty on a primary issue of CP is 0.25 percent for all other investors, with a concession rate of 0.05 percent for banks. Secondary market transactions do not attract any stamp duty. All the expenses related to the issue of CPs are borne by the issuers.

Taxation

For the Corporate: The discount is treated as an interest expense, deductible for tax purpose.

For the Investor: *Profit/Loss on sale of Investment:* Income is taxed under the head "Profits and Losses from Business and Profession". Losses are allowed as business losses for banks and investment companies. For corporates, that invest in other company CPs, this would amount to Other Income/Interest Income.

In order to improve the secondary debt market conditions in the country, RBI has permitted the Primary Dealers (PDs) to raise funds for their operations by issuing CPs. This may in turn enable the PDs to access greater volumes of funds which would enhance the level of activity in the money market.

CERTIFICATES OF DEPOSITS (CD)

Certificates of Deposits (CDs) were introduced in India in 1989 based on the Vaghul Committee recommendations. The introduction of CDs further widened the money market instruments giving the investor a greater flexibility to deploy short-term surplus funds. Certificates of Deposits are lowest risk category investment option and stands next to T-bills.

Definition

Certificates of Deposits (CD) is a negotiable promissory note, secure and short term in nature. CD are issued at a discount to the face value, the discount rate being negotiated between the issuer and the investor.

Scheduled commercial banks, selected all India financial institutions are permitted by RBI to issue CDs for raising short-term resources. Regional Rural Banks (RRBs) and Local Area Banks (LABs) are excluded from issuing CDs. While banks have freedom to issue CDs depending on their requirement, FIs are allowed to issue CDs within the overall umbrella limit as fixed by the RBI from time to time. As per the RBI guidelines the issued CDs together with other instruments like term money, term deposits, commercial papers and inter-corporate deposits should not exceed 100 percent of its Net Owned Fund (NOF). The NOF is considered as per the latest audited balance sheet.

The minimum amount of a CD an investor can subscribe is should not be less than Rs.1 lakh and should be multiple of Rs.1 lakh thereafter. CDs can be issued to individuals, corporations, companies, trust, funds, etc. NRI can also subscribe to CDs, but on non-repatriable basis, that should be clearly stated on the certificate and cannot be endorsed to another NRI in the secondary market.

CDs may be issued at a discount on face value with the issuing bank/FI having the freedom to to determine the discount/coupon rate. Banks/FIs are also allowed to issue CDs on floating rate basis.

The maturity period of CD issued by banks should be not be less than 7 days and not more than one year. The FIs can issue for a period not less than 1 year and not more than three years from the date of issue.

CDs are issued only in the dematerialized form. However, according to the Depositories Act, 1996, investors have the option to seek certificate in physical form. If investor insists on physical certificate, the issuer should approach to RBI. The issuance of CDs will attract stamp duty. Physical CDs are freely transferable by endorsement and delivery while dematted CDs are transferred as other demat securities. There is no lock-in period for the CDs.

Table 1: Issue of Certificates of Deposits by Scheduled Commercial Banks

(Amount in Rupees crore)

Fortnight ended	Total Outstanding	Rate of Discount (Percent)@	Fortnight ended	Total Outstanding	Rate of ended	Total Outstanding	Total Outstanding	Rate of Discount (Percent) @
1	2	3	4	5	6	7	8	9
2003			2004			2005		
January 10	1,199	4.37-6.61	January 9	4,457	3.87-6.00	January 7	7,033	3.91-6.26
24	1,226	4.60-7.00	23	4,419	3.57-6.11	21	4,236	4.01-6.25
February 7	1,214	4.75-6.50	February 6	4,826	3.92-5.06	February 4	8,202	4.50-6,32
21	1,125	3.00-7.10	20	4,656	3,75-6.00	18	9,214	4,25-6.12
March 7	928	5.25-7.10	March 5	4,831	3.59-5.75	March 4	10,310	5.25-6.31
21	908	5.00-7.10	19	4,461	3.87-5.16	18	12,078	4.21-6.34
April 4	891	5.25-7.40	April 2	4,626	3.75-5.16	April 1	14,975	4,75-6.60
18	1,485	5.25-7.40	16	4,613	4.64-6.00	15	14,106	4.10-5.60
May 2	1,660	5.00-6.26	30	4,725	3.50-4.45	29	16,602	4.10-6.60
16	1,946	5.25-6.25	May 14	4,703	4.08-4.61	May 13	17,420	4.24-6.650
30	1,996	3.94-7.00	28	4,860	1.09-4.73	27	17,689	4.29-6.75
June 13	2,227	3.99-7.00	June 11	5,065	4.70-5.00	June 10	18,503	5.47-7.00
27	2,183	3.74-6.50	25	5,438	3.96-6.75	24	19.270	5.58-7.50

(Amount in Rupees crore)

Fortnight ended	Total Outstanding	Rate of Discount (Percent)@	Fortnight ended	Total Outstanding	Rate of ended	Total Outstanding	Total Outstanding	Rate of Discount (Percent) @
1	2	3	4	5	6	7	8	9
2003			2004			2005		
July 11	2,242	4.45-6.25	July 9	5,529	4.14-6.75	July 8	20.509	4.50-7.00
25	2,466	5.25-6.75	23	5,478	4.02-6.75			
August 8	2,741	4.25-6.75	August 6	4,605	4.30-6.75			
22	2,961	4.75-5.68	20	4,480	4.50-5.00			
September 5	3,024	4.50-5.61	September 3	4,842	4.50-5.75			
19	3,098	4.25-6.00	17	5,112	4.09-5.09			
October 3	3,154	3.75-6.75	October 1	5,164	3.50-5.50			
17	3,243	4.50-7.00	15	4,837	4.00-5.75			
31	3,321	4.25-6.50	29	4,785	4.50-6.26			
November 14	3,511	4.50-7.00	November 12	5,425	3.90-7.00			
28	3,666	3.75-6.10	26	6,118	4.45-6.00			
December 12	3,643	4.00-6.00	December 10	7.121	4.19-6.20			
26	3,830	3.75-6.00	24	6,103	3.96-6.75			

@: Effective discount rate range per annum.

Source: RBI Annual Report 2004-05.

Money Market Mutual Funds (MMMFs)

The benefits of developments in the various instruments in the money market like call money loans, treasury bills, commercial papers and certificate of deposits were available only to the few institutional participants in the market. The main reason for this was that huge amounts were required to be invested in these instruments, the minimum being Rs.10 lakh, which was beyond the means of individual investors. MMMFs were set up to make available the benefits of investing in money markets to small investors.

MMMFs are mutual funds that invest primarily in money market instruments of very high quality and of very short maturities. MMMFs can be set up by commercial banks, RBI and public financial institutions either directly or through their existing mutual fund subsidiaries. The guidelines with respect to mobilization of funds by MMMFs provide that only individuals are allowed to invest in such funds.

Earlier these funds that were regulated by the RBI. But RBI withdrew its guidelines, with effect from March 7, 2000 and now they are governed by SEBI.

The schemes offered by MMMFs can either be open-ended or close-ended. In case of open-ended schemes, the units are available for purchase on a continuous basis and the MMMF would be willing to repurchase the units. A close-ended scheme is available for subscription for a limited period and is redeemed at maturity.

The guidelines on MMMFs specify a minimum lock-in period of 15 days during which the investor cannot redeem his investment. The guidelines also stipulate the minimum size of the MMMF to be Rs.50 crore and this should not exceed 2% of the aggregate deposits of the latest accounting year in the case of banks and 2% of the long-term domestic borrowings in the case of public financial institutions.

INTRODUCTION TO CAPITAL MARKETS

The capital market provides the resources needed by medium and large-scale industries for investment purposes while the money market provides resources for working capital needs. As such while money market deals in short-term sources of funds, (maturity period of which is less than 1 year) capital market deals in long-term sources of funds (with more than 1 year maturity).

Thus, the capital market functions as an institutional mechanism to channel long-term funds from those who save, to those who need them for productive purposes. It serves as a medium to bring together entrepreneurs, initiating activity involving huge financial resources and savers, individuals or institutions, seeking outlets for investment.

Structure of the Capital Market

The structure of the Capital Market is shown below:

The capital market consists of the primary markets and the secondary markets and there is a close link between them. The primary market creates long-term instruments through which corporate entities borrow from the capital market. But secondary market is the one which provides liquidity and marketability to these instruments. These markets interact. If the secondary market is active and buoyant it enables the corporate entities to enter the new issue market or the primary market and raise funds. The depth of the secondary market depends upon the activities of the primary market because it is only when more corporate entities enter into the market and raise funds through the market that more instruments are available in the secondary market for the purpose of improved activities in this market.

Primary Market

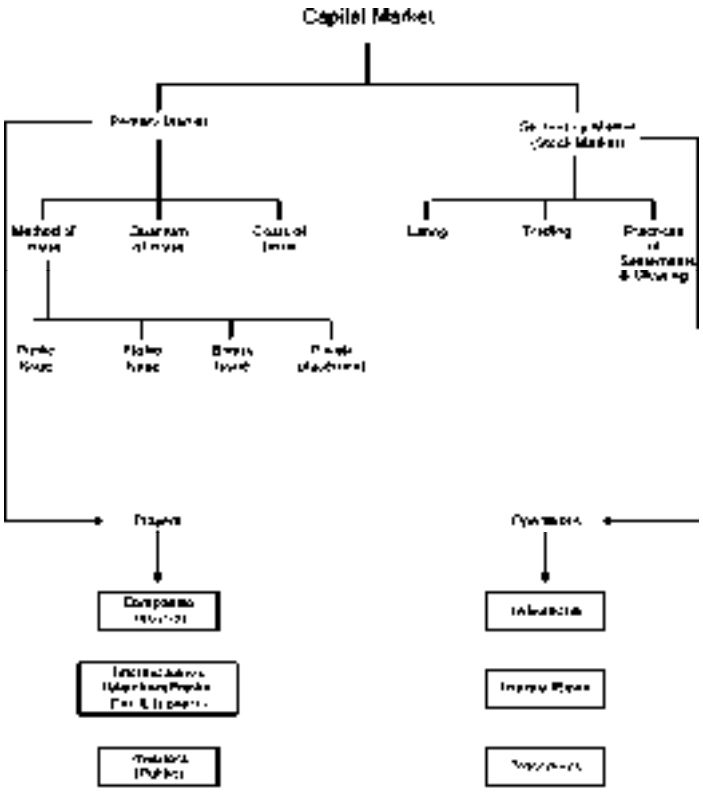
To meet the financial requirements of their projects companies raises capital through issue of securities (shares and debentures) in the primary market.

Capital issues of the companies were controlled by the Capital Issue Control Act, 1947. Pricing of the issues was determined by the Controller of Capital Issues. The main purpose of control on capital issue was to prevent the diversion of investible resources to non-essential projects. Though the necessity of retaining some sort of control on issue of capital to meet the above purpose still exists, the CCI was abolished in 1992 as the practice of Government control over capital issues as well as overpricing of issues has lost its relevance in the changed circumstances.

SEBI

The CCI Controls on Issue of Capital by the companies have been substituted by the transparent and simplified guidelines issued by the Securities Exchange Board of India under the SEBI Act, 1992.

Figure 2.2



Functions and Powers of SEBI

The ever expanding investors population led to a horde of malpractices on the part of the companies, brokers, merchant bankers, investment consultants and various other agencies involved in new issues. This led to an erosion of investor confidence and multiplied their grievances. The government and the stock exchanges were helpless because the existing legal framework was just not enough. Realizing this, SEBI was constituted by the government in April 1988, and given legal status in 1992, as a supervisory body to regulate and promote the securities market to:

- Promote fair dealings by the issuers of securities and ensure a market place where funds can be raised at a relatively low cost.
- Provide a degree of protection to the investors and safeguard their rights and interests so that there is a steady flow of savings into the market.
- Regulate and develop a code of conduct and fair practices by intermediaries in the capital market like brokers and merchant banks to make them competitive and professional.

To carry out its functions SEBI has been given various powers which were previously vested with the Central government. These include

- Power to call for periodical returns from Stock Exchanges. Subject to the fulfillment of certain criteria.
- Power to call upon the Stock Exchange or any member of the exchange to furnish relevant information.
- Power to appoint any person to make inquiries into the affairs of the Stock Exchange.
- Power to amend bye-laws of Stock Exchange.
- Power to compel a public company to list its shares in any Stock Exchange.

Guidelines as per SEBI and Companies Act

SEBI has issued elaborate guidelines on matters relating to public issues, rights issues, bonus issues, issue of debentures, underwriting, private placement, pricing of issues, etc. These guidelines virtually effect all activities relating to capital issues. Under the new guidelines, no prior approval of SEBI is required by the companies for raising capital through public issues, rights issues, in the capital market, subject to the fulfillment of certain criteria.

A company, while raising its capital through issues in the capital market must give due regard to the Guidelines and clarifications issued by SEBI and the provisions of the Companies Act, 1956.

As far as the Companies Act, 1956 is concerned, capital issued by a company should comply with the provisions relating to prospectus, allotment, issue of shares at premium/discount, further issue of capital, etc.

As per the Companies Act, all application forms for shares or debentures should be accompanied by a memorandum containing salient features of a prospectus like general information of the company, terms and particulars of the issue, company's management, risk factors as perceived by the management, etc. which may possibly have a bearing on the assessment of the soundness of the proposition of the company in connection with which the public issue is offered.

In February, 1993 there had been a case against public issue of Skypak Couriers Ltd. regarding the above point. The company had omitted to mention in its memorandum accompanying the application, a Rs.26 crore claim against it by TNT International Ltd., and a winding-up petition in that connection was pending in the Mumbai High Court. It was held that the prospectus of the company should have mentioned the above fact and asked the company to return the application money if any investor demands so, before the allotment was completed.

Under the SEBI guidelines, companies are allowed to issue capital provided the issues are in conformity with the published guidelines relating to disclosure and other matters relating to investors' protection.

Types of Issue[1]

A company can raise its capital through issue of shares and debentures by means of

- Public issue
- Rights issue
- Bonus issue
- Private placement and
- Bought-out Deal.

PUBLIC ISSUE

Public issue is the most popular method of raising capital and involves raising of funds direct from the public.

RIGHTS ISSUE

Rights issue is the method of raising additional finance from existing members by offering securities (shares and debentures) to them on pro rata basis.

A company proposing to issue securities on rights basis should send a 'letter of offer' to the shareholders giving adequate disclosure as to how the additional amount received by the issue is used by the company.

BONUS ISSUE

Some companies distribute profits to existing shareholders by way of fully paid bonus shares in lieu of dividend. Bonus shares are issued in the ratio of existing shares held. The shareholders do not have to make any additional payment for these shares.

PRIVATE PLACEMENT

Private Placement Market (PPM) financing is the direct sale by a public limited company or private limited company, of private as well as public sector, of its securities (shares and debentures) to a limited number of sophisticated investors like UTI, LIC, GIC, State Finance Corporations and Pension and Insurance Funds. The intermediaries are credit rating agencies and trustees (example, ICICI) and financial advisors such as merchant bankers.

Private companies that do not wish to disclose information to the public seek this type of market. Public limited companies too small to finance public issue, as it is costly due to various statutory and non-statutory expenses, can resort to this type of market. And the maximum time-frame required for private placement market is only 2 to 3 months. Private Placement can be made out of promoter's quota but it cannot be made with unrelated investors.

BOUGHT-OUT DEALS

A small project costing around Rs.5-6 crores of rupees finds it costly to go in for a public issue which would eat up 20% of project funds. Bought-out Deals come to the rescue of the promoters of such a project.

What exactly is a Bought-out Deal (BOD)? In its simplest form, a company initially places its equity shares, which are to be offered to the public at a later date, to a sponsor/merchant banker, who in turn offloads the shares at the appropriate time. In a direct offer the merchant banker (or sponsor) is a conduit through whom a company routes shares to the public whereas in a BOD, the sponsor is also an intermediate investor who buys stakes in the company and disinvests in favor of the public at an appropriate time.

Bought-out deals which are known as Angels in UK and elsewhere have made a quiet entry into the Indian corporate world with the Co-nick Alloys' (India) 'offer for sale' at a premium sponsored by Industrial Credit and Investment Corporation of India Limited. In a BOD, the shares are generally offloaded through the mechanism of the Over the Counter Exchange of India (OTCEI) or a recognized stock exchange.

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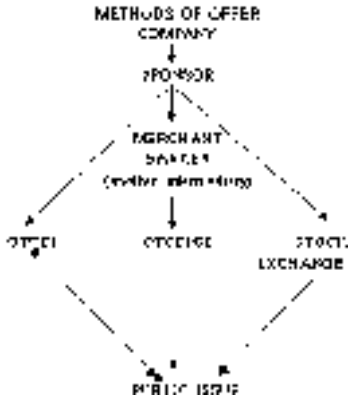
1 The various types of shares and debentures have been discussed in detail in the lesson on Sources of Long-Term Finance

Generally, the sponsors prefer the OTCEI route because of the following reasons:

- If the equity of the company is less than Rs.3 crore, the minimum required to be listed on a stock exchange.

Figure 2.3: Bought-out-Deal



- OTCEI mechanism ensures a total fair play because the bought-out agreement between the sponsor and the company has to be registered with the OTCEI. In case of any default by the sponsor, the matter is referred to an arbitration committee set up by the OTCEI and in case any member fails to abide, the arbitration award can even be expelled by the OTCEI Committee.
- At the OTCEI, offloading of shares by a sponsor is subject to certain conditions.
- The promoters' post-issue holding will be at least 25 percent, with a 5-year lock-in period.
- The sponsor agrees to act as a market maker for the company's shares for 18 months and also identifies an additional market maker for such compulsory market making. These two market makers must, between themselves hold up to 5 percent of the equity offered to the public.
  - If the sponsor offers two way quotes, based on the minimum and maximum trading prices, the difference between the buy and sell quote will be the jobbing profit for the sponsor.
- If the sponsor opts the stock exchange route, his responsibilities are over as soon as he offloads his stake on the stock exchange and there is an element of fear to the company as the sponsor may offload the shares to another intermediary who may be the rival group of the company concerned.

Box 1: BOD Stories
• For Maxwell Apparel, a BOD was put together with ICICI as the sponsor and Times Guaranty as the co-sponsor. Under this deal, total number of shares allotted to the sponsors were 5.3 lakh shares at a premium of Rs.55 each, which subsequently were offloaded to the public through OTCEI at a premium of Rs.65, gaining Rs.10 a share in the process.
• Reliance Capital and Finance Trust (RCFT) acquired one lakh shares of Nielcon Limited at a premium of Rs.20. The shares were later offered to the public over the OTCEI at a higher price of Rs.38.
• Siris Limited's 17.5 lakh equity shares were offloaded by the sponsors, Videocon Leasing and Industrial Finance Limited and Videocon Appliances Limited, at Rs.200. The shares were offered to the Indian public at Rs.265 thus making a profit of Rs.13.12 crore.
• At times, merchant bankers do burn their fingers badly when they wish to offload shares for which there exists no market. One such case was of Growel Times where the lead sponsor, 20th Century Finance Corporation along with the co-sponsors had to take three and half lakh equity shares out of 5 lakh shares acquired by them due to undersubscription.

Advantages

- Promoters are assured of immediate funds.
- Companies can avoid the time-consuming and costly public issue.
- Easier to convince a wholesale investor rather than the general public about the merits of a project.
- Cheapest and quickest source of finance for small to medium-sized companies.

Disadvantage

- Misuse of power by the sponsor.

Secondary Market

The secondary market is that segment of the capital market where the outstanding securities (securities already issued) are traded. From the investors' point of view the secondary market imparts liquidity to the long-term securities held by them by providing an auction market for these securities.

The secondary market operates through the medium of stock exchanges which regulates the trading activities in this market and ensures a measure of safety and fair dealing to the investors.

India has a long tradition of trading in securities going back to nearly 200 years. The first Indian stock exchange established at Mumbai in 1875 is the oldest exchange in Asia. The main objective was to protect the character, status and interests of the native share and stock brokers.

PERSONS AT STOCK EXCHANGE

The stock exchange is an auction market in shares and other securities and is mainly characterized by a bull and a bear. A bull is the buyer in the market. He always takes an optimistic view of the market.

A bear on the other hand is the seller. He is basically a pessimist and always considers that the things have reached its peak. He believes in selling at the sight of minimum of profits. He sometimes sells even without owning the shares. This maneuver is referred to as a short sale.

THE ORDER

The orders can be classified into:

- *Limit Orders:* Order limited by a fixed price. It may or may not include brokerage.
- *Best Rate Order:* To execute the buy/sell order at the best possible price.
- *Immediate or Cancel Order:* Order shall get canceled if not executed immediately at the quoted price.
- *Limited Discretionary Order:* To provide discretion to the broker to execute order at a price which is almost approximate to the price fixed by client.
- *Stop Loss Order:* A particular limit is given for sustenance of loss. If the price falls below that, the broker is authorized to sell immediately to stop further occurrence of losses.
- *Open Order:* When client does not fix any time or price limit for execution of order.

Execution of Order

Order is normally executed on any of the trading days. After the setting up of electronic trading, the orders are executed by the quotes available on the screen.

NATIONAL STOCK EXCHANGE

The National Stock Exchange is India's latest bourse.

Like the OTCEI it is computerized. However, it is not confined to scattered pockets and has a national reach through satellite linkage.

Like the BSE only members conduct transactions but professionals who do not have a stake in the system run it.

The idea of forming NSE was conceived by the late Mr. M J Pherwani who was then the Chairman of National Housing Bank.

The trading on NSE commenced with debt instruments from June 30, 1994.

The NSE launched its equity market segment on the 3rd of November, 1994. The trade was for 100 shares of Reliance. On this day during the three hour session 1,498 trades were executed in 200 securities with value being put at Rs.9 crore.

The main objectives of the NSE are to provide speedy transactions, fast settlements and to benefit the small investor who often finds it difficult to sell shares at BSE.

TRADING SYSTEM

Trading on all stock exchanges was being carried out by "public outcry" in the trading ring. This was an inefficient system and also resulted in lack of transparency in trade. The Over The Counter Exchange of India (OTCEI) was the first exchange to introduce screen based trading in India. Listing on OTCEI was restricted to small and midcap companies. Screen based trading received a big boost with the setting up of the National Stock Exchange. NSE provided nationwide access to investors by setting up trading terminals all over the country. These terminals were networked through satellite links.

Ever since the decade of eighties there has been an unprecedented growth of the stock markets. The number of stock exchanges in the country have increased from 8 in 1980 to 24 in 1993. The number of listed companies have increased to 10,000 by 2005. The present stock exchanges have a much wider role to play wherein protection of the investors' interests becomes the paramount concern.

The stock market in India is regulated by the Central Government under the Securities Contracts (Regulation) Act, 1956. Under this Act, the Government has the powers to supervise and control the stock exchanges and also keep a check on the governing body and supersede it if any irregularities are found to have been committed.

The stock market is a pivotal institution in the financial system. A well-ordered stock market performs several economic functions like translating short-term and medium-term investments into long-term funds for companies, directing the flow of capital in the most profitable channels, etc.

To give a boost to stock market the government had announced certain favorable policy measures like

i. Establishing SEBI.

ii. Taking steps to encourage foreign investment in securities market.

iii. Starting electronic linkage of 5 large stock exchanges.

iv. Giving recognition to more stock exchanges.

v. Establishment of Over the Counter Exchange of India (OTCEI).

vi. Allowing investments by Foreign Institutional Investors (FIIs).

Until the entry of the FIIs, the domestic financial institutions were the major players in the market along with some wealthy individuals and investment institutions (mutual funds). Though small investors also participated in the market very actively until the scam, they have deserted the market since then. The FIIs, with their vast resources, are now among the biggest players in the market and the government has been taking measures from time to time to encourage them to bring in foreign capital. This helps to perk up the secondary market. The FIIs,

however, are subject to certain regulations made by the SEBI and also some other statutes:

- FIIs would be required to obtain an initial registration with SEBI before investment. Along with the application to SEBI, FIIs would also be required to file an application addressed to RBI for obtaining various permissions under the Foreign Exchange Regulation Act, 1973.
- Portfolio investments in primary or secondary markets will be subject to a ceiling of 30 percent of issued share capital for the total holdings of all FIIs in any one company. Similarly, the holding of single FII in any company should not exceed 10 percent of total issued share capital.
- SEBI shall take into account the track record of the FII, its other criteria that are relevant for granting registration.
- There is no restriction on the amount of investment and no lock-in period.
- They are required to allocate their total investment in the ratio of 70:30 between equities and debentures.
- FIIs cannot engage in short sales.
- Short-term capital gains arising out of transfer of securities are taxed at 30%, and interest and dividend at 20%.
- Disinvestment should be through stock exchanges in India, through a custodian (approved by SEBI).

The fully automated trading system enabled market participants to login orders, execute deals and receive online market information. The competition from NSE forced the regional stock exchanges including BSE to switch over to screen based trading. The NSE trading system is order driven while the OTCEI system is quote driven. In an order driven environment, the system captures all the orders and matches them with each other to execute the transaction. A quote driven system is based on the market making concept (dealer giving two way quotes) and the order logged in is matched against the best quote given by the market maker. BSE Online Trading (BOLT) is a mixture of both quote driven and order driven system as the system permits both jobbing and direct matching of orders.

DEPOSITORS

One of the major drawbacks of Indian capital market was that securities were held in the form of certificates. This led to problems in physical storage and transfer of securities. There was also the risk of bad delivery for the buyer. The transaction costs were also higher due to physical movement of paper and the incidence of stamp duty. National Securities Depository Ltd. (NSDL) was set up in 1996 as India's first depository. A depository is an entity, which holds the securities in electronic form on behalf of the investor. This is done through dematerialization of holdings at the request of the investor. Dematerialization is a process by which physical certificates of the investor are destroyed and an equivalent number of securities are credited to his account. This also enables transfer of securities by book entries. The risk of bad deliveries is also eliminated. The transaction costs are also reduced due to less flow of paper and transfer of securities through depository does not attract stamp duty. Further the depository also handles all the corporate actions like exercising for rights, collection of dividends, credit for bonus, exercising of warrants, conversion option, etc., on behalf of the investor. SEBI has made it mandatory for institutional.

CLEARING MECHANISM

The clearinghouses attached to the stock exchanges functioned only as conduits to delivery of securities and money. The default risk by the counterparty in the transaction continued to remain. The NSE was the first stock exchange to set up a

clearing corporation. The National Securities Clearing Corporation (NSCC) assumes the counterparty risk in all trading deals made on the exchange.

NSCC acts as the counterparty for all the trades and the default risk in the deal is borne by it. NSE has created a special Trade Guarantee Fund for this purpose and loss due to default will be met from its corpus.

CARRY FORWARD SYSTEM

Earlier, the Indian Stock Exchanges had been an amalgam of cash market and forward market. The prices of the scrips on the exchange did not reflect their 'true' price in the underlying cash market. Further there was indiscriminate and rampant speculation in the market. Defaults were common and other members were forced to "accommodate" the defaulting member. Often, the defaults had a snowballing effect and the entire market would be in the throes of a major payment crisis. This frequently resulted in the closure of the exchanges for a few days. In order to curb the prevailing malpractices, SEBI banned carry forward transactions on all stock exchanges in 1993. Later based on the recommendation of the committee chaired by G S Patel, which worked out the modalities to re-introduce the system, a modified carry forward system was introduced. The badla procedure was also streamlined. Again the system of carry forward of positions was banned from July 2, 2001. In order to give the market adequate time to orderly unwind the positions, the board recommended a transitional mechanism. As per the mechanism, all outstanding deferred positions in the current settlement shall be compulsorily liquidated by September 3. The board also approved introduction of options on individual scrips from July 2. Introduction of other derivative products to introduce the rolling settlement in the additional 251 scrips from July 2 was reiterated, thereby bringing the total number of scrips to 441. Further it was decided that all scrips listed on all the stock exchanges should be traded only under rolling settlement mode, with effect from January 2, 2002 and no scrip shall be traded on weekly settlement basis.

Box 2: Advantage Rolling

The rolling settlement has many virtues. One, it reduces speculation and arbitrage in scrips as settlement occurs on a daily basis. Thus, there would be increase in delivery-based transactions reducing the speculation currently existing by way of carry forward of position in various scrips. Apart from this, shifting position from one stock exchange to another will reduce which, in turn, will eliminate arbitrage opportunities in scrips. Two, it reduces pricing glitches and manipulation and explores a better price discovery process. With the rolling settlement in place, all open positions at the end of each day would come up for delivery thereby improving the quality of cash market transactions. Thus, price formation process on daily basis would be improved thereby resulting in improved price discovery process. Three, it reduces end of settlement period pressure as shares are delivered and cash is paid everyday instead of a week. Thus, the rolling settlement spreads the delivery and payment throughout the week. Four, it narrows the bid-ask spreads, reduces the settlement risk and eliminates the need to synchronize the settlement dates on NSE and BSE or for that matter across the exchanges. And, of course, with the implementation of a Rolling Settlement investors will be benefited, as settlement will not take long and the prices an investor pays or receives will be closer to the market price. Securities and money will be transmutable.

Settlement System at present Indian Stock Exchanges are working on T+2 rolling settlement system. Under T + 2 rolling settlement system all trades executed on a day are netted and only net obligation are to be settled by way of delivery or payment. In case of sale of shares the seller is required to give the delivery by 6 pm in electronic from and by 4 pm in physical form on T + 1 day to the depository participant. The DPs execute pay-in instruction by 10.30 A.M. on T+2. The

depository transfers the securities to the clearing house/exchange/clearing corporation by 11 AM on T + 2 day. The clearing house/exchange/clearing corporation execute the pay-out of securities and funds latest by 1.30 P.M on T+2 to the depositories and clearing banks and the depositories and the clearing banks in turn complete the process by 2.00 P.M on T + 2.

THE SETTLEMENT PROCEDURE AT NSE

The NSE has a computerized trading mechanism. The mechanism is hooked nationwide via satellite to increase the scope and depth of the market.

The automated environment moreover ensures that all the orders floating in the system whether they are best buy or best sell quotes are available on the system.

Each trading member of NSE has a computer located in his office wherever that may be in India. The computer is connected to the central computer system at NSE, by a satellite link using VSAT (Very Small Aperture Terminals). During the trading time, the member can go on entering the buy or sell orders with the best price and the time-frame within which he wants his orders to be executed.

The computer will bear the various orders and within 30 seconds the transaction is executed and the unmatched orders are stored in the memory and executed when they are matched. Thus the role of jobbers is eliminated.

The trading time on NSE is from 9.55 a.m to 3.30 p.m.

NSE trading system allows flexibility while placing an order, allowing brokers to place limits on price or on the order or even on the time-frame. The trading member can break large lots into smaller lots or cancel the outstanding orders in one go.

The computer sorts out orders on the basis of price-time priority i.e., sorts out orders as and when they are received in terms of the price of each security and the time entered.

PROTECTION OF IDENTITY OF THE INVESTOR

Till the transaction is executed the identity of brokers is not disclosed. As the participants' identity is protected the trading member can even enter high volume transaction.

SETTLEMENTS

The settlement for debt is to take place via a book entry transfer in a depository. The book entry transfer system is to operate similar to a bank passbook. The accounts would be maintained against each member, detailing securities held in the members name.

THE CENTRAL DEPOSITORY

In the Central Depository the funds and securities position would be debited/credited through electronic book entry transfers which are expected to speed up payments. Each member is to have a passbook account in the depository where the securities deposited in the members' name is recorded, by electronic book entry transfer.

At the end of each day's transaction the computer generates a report of matched transactions and the net positions of each trading member.

GOVERNMENT SECURITIES MARKET

Types of Government Securities

The term government securities encompasses all bonds and treasury bills issued by the Central Government, State Governments, and other entities like corporations, municipal authorities and companies wholly owned by the government for the purpose of raising funds from the public. These securities are usually referred to as

'gilt-edged' securities as repayments of principal as well as interest are totally secured, being the first charge on the nation's purse. Hence, the Central Government securities are considered as safest claims.

The government securities have been issued with maturities ranging from 3 to 31 years since independence. In early '90s the average maturity period was shortened to 10 years by RBI. They can be classified into three categories depending upon their maturities viz., long-dated, medium-dated and short-dated. Long-dated securities have maturities exceeding 10 years from the issue date, medium-dated securities have maturities ranging from 5 to 10 years and short-dated securities are those which mature within 5 years.

Depending upon the issuing body, such securities could be bifurcated into five types viz.,

- Central Government securities.
- State Government securities.
- Securities guaranteed by Central Government for All India Financial Institutions like IDBI, ICICI, IFCI, etc.
- Securities guaranteed by State Government for state institutions like state electricity boards and housing boards.
- Treasury bills issued by RBI.

Government securities could be held in three forms viz.,

i. Stock Certificates

ii. Promissory Notes

iii. Bearer Bonds.

STOCK CERTIFICATES

When public debt is issued in the form of stock, the owner gets a certificate specifying that he is a registered holder in the book of the Public Debt Office (PDO). The Certificate indicates the interest rate, interest due dates and face value of the stock. A stock certificate is not transferable by endorsement. Transfer can take place only by means of a transfer deed upon the execution of which the transferee's name is substituted in the place of the transferor in the books of the PDO. Such transfer deed requires no stamp duty. A stock certificate is thus completely secure against loss by fire, theft, etc. and the title of the holder is not exposed to the risks which are attached to holdings in negotiable securities. Interest payments are through interest warrants issued by the PDO to the domicile of the holder or a specified local office of the RBI or any branch of the agent bank conducting government securities business in India. Repayments of principal is also carried out in a similar fashion. Stocks could also be held in the form of a ledger account opened by the PDO in the name of the holder in the subsidiary ledger. Such a facility is restricted by PDO to banks, institutions and mutual funds whose total holding justify opening of such an account.

PROMISSORY NOTES

Promissory Notes contain a promise by the President of India, or the Governor of the State for payment to the holder the consideration along with interest. These are negotiable instruments payable to the order of specified persons and transferable by endorsement made in the boxes printed on the reverse of the notes.

BEARER BONDS

Bearer bonds certify the bearer for entitlement to the specified sum along with interest payable by interest warrants attached along with the bonds. Such bonds are transferable by mere physical delivery.

OTHERS

Normally in the money market, government securities are held in the form of stock certificates. Besides these principal forms of government securities, there are other types of securities which are floated by the government from time to time. They are:

i. Treasury Bills

ii. National Defense/National Savings/National Deposit Certificates

iii. Deposit Certificates

iv. Annuity Certificates

v. Annuity Deposit Certificates

vi. Zamindari Abolition Compensation Bonds and Rehabilitation GrantBonds

vii. Social Security Certificates

viii. Capital Investment Certificates.

Market for Government Securities

PRIMARY MARKET

Reserve Bank of India is given the task of managing the public debt in the economy. It therefore regulates the issues by various issuing bodies since all of them have to tap the same market. It considers aspects such as –

Quantum of Issue

The government of India declares its quantum of borrowing in its budget statement. They are issued by the RBI on behalf of GOI to finance the governments deficit and public sector development programs.

Timing of Issue

Auctions are usually timed during periods of high liquidity to raise the maximum amount at the best price. The budgeted amount of issues in a given year are raised through a number of tranches that year to avoid flooding of securities in the market at one time. The timing factor takes into account issues such as prevention of issues during food procurement operations and the need of the issuing bodies for their programs. RBI takes care to see that the issue gets fully subscribed failing which it has to take the unsubscribed portion in its own account.

Terms of Issue

The terms of issue involve aspects such as coupon and maturity terms and normally the issues adhere to the long-term yield curve drawn by RBI for all government securities.

Procedure of Issue

These securities are issued through the Public Debt Office (PDO) of the RBI. These securities are normally issued through a treasury auction. The participants' bid mentions the amount and the yield. The yield is quoted on a semi-annual basis. One participant can place multiple bids. The allotment is given to the bidders whose yield demands are less than or equal to the cut-off yield decided by the RBI. Partial allotments are made on a pro rata basis for bids at the cut-off or clearing yield. The clearing yield is the coupon rate for that issue. The bids at yields lower than the cut-off, are allotted at a premium to par. All the investors above the cut-off rate are allowed to withdraw money or told to take the issues.

INVESTORS

The major categories of investors in primary markets for government securities are:

i. Commercial banks

ii. Financial institutions (Fls)

iii. Large corporate bodies

iv. Reserve Bank of India

v. Foreign Institutional Investors.

The commercial banks are compulsive investors in government securities due to SLR maintenance with RBI. While nationalized banks prefer long-dated securities which normally have higher interest rates, the foreign banks prefer short-dated securities in order to minimize the depreciation in their investments.

The financial institutions and large corporate bodies prefer long-dated securities as they have large long-term surplus. This also helps them to match their long-term liabilities with such loan maturities. Government securities and bonds are preferred by them as they are totally risk-free.

The Reserve Bank of India is a major investor in government securities. Such investments are by default as RBI takes over the unsubscribed portion of any issue of government loan. It is in fact, a market maker of government securities. Such market making is carried out through RBI's open market operations and switch deals with the sole purpose of managing the issue of government borrowings and to facilitate the commercial banks to maintain their portfolio in such a way that they do not suffer any loss. These operations are discussed below under the section secondary market.

INVESTMENTS IN GOVERNMENT SECURITIES

The FIIs have been permitted to invest in dated securities within the framework of guidelines on debt instruments for 100% debt funds, subject to an annual cap on such investment within the overall limit of external commercial borrowings.

- FIIs are allowed to invest in dated securities of all maturities of both central and state governments and in treasury bills both in primary and secondary markets.
- FIIs are allowed to set-up 100% debt funds.
- Interest earned on debt instruments is taxed at 20%.

SECONDARY MARKET

The secondary market in government securities was a few years back quite narrow and dominated by a few institutions and commercial banks. However, in early '90s the market has turned fairly active with various trading banks and some brokers quoting two-way prices which has imparted liquidity to this money market instrument.

The secondary market for securities is akin to the call market with major business being concentrated done in Mumbai. RBI approved brokers are permitted to transact business in securities with banks, institutions and RBI. Transactions are effected in spot as well as in futures for outright sale/purchase as well as for 'ready forwards'.

Settlement Procedure

- RBI acts as the depository and maintains SGL account for various banks and financial institutions.
- If the investors does not have SGL account, then it needs to open a constituent account with any registered bank authorized by RBI for the purpose.
- Transfer is through book entry method in SGL account maintained at PDO.
- Brokerage is 0.01 percent but is negotiable i.e., it can be taken only from buyer, or seller or from both.

Security deals are carried out on ex-interest basis as per the bye-laws of the various stock exchanges. This has also led to 'voucher trading' in the securities market. The amount of income tax deductible at source on the accrued interest income of government securities is popularly referred to as voucher. Thus, in a

securities transaction, the seller is entitled to receive from the buyer, the quoted price plus interest accrued till date as reduced by the income tax deductible at source on such interest. Such amount deducted on a pro rata basis is retained by the buyer, on the grounds that interest received by him on the due date would be after deduction of income tax. The buyer receives the tax certificate in respect of tax deduction on the interest income which could be set-off against his tax liabilities. The seller on the other hand does not receive such tax benefit as he does not get any Tax Deducted at Source (TDS) certificate. Banks and institutions find it advantageous to purchase securities around interest dates to avail themselves of the voucher benefit and subsequently unload. The RBI, being fully exempt from tax, does not stand to lose as seller. Though voucher trading is not a desirable practice it activates the securities market to a certain extent. The RBI is doing its best to curb voucher trading by fixing switch quotas for banks and brokers, suspending trading in a scrip before the interest due date, etc.

INVESTORS

The major players in the secondary market are, the commercial banks, the financial institutions, the brokers and the RBI. The yields on government securities are low and this prevents many aggressive mutual funds, investors and private corporations to enter this market.

YIELD

The investors investing in these securities gain two types of yields:

Running yield or current yield: It is the return on investment (in the current year only) from the interest income and it is calculated as the ratio of the interest income to the purchase price of the security expressed as a percentage.

YTM or redemption yield: It is calculated as the return on the investment from the discounted cash flows up to redemption.

The coupons are fixed and paid out semi-annually to the holder. The coupons offered on these securities were pre-determined by the Central Bank until 1993 and were kept lower than market interest rates in order to minimize the cost of servicing public debt. From April, 1993, the Reserve Bank has begun auctioning the securities competitively and since then the interest rates have been increasingly set at market determined levels.

Treasury Bills

PURPOSE

Treasury bills are raised to meet the short-term funds required by the Government of India. As the Government's revenue collections are bunched and expenses are dispersed, these bills enable it to manage the cash position in a better way. T-bills also enable the RBI to perform Open Market Operations (OMO) which indirectly regulate money supply in the economy. Investors prefer Treasury bills because of high liquidity, assured returns, no default risk, no capital depreciation and eligibility for statutory requirements.

FORM

T-bills are issued either in the form of a promissory note (or scrip) or credited to investors SGL account. For every class, a standardized format is used.

SIZE

The Treasury bills are issued for a minimum amount of Rs.25,000 and in multiples of 25,000 thereof. T-bills are issued at a discount and are redeemed at par.

Primary Market in India

In India, till April, 1992, T-bills of 182 days maturity were issued along with 91-day T-bills. These have since been phased out in favor of 364-day T-bills. In 1997, in order to enhance the depth of money market in India, the RBI decided to introduce 14-day and 28-day T-bills, along with 91-days, 182-days, 362-days T-bills.

The RBI in its annual monetary and credit policy for the year 2001, with drew 14-days and 182-days T-bills from May 14, 2001. At present, the GOI (Government of India) issues two types of T-bills viz., 91-day and 364-day. These

instruments make a very liquid market especially in the short-term. It is because of their liquidity, they form a significant portion of total turnover in the sovereign paper market.

364-DAY T-BILLS

The money supply in the economy is greatly influenced by the government securities. Hence RBI, through its open market operations controls the money supply through buying and selling of the government securities in the market. The Government considered that a developed government securities market is necessary for monetary control. It also intended to ensure that its credit needs were met more and more directly from the market instead of pre-emption of deposit resources. With this view, the Treasury bill was developed as a monetary instrument with market related rates. As a part of the overall development of Government securities market, the Government of India proposes to float Treasury bills of varying maturities up to 364 days on auction basis. So the Government, with an intention to stabilize the money market in the country, introduced the 364-day T-bills on 28th April, 1992. The RBI neither discounted these bills the nor participated in the auction. 364-day T-bills are auctioned fortnightly, but the amount, however, is not notified in advance. These T-bills have become popular due to their higher yield coupled with liquidity and safety. The yield on 364-day T-bills is used as a benchmark by the financial institutions such as IDBI, ICICI, etc. for determining the rate of interest on floating bonds/notes. They have widened the scope of money market and provided an innovative outlet for surplus funds. The introduction on Treasury bills of varying maturities would offer investors a wider choice for investing in different instruments and thereby foster the development of Government securities market.

182-DAY T-BILLS

Following the Sukhmay Chakravarty Committee recommendations, in November 1986, 182-day T-bills were introduced in order to develop the short-term money market and also to provide an additional avenue for the Government to raise financial resources for its budgetary expenditure. Initially, these were the first type of Treasury bills to be auctioned on monthly basis without any rediscounting from RBI. Thus, the first step of market-oriented discount rate came into existence. The state governments and provident funds were not allowed to participate in these auctions. To impart an element of flexibility, the Central Bank did not announce the amount in advance. The market participants were allowed to bid the amount and price of their choice. The authorities would determine the cut-off discount rate and the amount of T-bills sold in an auction. They were issued with a minimum lot size of Rs.1 lakh and multiples thereof. These auctions were monthly in the beginning but later in 1988, they were made fortnightly. These bills were eligible securities for Statutory Liquidity Ratio purpose and for borrowing under standby refinance facility of the RBI. The 182-day T-bills had an interest rate that was relatively market determined and this made the development of its secondary market possible. Nevertheless, till 1987, 182-day T-bills market could not emerge as an integral part of the money market. These bills were discontinued since May 2001 and replaced with 364-day T-bills.

91-DAY T-BILLS

Starting from July 1965, 91-day T-bills were issued on tap basis with a discount rate ranging from 2.5-4.6 percent per annum. Till July 1974, the discount rate was 4.6 percent. Even later, the discount rate hovered around the same. The extremely low yield on these bills was totally out of alignment with the other interest rates in the system. Moreover, the Central Bank readily rediscounted these bills due to which their yield remained more or less artificial. The banks used these instruments to part their funds for a very short period of 1-2 days. This resulted in violent fluctuations of volumes of outstanding T-bills. The RBI had introduced two measures in order to copy with the situation. Firstly, to recycle the T-bills (from October, 1986) under which the bills are rediscounted by the RBI and then

resold to the banks. Secondly, an additional early rediscounting fee was imposed, if the banks rediscounted the T-bills within 14 days of purchase. Although this resulted in a decline in weekly fluctuations, the T-bills market did not become an integral part of the money market and the interest rates did not rise considerably as the bulk of T-bills continued to be held by the RBI. The weekly auctions of 91-day T-bills were started in January 1993, which in due course resulted in gradual decline of the T-bills outstanding with the RBI. As per monetary and credit policy of April 2001, the 14-day Treasury Bill and 182-day Treasury Bill auctions has been discontinued and instead, the notified amount in the 91-day Treasury Bill auctions has been increased to Rs.500 crore with effect from April, 2004. The notified amount of 364-day Treasury Bills was enhanced from Rs.1,000 crore to Rs.2,000 crore with effect from April 2004.

Secondary Market

CLEARING AND SETTLEMENT

If a seller wants to sell or transfer the security, he has to issue an SGL (Subsidiary General Ledger) transfer form specifying the details of the transaction. The SGL transfer form is then lodged by purchasing the bank with the Public Accounts Department of RBI to credit its account by debiting the value of the securities to the seller's account. Usually, interbank trades are settled on the same business day, whereas trades with non-bank counterparties settle either on the same day or 1 business day after trade date.

T-BILL YIELD CALCULATIONS

The bank calculates yield based on 365-day year. If the face value of the bid is 100, and the bid received by the RBI is Rs.88.24 for a 364-day Treasury Bill, then the yield is calculated as follows:

$$k = \frac{F-P}{P} x \frac{365}{d}$$

Where, k = Yield

F = Face value

P = Price

d = Maturity period in days

$$k = \frac{100-88.24}{88.24} x \frac{365}{364} = 13.36\%$$

Commercial paper, certificates of deposit, short-term debenture and intercorporate lending are alternatives to T-Bills. In spite of the lower returns, T-Bills constitute a viable investment opportunity due to their liquidity, eligibility for SLR, zero risk weightage for the purpose of capital adequacy and minimal requirement of back-office support.

PUBLIC SECTOR UNDERTAKINGS (PSU) BONDS

Nature

PSU bonds are debt instruments issued by various public sector units such as Indian Railway Finance Corporation, Nuclear Power Corporation, Mahanagar Telephone Nigam, Coal India, Power Finance Corporation, etc. These bonds carry seven years maturity and are normally secured against fixed/floating charge on fixed assets, book debts, other current assets, etc. They are similar to non-convertible debentures issued by private sector companies in all respects.

The PSU bonds are normally of two types viz., taxable and tax-free. While the tax-free bonds bear a coupon rate of 9 percent p.a., the taxable bonds carry a coupon rate of 13 percent p.a. With the recent deregulation in interest rate structures, the interest ceiling on taxable bonds has been removed. The tax-free bonds are proposed to be phased out and at present only the Indian Railway Finance Corporation and Housing and Urban Development Corporation are permitted to issue such bonds.

The 9 percent bonds are very popular in the financial market as they carry totally tax-free income under Section 10 of the Income Tax Act, 1961. Units and bonds are ideal choices for a money market fund manager.

While UTI announces sale and repurchase rates for units, bonds are normally privately placed by the issuing corporation with various merchant bankers. The corporation invites bids from all merchant bankers who in turn will offload these bonds to the investors over a period of time.

Other schemes of the Indian Financial System comprising All India Financial Institutions, Investment Institutions, Commercial Banks and Non-Banking Financial Companies will be covered in the coming lessons.

Secondary Market

There is a fairly large market for PSU Bonds. The 13 percent bonds are demanded by institutions like LIC, GIC, UTI for their core investments. Further, such investments come under their 'approved investments' and they have to perforce invest a fixed percentage of their investible surplus in such bonds. The 9 percent bonds are popular with high tax paying multinationals and foreign banks.

The bonds market is pretty similar to units market and has all the features of forward trading, two-way quotes, etc. The market lot for PSU bonds for the purpose of trading is a minimum of Rs.5 crore.

INTERNATIONAL CAPITAL MARKETS

Origin

The genesis of the present international markets can be traced back to 1960s, when there was a real demand for high quality dollar-denominated bonds from wealthy Europeans (and others) who wished to hold their assets outside their home countries or in currencies other than their own. These investors were driven by the twin concerns of avoiding taxes in their home country and protecting themselves against the falling value of domestic currencies. The bonds which were then available for investment were subjected to withholding tax. Further it was also necessary to register the ownership of the bonds. Dollar denominated Euro-bonds were designed to address these concerns. These were issued in bearer forms and so, there was no record of ownership and no tax was withheld.

Also, until 1970, the International Capital Market focused on debt financing and the equity finances were raised by the corporate entities primarily in the domestic markets. This was due to the restrictions on cross-border equity investments prevailing until then in many countries. Investors too preferred to invest in domestic equity issues due to perceived risks implied in foreign equity issues either related to foreign currency exposure or related to apprehensions of restrictions on such investments by the regulators.

Major changes have occurred since the '70s which have witnessed expanding and fluctuating trade volumes and patterns with various blocks experiencing extremes in fortunes in their exports/imports. This was the period which saw the removal of exchange controls by countries like the UK, France and Japan which gave a further boost to financial market operations. In addition to this, the application of new technology to financial services, the institutionalization of savings and the deregulation of markets have played an important role in channelizing the funds from surplus units to deficit units across the globe. The international capital markets also became a major source of external finance for nations with low internal savings. The markets were classified into Euro Markets, American Markets and Other Foreign Markets.

The Players

Borrowers/Issuers, Lenders/Investors and Intermediaries are the major players of the international markets. The role of these players is discussed below.

Borrowers/Issuers

These primarily are corporates, banks, financial institutions, government and quasi-government bodies and supranational organizations, which need forex funds for various reasons. The important reasons for corporate borrowings are, need for foreign currencies for operation in markets abroad, dull/saturated domestic market and expansion of operations into other countries.

Governments borrow in the global financial market to adjust the balance of payments mismatches, to gain net capital investments abroad and to keep a sufficient inventory of foreign currency reserves for contingencies like supporting the domestic currency against speculative pressures.

Lenders/Investors

In case of Euro-loans, the lenders are mainly banks who possess inherent confidence in the credibility of the borrowing corporate or any other entity mentioned above. In case of a GDR it is the institutional investors and high net worth individuals (referred as Belgian Dentists) who subscribe to the equity of the corporates. For an ADR, it is the institutional investor or the individual investor through the Qualified Institutional Buyer who puts in the money in the instrument depending on the statutory status attributed to the ADR as per the statutory requirements of the land.

Intermediaries

Lead Managers

They undertake due diligence and preparation of offer circular, marketing the issues and arrange for road shows.

Underwriters

Underwriters of the issue bear interest rates/market risks moving against them before they place bonds or Depository Receipts. Usually, the lead managers and co-managers act as underwriters for the issue.

Custodian

On behalf of DRs, the custodian holds the underlying shares, and collects rupee dividends on the underlying shares and repatriates the same to the depository in US dollars/foreign equity.

Apart from the above, Agents and Trustees, Listing Agents and Depository Banks also play a role in issuing the securities.

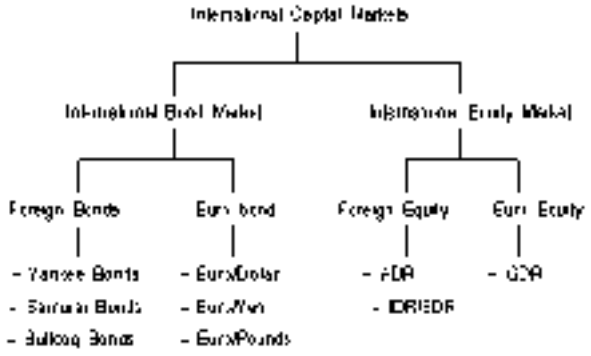
The Instruments

The early eighties witnessed liberalization of many domestic economies and globalization of the same. Issuers from developing countries, where issue of dollar/foreign currency denominated equity shares were not permitted, could access international equity markets through the issue of an intermediate instrument called ‘Depository Receipt’.

A Depository Receipt (DR) is a negotiable certificate issued by a depository bank which represents the beneficial interest in shares issued by a company. These shares are deposited with the local ‘custodian’ appointed by the depository, which issues receipts against the deposit of shares.

The various instruments used to raise funds abroad include: equity, straight debt or hybrid instruments. The following figure shows the classification of international capital markets based on instruments used and market(s) accessed.

Figure 2.4



Equity

GDRs

GDR stands for Global Depository Receipts.

A GDR is a negotiable instrument which represents publicly traded local-currency-equity share. GDR is any instrument in the form of a depository receipt or certificate created by the Overseas Depository Bank outside India and issued to non-resident investors against the issue of ordinary shares or foreign currency convertible bonds of the issuing company. Usually, a typical GDR is denominated in US dollars whereas the underlying shares would be denominated in the local currency of the Issuer. GDRs may be – at the request of the investor – converted into equity shares by cancellation of GDRs through the intermediation of the depository and the sale of underlying shares in the domestic market through the local custodian.

GDRs, *per se*, are considered as common equity of the issuing company and are entitled to dividends and voting rights since the date of its issuance. The company effectively transacts with only one entity – the Overseas Depository – for all the transactions. The voting rights of the shares are exercised by the Depository as per the understanding between the issuing company and the GDR holders.

American Depository Receipts

ADR is a dollar denominated negotiable certificate, it represents a non-US company's publicly traded equity. It was devised in the late 1920s to help Americans invest in overseas securities and to assist non-US companies wishing to have their stock traded in the American Markets. ADRs are divided into 3 levels based on the regulation and privilege of each company's issue.

i. **ADR Level-I:** It is often the first step for an issuer into the US public equity market. The issuer can enlarge the market for existing shares and thus diversify the investor base. In this instrument only minimum disclosure is required to the SEC and the issuer need not comply with the US GAAP (Generally Accepted Accounting Principles). This type of instrument is traded in the US OTC market.

   The issuer is not allowed to raise fresh capital or list on any one of the national stock exchanges.

ii. **ADR Level-II:** Through this level of ADR, the company can enlarge the investor base for existing shares to a greater extent. However, significant disclosures have to be made to the SEC. The company is allowed to list on the American Stock Exchange (AMEX) or New York Stock Exchange (NYSE) which implies that the company must meet the listing requirements of the particular exchange.

iii. **ADR Level-III:** This level of ADR is used for raising fresh capital through public offering in the US Capital Markets. The company has to be registered with the SEC and comply with the listing requirements of AMEX/NYSE while following the US-GAAP.

Debt Instruments

EUROBONDS

The process of lending money by investing in bonds originated during the 19th century when the merchant bankers began their operations in the international markets. Issuance of Eurobonds became easier with no exchange controls and no government restrictions on the transfer of funds in international markets.

The Instruments

EUROBONDS

All Eurobonds, through their features can appeal to any class of issuer or investor. The characteristics which make them unique and flexible are:

a. No withholding of taxes of any kind on interests payments.

b. They are in bearer form with interest coupon attached.

c. They are listed on one or more stock exchanges but issues are generally traded in the over-the-counter market.

Typically, a Eurobond is issued outside the country of the currency in which it is denominated. It is like any other Euro instrument and through international syndication and underwriting, the paper is sold without any limit of geographical boundaries. Eurobonds, are generally listed on the world's stock exchanges, usually on the Luxembourg Stock Exchange.

a. **Fixed-rate Bonds/Straight debt bonds:** Straight debt bonds are fixed interest bearing securities which are redeemable at face value. The bonds issued in the Euro-market referred to as Euro-bonds, have interest rates fixed with reference to the creditworthiness of the issuer. The interest rate on dollar denominated bonds are set at a margin over the US treasury yields. The redemption of straights is done by bullet payment, where the repayment of debt will be in one lump sum at the end of the maturity period, and annual servicing.

b. **Floating Rate Notes (FRNs):** FRNs can be described as a bond issue with a maturity period varying from 5-7 years having varying coupon rates – either pegged to another security or re-fixed at periodic intervals. Conventionally, the paper is referred to as notes and not as bonds. The spreads or margin on these notes will be above 6 months LIBOR for Eurodollar deposits.

FOREIGN BONDS

These are relatively lesser known bonds issued by foreign entities for raising medium to long-term financing from domestic money centers in their domestic currencies. A brief note on the various instruments in this category is given below.

a. **Yankee Bonds:** These are US dollar denominated issues by foreign borrowers (usually foreign governments or entities, supranationals and highly rated corporate borrowers) in the US bond markets.

b. **Samurai Bonds:** These are bonds issued by non-Japanese borrowers in the domestic Japanese markets.

c. **Bulldog Bonds:** These are sterling denominated foreign bonds which are raised in the UK domestic securities market.

d. **Shibosai Bonds:** These are the privately placed bonds issued in the Japanese markets.

EURONOTES

Euronotes as a concept is different from syndicated bank credit and is different from Eurobonds in terms of its structure and maturity period. Euronotes command

the price of a short-term instrument usually a few basic points over LIBOR and in many instances at sub-LIBOR levels. The documentation formalities are minimal (unlike in the case of syndicated credits or bond issues) and cost savings can be achieved on that score too. The funding instrument in the form of Euronotes possess flexibility and can be tailored to suit the specific requirements of different types of borrowers. There are numerous applications of basic concepts of Euronotes. These may be categorized under the following heads:

a. **Commercial Paper:** These are short-term unsecured promissory notes which repay a fixed amount on a certain future date. These are normally issued at a discount to face value.

b. **Note Issuance Facilities (NIFs):** The currency involved is mostly US dollars. A NIF is a medium-term legally binding commitment under which a borrower can issue short-term paper, of up to one year. The underlying currency is mostly US dollar. Underwriting banks are committed either to purchase any notes which the borrower is unable to sell, or to provide standing credit. These can be re-issued periodically.

c. **Medium-Term Notes (MTNs):** MTNs are defined as sequentially issued fixed interest securities which have a maturity of over one year. A typical MTN program enables an issuer to issue Euronotes for different maturities, from over one year up to the desired level of maturity. These are essentially fixed rate funding arrangements as the price of each preferred maturity is determined and fixed up front at the time of launching. These are conceived as non-underwritten facilities, even though international markets have started offering underwriting support in specific instances.

A Global MTN (G-MTN) is issued worldwide by tapping Euro as well as the US markets under the same program.

Under G-MTN programs, issuers of different credit ratings are able to raise finance by accessing retail as well as institutional investors. In view of flexible access, speed and efficiency, and enhanced investor base G-MTN programs afford numerous benefits to the issuers.

Spreads paid on MTNs depend on credit ratings, treasury yield curve and the familiarity of the issuers among investors. Investors include Private Banks, Pension Funds, Mutual Funds and Insurance Companies.

Forex Market

The unevenly distributed natural resources on the globe resulted in interdependence amongst nations, giving rise to exchange of goods and services to meet mutual requirements, resulting in international trade. Every sovereign country in the world has a currency which is a legal tender in its territory and which does not act as money outside its boundaries. Therefore, whenever a country buys and sells goods and services from or to another country, the residents of the two countries have to exchange currencies.

Need for Foreign Exchange

Let us consider a transaction involving supply of leather bags and wears from India to Italy. The Indian exporter will price the leather bags in such a manner that he would make profit in terms of Indian Rupees. He will like the customer abroad to pay him in terms of Rupees only. The purchasing power available with the Italian buyer is Italian Lira and thus, he would like to know how many Italian Liras he has to part with, to buy the leather bags.

In this example, both seller and the buyer agree to settle the transaction in third currency, say, US Dollar. The above transactions giving rise to a mechanism by which a currency is converted into other is referred to as ‘foreign exchange’.

In the above example, the transactions between two countries are settled in a third currency, that is, a currency that is neither the exporters’ nor importers’ own local currency. This means of payment is particularly popular if both countries have

infrequently traded or have weak currencies. In this case, there is a need for the foreign exchange market in which the importers purchase the third currency against (sell) their own currency, and exporters sell the third currency against (purchase) their own.

As said above, Foreign Exchange is a method of converting one currency to the other; and while converting, the home currency is treated as purchasing power and the foreign currency is traded as a commodity.

Definition

According to Section 2(b) Foreign Exchange Regulation Act, 1973, foreign exchange is defined as

i. All deposits, credits, balance of payments in foreign currency and any drafts, travelers' cheques, letters of credit and bills of exchange expressed or drawn in Indian currency and payable in foreign currency;

ii. Any instrument payable at the option of the drawee or holder thereof or any other party thereto, within Indian currency or in foreign currency or partly in one and partly in the other.

Foreign Exchange Market

Foreign exchange market is similar to money market, where financial paper with relatively short maturity is traded. But, in forex market, financial paper is not denominated in the same currency. However, in this market, paper denominated in a given currency is always traded against paper denominated in another currency. One reason justified for the existence of foreign exchange market is that each nation has decided to keep its sovereign right to have control on its own currency. If every country in the world used the same currency, then there will not be any need for foreign exchange market.

Telephonic Market

In spite of being the world's largest market, there is no physical location for the foreign exchange market where traders can get together and exchange currencies. The traders sit in their dealing rooms and communicate with each other through telephones, computer terminals, telexes and other information channels. This market functions virtually for 24 hours enabling a trader to offset a position created in one market using another market.

A trader is interested in striking a deal than making a physical delivery. After each transaction, the forex dealer of a bank records on a computer system, and moves on to the next trade. During the actual settlement, at banks' level, the confirmation messages and details regarding the trade are matched. However, physical deliveries take place at a later point of time.

Geographic Location

The international foreign exchange market geographically extends from Tokyo and Sydney through Hong Kong, Singapore, Bahrain, the European centers, New York to the west coast of the US. It extends through all the time zones, and is almost a 24-hour market.

Exchange Rate

The rate at which one currency is converted into another currency is the rate of exchange between the two currencies concerned. The exchange rate between two currencies can be obtained from quotation in foreign exchange rate market and it is quoted in two ways.

Direct Quotation and Indirect Quotation

DIRECT QUOTATION

Under this method, the exchange rate is expressed as the price per unit of foreign currency in terms of home or local currency equal to one unit of foreign currency.

For example, 1 US $ = Rs.42.50

This is a direct exchange rate for the US dollar in India.

In a direct quotation, the principle adopted is "buy low, sell high"; profit is made by buying low and selling high the usual strategy adopted in buying and selling.

INDIRECT QUOTATION

Under this method, the unit of home currency is kept constant and the exchange rate is expressed as so many units of foreign currency, and is known as 'Foreign currency quotation' or 'Indirect quotation'.

For example, Rs.100 = US $2.3529.

This is an indirect exchange rate for the US dollar in India.

In an indirect quotation, the principle adopted is "Buy high, sell low". This can be understood simply by looking into an example. If an apple vendor gets 25 apples for Rs.100 from his supplier and sells 20 apples for Rs.100, he would make a profit. This concept holds good in case of indirect quotation; thus profit is made by buying more number and selling less number per unit.

Two-way Quotation

Foreign exchange quotations have two rates – the buying and selling of currency rates are referred as the bid and offer rates. In case of direct quotation, the lower of the two rates is the buying rate and the higher is the selling rate. For example, USD 1 = Rs.42.50 – Rs.43.20.

In this example, 42.50 is buying rate and 43.20 is selling rate.

In case of indirect quotation, the higher of two rates is the buying rate and the lower rate is the selling rate.

For example, Rs.2.35 – 2.31

This means the banker agrees to sell at the rate of USD 2.31 per Rs.100 and buy at the rate of USD 2.35 per Rs.100.

Value Date Concept

In foreign exchange market, the time element is taken into account by dividing the market into spot and forward markets. The day on which the delivery takes place is referred to as 'value date'. Value date differs in spot and forward transactions. If the agreement to buy and sell is agreed upon and executed on the same date, the transaction is known as 'cash transaction' or 'ready transaction'. If the delivery date is the next working day, then it is referred to as 'Tom market'. This market is referred to as 'spot market', if the foreign currency is delivered on the second business day.

If the delivery of foreign currency takes place at a specified future date, it is referred to as a 'forward transaction'. The duration for forward contract usually varies from one month to three months.

Various Participants in Forex Market

Anyone who exchanges currency of a given country for other, or who needs such services, is a participant of the forex market.

Commercial banks are the main participants of the forex market in any country. Next in importance are the large corporates with investments abroad or foreign trade activities. Lastly, central banks play an inevitable role in maintaining the foreign reserves and payments.

Exporters – Exporters may require the services of banks to convert their foreign currency receipts into domestic currency (which they obtain by means of selling the goods and services).

Importers – Importers requiring to pay for the goods imported by them, may utilize the services of banks for converting the local currencies into foreign currencies (which they need to make payments for the goods and services they have imported).

COMMERCIAL BANKS

Commercial banks deal with international trade transactions and offer services of converting one currency into another. Usually, the commercial banks act as intermediaries between importers and exporters who are situated in different countries. A commercial bank which offers services, would sell foreign currencies to importers and buy foreign currencies from exporters.

Commercial banks intervene through sale or purchase of foreign currencies to maintain price equilibrium of home currency. The bank in order to avoid risk on account of exchange rate movements, corrects its position in the market i.e. if the bank is having an oversold position it will buy from the market and if it has an overbought position it will sell in the market. This act of bank will trigger a spate of buying and selling foreign exchange in the market.

BROKERS

The foreign exchange brokers in India are prohibited to deal on their own account which means they cannot acquire any position. The forex brokers bring the seller and buyer banks together without disclosing the name of the counterparty bank before the deal is finalized. The forex brokers are governed by the rules framed by the Foreign Exchange Dealers Association of India (FEDAI). Brokers also render their services by giving market information to the banks.

CENTRAL BANKS

The central banks in most of the countries have been charged with the responsibility of maintaining external value of the currency of the country. If a country is following fixed exchange rate system, then the central bank has to take necessary steps to maintain the rate. Even if the country is following a floating exchange rate system, the central bank needs to ensure orderliness in the movement of exchange rates by intervening in the forex market.

In India, the responsibility and authority of administration of foreign exchange is vested with the Reserve Bank of India under FEMA. Due to the vast geography and, foreign exchange received and required by large number of importers and exporters, it would be impossible for the RBI to deal with every one individually. Therefore, a provision was made in the Act enabling Reserve Bank to delegate its power or functions to authorized dealers or money changers, with prior approval of the Central Government, to others.

Authorized Dealers in Foreign Exchange

- Authorizations in the form of licenses to deal in foreign exchange are granted to banks, which are well equipped to undertake foreign exchange transactions in India.
- Authorizations have also been granted to certain financial institutions to undertake specific types of foreign exchange transactions incidental to their main business.
- Authorizations have also been issued to certain State Co-operative/Urban Co-operative banks and Scheduled Commercial banks to open and maintain ordinary Non-Resident Rupee Accounts (NRO Accounts) and Non-Resident (External) Rupee Accounts (NRE Accounts) on behalf of Non-Resident individuals of Indian nationality or origin.

Authorized Money Changers

In order to provide facilities for encashment of foreign currency to visitors from abroad, especially foreign tourists, RBI has granted licenses to certain established firms, hotels, and other organizations permitting them to deal in foreign currency notes, coins, and traveler's cheques subject to directions issued to them from time to time. These firms and organizations are known as "authorized money changers" and fall into two categories.

i. Full-fledged money changers, who are authorized to undertake both purchase and sale transactions with the public.

ii. Restricted money changers, who are authorized only to purchase foreign currency notes, coins, and traveler's cheques, subject to condition that all such collections are surrendered by them in turn to an authorized dealer in foreign exchange.

Derivatives Market

By now the reader must have been familiar with the features of financial markets, through which banks, corporates, government raise or deploy money to meet their requirements. Among all the markets discussed till now, the primary market is used for raising money and secondary market is used for trading the securities which have been issued in the primary markets. Derivatives market is quite different from other markets, as it is used to minimize the risk arising from the underlying assets. Let us see what a derivatives market is and how it helps in minimizing the risk.

The word 'derivative' originates from mathematics; it refers to a variable which has been derived from another variable. A financial derivative is a product derived from the market of another product. Hence, derivative market has no independent existence without an underlying commodity or asset. The price of derivative instrument is contingent on the value of its underlying asset.

In general, a business is subject to risks, which is a common phenomenon. Only some and not all of the risks can be avoided. Risks that arise from erratic movements in markets are beyond individual's control. The unpredictable/ predictable movements may sometimes effect adversely and may have severe impact on the revenues and costs of the firm and even threaten the viability of business. Hence, the corporates need to minimize or limit the impact of such movements on their businesses.

Derivatives are designed to manage risks, which arise from movements in markets. The derivative markets enable institutional investors, bank treasurers and corporates to manage their risk more efficiently and allow them to hedge or speculate (explained below) on markets.

PARTICIPANTS

Generally, banks, corporates, financial institutions, individuals and brokers are seen as regular participants. The derivative markets allow the participants to hedge, speculate or arbitrage in the markets. The participants can be classified into three categories based on the motives and strategies adopted.

Hedgers

Hedging is an act, whereby an investor seeks to protect a position or anticipated position in the spot market by using an opposite position in derivatives. The parties which perform hedging are known as hedgers.

In the process of hedging, parties such as individuals or companies owning or planning to own, a cash commodity (such as corn, pepper, wheat, treasury bonds, notes, bills, etc.) are concerned that the cost of the commodity may change before either buying (or selling) it in the cash market. They want to reduce or limit the impact of such movements which, if not covered, would incur a loss. In such a situation, the hedger achieves protection against changing prices by purchasing or selling futures contracts of the same type and quantity. Similar objectives can be achieved with options. If the price of an asset is intended to fall then put options may be purchased and if it is likely to rise, a call option can be purchased.

Speculators

Speculators are basically traders who enter the futures or options contract, with a view to make profit from the subsequent price movements. They do not have any risk to hedge; in fact, they operate at a high level of risk in anticipation of profits. Though the desirability of speculation is always subject to a debate, it provides liquidity. The speculators also perform a valuable economic function of feeding information which is not readily available elsewhere, and help others in analyzing the derivatives markets.

ARBITRAGEURS

The act of obtaining risk-free profits by simultaneously buying and selling similar instruments in different markets is known as 'arbitrage'. The person who does this activity is referred to as an 'arbitrageur'. For example, one could always sell a stock on NSE and buy on BSE. The arbitrageurs continuously monitor various markets, and whenever there is a chance of arbitraging, they buy from one market and sell it in the other and make riskless profit. They keep the prices of derivatives and current underlying assets closely consistent, thereby performing a very valuable economic function.

Arbitrageurs and speculators can be categorized into more or less same strata, as both of them perform almost a similar function since they do not have any risk to hedge. They help in identifying inefficiencies and mispricing of assets including derivatives and help in removing the differences that exist among the markets. While arbitrageurs help in price discovery leading to market efficiency, speculators help in enhancing the liquidity in the market.

Virtually, all derivatives can be classified into two categories based on the nature of contract such as futures and options or a combination of the two.

Futures

A futures contract is a form of forward contract which conveys an agreement to buy or sell a specific amount of a commodity or financial instrument at a particular price on a stipulated future date. A futures contract obligates the buyer to purchase the underlying instrument, and the seller to sell it, unless the contract is sold to another before settlement date, which may happen in order to take a profit or limit a loss.

FUTURES MARKET

The following are the features of a futures market:

- Futures contracts are highly uniform and well specified commitments for a carefully described commodity to be delivered at a certain time and in certain manner. It also specifies the quantity and quality of the commodity that can be delivered to fulfill the futures contract. The quality specifications become less relevant in case of futures on interest rates or currencies.
- The futures contracts always are traded on an organized exchange with standardized terms of contract.
- The trading is usually done through brokers as hedgers are not located on the floor of the exchange.
- A trader can trade on his own account and bear the losses or enjoy profits arising from trading. Most of the traders act as brokers, and trade on behalf of clients. Trading on own account is known as proprietary trading.

THE CLEARING HOUSE

The clearing house ensures smooth and effective functioning of the futures market. It guarantees that all the traders in the futures market honor their obligations. It serves this role by adopting the position of a seller to a buyer and vice-versa. This means that every trader in the futures market has obligations only to the clearing house and has expectations that the clearing house will maintain its side of the bargain as well. Though it does not take any active position in the market, it interposes itself between all parties to every transaction.

It insists on margin and daily settlement for safeguarding the interests of both the parties to perform their contractual obligations. Before trading, each client needs to deposit funds with a broker. These funds serve as a good-faith deposit with the trader and are referred to as margin. The margin money is returned to the client upon proper completion of all obligations associated with a client's future position.

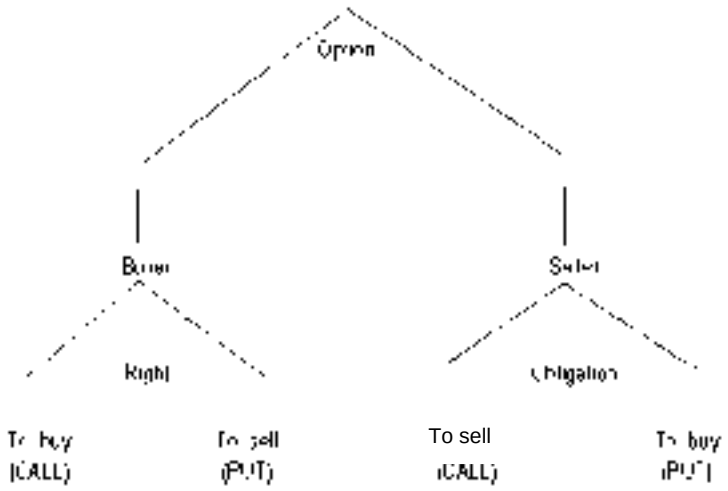
Options

DEFINITION

Option is a contract that confers the right, but not an obligation to the holder to buy (call option) or to sell (put option) an underlying asset (the asset may be a stock, currency, commodity, financial instrument or a futures contract) at a price agreed on a specific date or by a specific expiry date. The seller or writer of the option has the obligation to fulfill the contract if the holder wishes to exercise the option, for which a premium is paid.

Every exchange-traded option is either a call option or a put option. Options are created by selling and buying and for every option there is a seller and a buyer. The seller of an option is also known as option writer. In option contracts, all the rights lie with the option buyer.

Figure 2.5



As seen from the above, the seller always acquires an obligation and the buyer always acquires a right. Hence the buyer pays the seller a certain amount upfront which is known as premium.

Advantages of Trading Options

The investment required for buying a call option is less when compared to the investment required for buying the underlying assets. Hence, it is possible to acquire a risk profile of holding the underlying assets with low investment and hence higher return. This feature enables wider participation.

The buyer of an option has only a right and no obligation and hence, is subjected to limited loss and unlimited profit.

Options are very popular among the financial institutions and sophisticated investors, such as mutual funds and pension funds. This class of investors minimize their risk and maximize the return by trading options in conjunction with their stock portfolios.

Investors can also save transaction costs, avoid tax exposure and also avoid other stock market restrictions.

In India, futures on certain commodities are in existence. Trading in stock index futures and index option and stock futures and stock options have also started in Indian stock markets respectively in June 2000, June 2001, November 2001 and July 2001 respectively.

SECTION 2

FINANCIAL INSTITUTIONS

All India Development Banks

INDUSTRIAL DEVELOPMENT BANK OF INDIA (IDBI)

Industrial Development Bank of India (IDBI) was established in 1964 as a subsidiary of the Reserve Bank of India by an Act of the parliament and was made a wholly owned government of India undertaking in 1975. It was established with the main objective of serving as an apex financial institution to coordinate the functioning of all other financial institutions. Planning, promoting and developing industries to fill the gaps in the industrial structure of the country, providing technical and administrative assistance for promotion or expansion of industry, undertaking market and investment research surveys in connection with the development of the industry and to provide finance keeping in view the national priorities irrespective of the financial attractiveness of projects are its other objectives. IDBI finances industries directly and also supports State Financial Corporations and State Industrial Development Corporations by providing refinance and through the bill rediscounting scheme. IDBI was transformed from financial institution to commercial bank in the year 2004.

INDUSTRIAL FINANCE CORPORATION OF INDIA (IFCI)

Industrial Finance Corporation of India (IFCI) is the first financial institution to be established in India in 1948 by an Act of the parliament with the objective of providing medium and long-term finance to industrial concerns eligible for financing under the Act. The sectors for which the IFCI provides finance extend through the industrial spectrum of the country.

INDUSTRIAL INVESTMENT BANK OF INDIA (IIBI)

The IIBI first came into existence as a central government corporation with the name Industrial Reconstruction Corporation of India in 1971. Its basic objective was to finance the reconstruction and rehabilitation of sick and closed industrial units. Its name was changed to Industrial Reconstruction Bank of India and it was made the principal credit and reconstruction agency in the country in 1985 through the IRBI Act, 1984. The bank started co-ordinating similar work of other institutions and banks, preparing schemes for reconstruction by restructuring the liabilities, appraising schemes of mergers and amalgamation of sick companies, and providing financial assistance for modernization, expansion, diversification, and technological upgradation of sick units.

In March, 1997, in line with the ongoing policies of financial and economic reforms, IRBI was converted into a full-fledged Development Financial Institution. It was renamed as Industrial Investment Bank of India Limited and was incorporated as a company under the Companies Act, 1956. Its entire equity is currently being held by the Government of India. Its activities include providing finance for the establishment of new industrial projects as well as for expansion, diversification and modernization of existing industrial enterprises. It provides financial assistance in the form of term loans, subscription to debentures/equity shares and deferred payment guarantees. IIBI is now also active in Merchant Banking and its services include, *inter alia*, structuring of suitable instruments for public/rights issues, preparation of prospectus/offer documents and working as lead manager. It also offers its services for debt syndication, and the entire package of services for mergers and acquisitions.

THE EXPORT-IMPORT BANK OF INDIA (EXIM BANK)

The EXIM Bank was set up in 1982 to coordinate the activities of the various institutions engaged in trade finance. It helps Indian exporters in extending credit to their overseas customers by providing long-term finance to them. It also provides assistance to banks in extending credit for exports and export-linked imports. It also provides advisory services and information to exporters.

STATE FINANCIAL CORPORATIONS (SFCS)

At the beginning of the fifties, the government found that for achieving rapid industrialization, separate institutions should be set up that cater exclusively to the needs of the small and medium sector. Therefore the SFCs Act was passed by the parliament in 1951 to enable the state governments establish SFCs. The basic objective for which the SFCs were set up was to provide financial assistance to small and medium scale industries and establish industrial estates. The SFCs provide finance in the form of term loans, by underwriting issues of shares and debentures, by subscribing to debentures, and standing guarantee for loans raised from other institutions and from the general public.

STATE INDUSTRIAL DEVELOPMENT CORPORATIONS (SIDCS)

The State Industrial Development Corporations have been set up to facilitate rapid industrial growth in the respective states. In addition to providing finance, the SIDCs identify and sponsor projects in the joint sector with the participation of private entrepreneurs.

Investment Institutions

LIFE INSURANCE CORPORATION OF INDIA (LIC)

The LIC was established in 1956 by amalgamation and nationalization of 245 private insurance companies by an enactment of the parliament. The main business of the LIC is to provide life insurance and it has almost a monopoly in this business. The LIC Act permits it to invest up to 10 percent of the investible funds in the private sector. It provides finance by participating in a consortium with other institutions and does not undertake independent appraisal of projects.

GENERAL INSURANCE CORPORATION OF INDIA (GIC)

The GIC was established in 1974 with the nationalization of the general insurance business in the country. It can invest up to 30 percent of the fresh accrual of funds in the private sector. Like the LIC, the GIC also provides finance by participating in consortium based on the appraisal made by the other financial institutions but does not independently provide the finance.

UNIT TRUST OF INDIA (UTI)

The UTI was founded in 1964 under the Unit Trust of India Act, 1963. Initially 50 percent of the capital of the trust was contributed by the RBI while the rest was brought in by the State Bank of India and its associates, LIC, GIC, and other financial institutions. In 1974, the holding of the RBI was transferred to the IDBI making the UTI an associate of the IDBI. The primary objective of the UTI is to mobilize the savings in the country and channelize them into productive corporate investments. UTI provides assistance by underwriting shares and debentures, subscription to public and rights issue of shares and debentures, subscription to private placement, and bridge finance. In January, 2003, UTI was split into two parts UTI-I and UTI-II. UTI-I has been given all the assured return schemes and Unit Scheme 64, and it is being administered by Central Government. UTI-II is entrusted with the task of managing NAV-based schemes. UTI-II is being managed by State Bank of India, Punjab National Bank, Bank of Baroda and Life Insurance Corporations.

MUTUAL FUNDS

Mutual funds serve the purpose of mobilization of funds from various categories of investors and channelizing them into productive investment. Apart from UTI, mutual funds sponsored by various bank subsidiaries, insurance organizations, private sector financial institutions, DFIs and FIIs have come up. These mutual funds operate within the framework of SEBI regulations which prescribe the mechanism for setting up of a mutual fund, procedure of registration, its constitution and the duties, functions and the responsibility of the various parties involved.

SECTION 3

FUNCTIONS OF RESERVE BANK OF INDIA

The Reserve Bank of India is considered as the nerve center of Indian monetary system. It was established on 1st April, 1935 under the Reserve Bank of India Act. It was a private shareholder's institution till 1947. The bank was nationalized in 1948 under the RBI Act, 1948, soon after independence for three main reasons. Firstly, immediately after the second world war, the central banks all over the world were nationalized. Secondly, to control inflation that was prevailing since 1939 and thirdly, to embark upon a program of economic development and growth in the country.

Since its inception, the RBI is guiding, monitoring, regulating, promoting and controlling the Indian financial system. The apex bank was given powers to: regulate the issuance of notes, act as banker to the Government, maintain price stability, and maintain a control over money supply in the country. It also has been allowed to carry out open market operations. All the powers were given to Reserve Bank, like any other Central bank in the world, to promote economic development.

Hierarchy

The bank is managed by the Central Board of Directors, four local Boards of Directors, and a Committee of the Central Board of Directors. The functions of the Local Boards are to advise the Central Board on such matters as are referred to them. The final control of bank vests in the Central Board which comprises the Governor, four Deputy Governors and fifteen Directors nominated by the Central Government. The internal organizational set-up of Reserve Bank has been modified and expanded from time to time in order to meet the increasing volume and range of the Banks' activities. The Bank has been decentralizing to perform various functions effectively.

Functions of RBI

One of the main functions of the Central bank in any country is monetary management, – regulation of the quantity of money and the supply and availability of credit to business and industry. Similarly, the RBI performs the following functions:

Currency Issuing Authority

The Reserve Bank of India, since its inception, has the sole right or monopoly authority in issuing the currency in the country, other than one rupee coins/notes and subsidiary coins. Although the one rupee coins are issued by the Central Government, RBI puts them into circulation. It issues notes in denominations of rupees two, five, ten, twenty, fifty, one, five hundred and one thousand. All the notes carry a guarantee by the central government.

The Reserve Bank can issue notes against the security of gold coins, gold bullions, foreign securities, rupee coins, Government of India securities and Bills of exchange and promissory notes, as they are eligible for purchase by Reserve Bank.

The responsibility of RBI is not only to put currency into circulation or to withdraw from it, but also to exchange notes and coins of one denomination to the other as demanded by public. The issue department of the Reserve Bank monitors all the matters relating to note issuance.

Government Banker

The Reserve Bank acts as a banker not only to the Central government but also to all State Governments. It plays a key role by offering all banking services to governments by accepting cheques, receiving and collecting payments, transferring funds, etc.

The bank also provides 'Ways and Means Advances (WMA)' to both Central and State governments for bridging the temporary gaps between receipts and payments with a maturity of 3 months. There are three different types of WMA; normal or clean WMA, without any underlying security, secured WMA, which are granted against Central Government securities and finally, special WMA, which are issued by RBI at its discretion.

The RBI permits the state government to draw overdrafts apart from ways and means advances. The Reserve Bank charges interest on overdrafts up to and inclusive of the seventh day at the bank rate and later on at 3 percent above the bank rate.

Issue management and administration of public debts constitute major functions of RBI as a banker to the Governments.

The Banker's Bank

The RBI, like all central banks, can be called banker's bank because it has a unique relationship with scheduled commercial and co-operative banks. The Reserve Bank stipulates that the commercial banks maintain the reserves in the form of SLR and CRR. The Reserve Bank provides in a limited way avenues for banks to obtain liquidity in the normal course of operation. In case of any crisis, RBI can provide the necessary liquidity support to the banks. Hence, the RBI is known as the 'lender of last resort' to commercial banks. The RBI provides credit to the commercial banks and they in turn provide it to their clients, to promote economic growth. As of now, this is limited to export credit where banks can draw refinance from RBI subject to conditions.

The central bank has the vast power to control commercial and co-operative banks with a view to develop a sound banking system in India. In this regard, the following are the powers given to RBI:

- To issue licenses for establishment of new banks and setting up of branches for existing banks.
- To prescribe minimum requirements regarding paid-up capital and reserves, transfer to reserve fund and maintenance of cash reserves and other liquid assets.
- To inspect the working of banks that are established in India and abroad in respect of their organizational set-up, branch expansion, investments and credit portfolio management, credit appraisal, etc.
- To conduct ad hoc investigations into complaints, irregularities and frauds in respect of banks from time to time.
- To control appointment and reappointment and termination of appointed Chairman and Chief executive officers of the private sector banks.

According to Section 21 of RBI Act, the RBI has been given the power of selective credit control. It is empowered to determine the policy in relation to advances to be followed by banks generally or by any bank in particular. It is also authorized to issue directions to banks as regards the purpose of the advances, the margins to be maintained for secured advances and also prescribe the interest rate.

The RBI exercises the selective credit control through the following instruments:

- The bank rate.
- Open market operations.
- Variable reserve requirements.

THE BANK RATE

It is the rate at which the Reserve Bank rediscounts the first class commercial bills of exchange. The effect of change in bank rate will make the cost of securing funds either cheaper or costlier than central bank. Whenever the volume of bank credit is to be expanded, RBI reduces the bank rate and vice versa. However, the efficacy of the bank rate depends on the extent of integration in the money market and also on commercial banks' borrowings from RBI. In todays' financial market, the bank rate has become the reference rate, as the interest rates have been deregulated, and they are determined by demand and supply of funds in the market. Thus the bank rate has a signalling value.

OPEN MARKET OPERATIONS

The RBI can influence the reserves of commercial banks, i.e., the cash base of commercial banks, by selling and buying the government securities in the open market. If the RBI buys government securities from commercial banks in the market, the cash transfer will be from RBI to banks and hence, there is an increase in cash base of the commercial banks enabling them to expand credit and converse is the effect if it sells.

Usually, the success of the open market operations depends on the size of the government securities available, their range and variety. Most importantly, the prices quoted by RBI should be attractive when compared to the market prices.

RESERVE REQUIREMENTS

The central bank regulates the liquidity of the banking system through two complementary methods such as Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR).

CRR

CRR is the average daily balance with RBI, the percentage of CRR will be specified by RBI from time to time on Net Demand and Time Liabilities (NDTL). It is the cash that banks deposit with Reserve Bank as a proportion of their deposits.

SLR

In addition to the cash reserve ratio, the banks are required to maintain specified reserves in the form of government securities, specified bonds and approved securities.

EXCHANGE CONTROLS

One of the key functions of the Reserve Bank is to maintain the stability of external value of the Indian rupee. The objective of exchange control is to regulate the demand for foreign exchange within the limits set by the available supply. RBI undertakes:

- to manage exchange reserves
- to administer the foreign exchange control
- to choose the exchange rate system and fix or manage the exchange reserves.

As the Central bank is the custodian of the country's foreign exchange reserves it is vested with the responsibility of managing the investment and utilization of reserves in foreign exchange. The Reserve Bank manages buying and selling of foreign exchange from and to commercial banks (who are authorized dealers in Indian forex markets). The apex bank also manages the investment of reserves in gold accounts abroad and the shares and securities issued by foreign governments and international banks or financial institutions.

Developmental Activities

The Central bank has to perform not merely the role of controlling credit and currency to maintain the internal and external value of the rupee to ensure price stability in the economy, but also play the role of a promoter of financial institutions in the country. The bank also performs a wide range of promotional functions to support the pace of economic development.

The RBI has been undertaking various steps to promote economic growth in general and markets in particular.

i. It has promoted specialized institutions such as IDBI, NABARD to ensure flow of credit.
ii. It has provided agencies like DFHI, STCI as a part of its activity to develop markets.
iii. It has introduced various schemes to promote a bill culture.

NATURE OF COMMERCIAL BANKS

Commercial banks are the oldest, biggest, and fastest growing financial intermediaries in India. They are also the most important depositories of public saving and the most important disbursers of finance. Commercial banking in India is a unique system, and exists nowhere else in the world.

The banking system in India works under the constraints that go with social control and public ownership. The public ownership of banks has been achieved in three stages: 1955, July 1969, and April 1980. Not only the public sector banks but also the private sector and foreign banks are required to meet targets in respect of sectoral deployment of credit, regional distribution of branches, and regional credit deposit ratios. The operations of banks have been determined by Lead Bank Scheme, Differential Rate of Interest Scheme, Credit Authorization Scheme, inventory norms and lending systems prescribed by the authorities, the formulation of the credit plans, and Service Area Approach.

THEORY OF BANKING OPERATIONS

Commercial banks ordinarily are simple business or commercial concerns which provide various types of financial services to customers in return for payments in one form or another, such as interest, discounts, fees, commission, and so on. Their objective is to make profits. However, what distinguishes them from other business concerns (financial as well as manufacturing) is the degree to which they have to balance the principle of profit maximization with certain other principles. In India especially, banks are required to modify their performance in profit-making if that clashes with their obligations in such areas as social welfare, social justice, and promotion of regional balance in development. In any case, compared to other business concerns, banks in general have to pay much more attention to balancing profitability with liquidity.

Liquidity

The need for maintenance of liquidity is much greater for banks than other business concerns because of the nature of their liabilities. Banks deal in other people's money, a substantial part of which is repayable on demand. That is why for banks, unlike other business concerns, liquidity management is as important as profitability management.

Banks are expected to hold voluntarily a part of their deposits in the form of ready cash which is known as cash reserves; and the ratio of cash reserves to deposits is known as the Cash Reserve Ratio (CRR) prescribed by the Central Bank of the country. The central bank also undertakes, as the lender of the last resort, to supply reserves to banks in times of genuine difficulties. It should be clear that the function of the legal reserve requirements is two-fold: to make deposits safe and liquid, and to enable the Central Bank to control the amount of bank money which the banks can create.

Another distinguishing feature of banks is that while they can create as well as transfer money (funds), other financial institutions can only transfer funds.

CREATION OF MONEY

Let us briefly discuss the basis and process of the creation of money by banks. Apart from the currency issued by the Government and Central Bank, the demand or current or checkable deposits with banks are accepted by the public as money. Therefore, since the loan operations of banks lead to the creation of checkable deposits, they add to the supply of money in the economy.

The process of money creation works as follows: Assume that the legally required reserve ratio is 10 percent and that banks are maintaining just that ratio. Assume further that a bank in the economy receives a brand new input of Rs.1,000 of reserves either as a deposit or as proceeds of a sale of Government bond to the central bank or as some other form. There is thus a creation of Rs.1,000 of bank money, but there is as yet no multiple expansion of money. If banks were required to keep 100 percent cash reserve balances, no bank would be in a position to create any extra money out of a new deposit of Rs.1,000 with it.

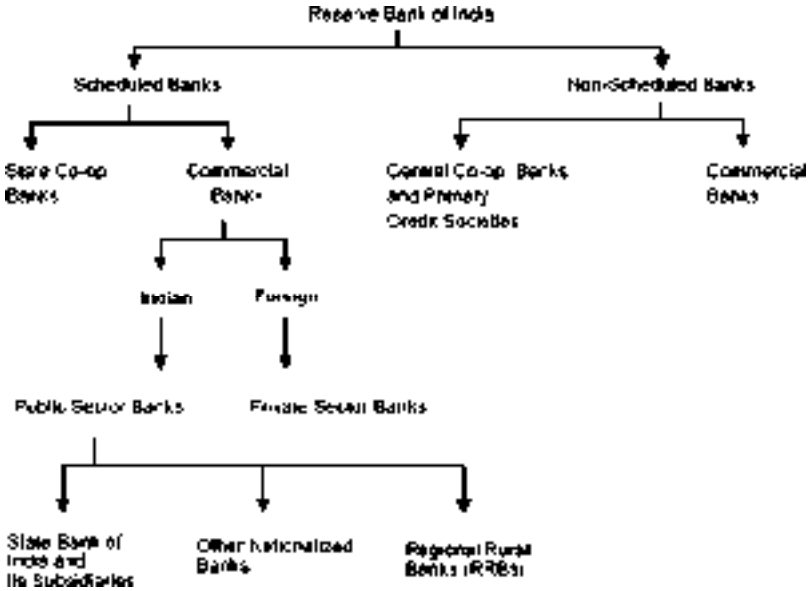
But suppose a bank is required to hold only 10 percent of its deposits as cash reserves, it now has Rs.900 as excess reserves which it can utilize to invest or to give loan. Assume that the bank gives a loan of Rs.900, and that the borrower who takes the loan in cash or cheque deposits it either with the same bank or with some other bank. Either way, there has been a creation of money and the total amount of bank money created at this stage is Rs.900. This process of creation can continue till no bank anywhere in the system has reserves in excess of the required 10 percent reserve, and the total money supply created in the economy is Rs.10,000. The ratio of new deposits to the original increase in reserves is called the money multiplier or credit multiplier or deposit multiplier. This multiplier will be equal to the reciprocal of the required reserve ratio.

The structure of the Banking System in India is shown below.

Scheduled Banks

Scheduled banks are those which are included in the Second Schedule of The Banking Regulation Act, 1949; others are non-scheduled banks. To be included in the Second Schedule a bank (a) must have paid-up capital and reserve of not less than Rs.5 lakh; (b) it must also satisfy the RBI that its affairs are not conducted in a manner detrimental to the interests of its depositors. Scheduled banks are required to maintain a certain amount of reserves with the RBI; they, in return, enjoy the facility of financial accommodation and remittance at concessional rates from the RBI.

Figure 2.6: Regional Rural Banks



Regional Rural Banks

A beginning to set up the RRBs was made in the latter half of 1975 in accordance with the recommendations of the Banking Commission. It was intended that the RRBs would operate exclusively in rural areas and would provide credit and other facilities to small and marginal farmers, agricultural laborers, artisans, and small entrepreneurs. They now carry all types of banking business generally within one to five districts. The RRBs can be set up provided any public sector bank sponsors them. The ownership capital of these banks is held by the Central Government (50 percent), concerned State Government (15 percent), and the sponsor bank (35 percent). They are, in effect, owned by the Government, and there is little local participation in the ownership and administration of these banks also. Further, they have a large number of branches.

BRANCH BANKING

The banking system in India is thus characterized by excessive concentration of business in a small number of scheduled public sector banks. The banking in India, as in the UK, is entirely of the type called branch banking. The phenomenon of branch banking has aggravated the problem of organizational and operational inefficiency in the banking sector. There is a need to decide on the optimum size of a bank in Indian conditions. Some of the banks in India appear to have become too big to function efficiently. Branch banking has accentuated another problem, namely, the drain of resources from the rural to urban areas so much so that the authorities had to set different targets of credit/deposit ratio for different geographical areas.

UNIT BANKING

The policy of promoting and nurturing unit banking system would perhaps have yielded better results. While in branch banking a single bank accepts deposits through its branches at 2 or more locations in the same city, district or state, in a unit banking system, the bank conducts its overall operations from a single office. The banks in the United States were historically unit banks under local control. The working of many private sector banks today support this viewpoint. These banks are found to be compact in size which has facilitated cutting of red tape, promoting good rapport between the staff and management, motivating the staff, and giving better service to the customers and community. The government has realized this and has sanctioned privatization of banks which is discussed further on in this lesson.

Liabilities of Banks

DEPOSITS

Commercial banks deal in other people's money which they receive as deposits of various types. These deposits serve as a means of payment and as a medium of saving, and are a very important variable in the national economy.

Indian banks accept two main types of deposits – demand deposits and term deposits. Demand deposits can be subdivided into two categories: current and savings. Current deposits are chequable accounts and there are no restrictions on the amount or the number of withdrawals from these accounts. It is possible to obtain a clean or secured overdraft on current account. Banks also extend to the account holders certain useful services such as collection of outstation cheques and issue of demand drafts. At present banks generally do not pay interest on current deposits. All current deposits are included in estimating the volume of the money supply in the economy in a given period of time.

Savings deposits earn interest; the rate of this interest is 3.5 percent at present. Although cheques can be drawn on savings accounts, the number of withdrawals and the maximum amount that might, at any time, be withdrawn from an account without previous notice remain restricted.

Call deposits is a third subcategory of demand deposits. They are accepted from fellow bankers and are repayable on demand. These deposits carry an interest charge. They form a negligible part of the total bank liabilities. Term deposits are also known as "fixed deposits" and they are a genuine savings medium. They have different maturity periods on which depends the rate of interest.

OTHER LIABILITIES

Among other liabilities of banks, demand and time deposits from other banks amount to 3 to 4 percent of total liabilities; borrowings from other banks amount to another 1 to 2 percent. Borrowings from the RBI is an item of great economic and operational significance because it indicates how far the banks' own resources have been adequate for their business, the scope for falling back on the RBI as a lender of last resort, and the ability to tighten monetary reins by the RBI. Apart from borrowings from the RBI, banks use non-deposit resources such as refinance from IDBI, NABARD, EXIM Bank and bills rediscounted with financial institutions.

Banking Assets

INVESTMENTS

Banks have four categories of assets: cash in hand and balances with the RBI, assets with the banking system, investments in Government and other approved securities, and bank credit. Among these assets, investment in cash and government securities serves the liquidity requirements of banks and is influenced by the RBI policy. Quantitatively, bank credit and investment in government securities are bank's most important assets. Commercial banks in India invest a negligible part of their resources in shares and debentures of joint-stock companies.

BANK CREDIT

Types of credit: Banks in India provide mainly short-term credit for financing working capital needs, although, as will be seen subsequently, their term loans have increased somewhat in the recent past. The various types of advances provided by them are: loans, cash credit, overdrafts (OD), demand loans, purchase and discounting of commercial bills, and installment or hire purchase credit. Loans are advances for fixed amounts repayable on demand or in installments. They are normally made in lump sums and interest is paid on the entire amount. The borrower cannot draw funds beyond the amount sanctioned.

CASH CREDITS/OVERDRAFTS

Cash credits and overdrafts are said to be running accounts, from which the borrower can withdraw funds as and when needed up to the credit limit sanctioned by his banker. Usually, while cash credit is given against the security of commodity stocks, overdrafts are allowed on personal or joint current accounts. Interest is charged on the outstanding amount borrowed and not on the credit limit sanctioned. In order to curb the misuse of this facility, banks used to levy a commitment charge on the unutilized portion of the credit limit sanctioned. However, this practice has now been discontinued. Technically, these advances are repayable on demand, and are of a short-term nature. Actually, the widely prevalent practice is to roll over these advances from time to time. As a result, cash credits actually become long-term advances in many cases. Although technically, these advances are highly liquid, it has been pointed out that it is a myth to regard them so because even the most profitable borrower would hardly be in a position to repay them on demand.

BILL FINANCING

Purchasing and discounting of bills – internal and foreign – is another method of advancing credit adopted by banks. It is done mainly to finance trade transactions and the movement of goods. Bill finance is either repayable on demand or after a period not exceeding 90 days.

Among these different systems of bank credit, cash credit/overdraft system remains the most important one. The shift away from it has been slow.

LOANS

There are two categories of loans: demand loans and term loans. The term "demand loans" has been used in India in different senses. Demand loans by convention mean loans which have to be repaid when demanded by the creditor and as such they are short-term loans.

Term loans are defined as (i) loans sanctioned for a period exceeding one year with specific schedule of repayment, (ii) interim cash credits/bridge loans pending disbursement of sanctioned term loans, and (iii) installment credit where repayment is spread over more than one year. They are advanced for purchasing fixed assets i.e., for meeting part of the capital cost of new and old projects. Commercial banks have expanded their term loans business over the years.

Lead Bank Scheme

The Lead Bank Scheme was introduced by the RBI in December, 1969 with the following objectives:

a. To survey the potential for banking, industrial, and agricultural development in a given area, mostly a district.

b. To mobilize deposits on a massive scale.

c. To increase lending, on reasonable terms, to the weaker sections of the society, along with the underdeveloped sectors and areas in the economy.

d. To make banks one of the key instruments in local development.

e. To expand the network of bank branches in unbanked and underbanked areas in a planned manner so that greater regional balance is achieved in banking development.

f. To prepare District Credit Plans (DCPs) for the lead districts.

Under this scheme, a given bank is entrusted with the responsibility of locating growth centers, assessing deposit potential, identifying functional and territorial credit gaps, and evolving co-ordinated programs of credit deployment in each district assigned to it, with the help of other banks and credit agencies. Since August 1976, the lead banks are required to assume leadership in formulating district credit plans which are the blueprints for action by banks and other financial institutions to bring about overall development of the district. The lead banks, therefore, are an important agency in the institutional arrangements for credit planning – district, regional, and national. The RBI has allotted all the districts, except metropolitan cities, to nationalized banks and each of these banks has been designated as lead bank for the districts allotted to it.

The rates at which banks lend, earlier used to be controlled by RBI. Now only for advances between Rs.25,000 and Rs.200,000, banks have to follow the structure prescribed by RBI. For loans beyond Rs.2 lakh, the determination of the interest rates has been left to the discretion of the individual banks.

Credit Cards

THE CONCEPT

What is a credit card? Quite simply, it is a card that enables one to make purchases without having to pay cash immediately. When a cardholder makes his purchases, he presents his credit card to the member establishment instead of paying cash. The retailer checks the number on the card against the list provided to him by the bank. This is the authenticity test which proves whether the cardholder is the genuine owner of the card or not. The cardholder is also required to sign on the voucher, and the signature has to tally with the one on the credit card. The merchant establishment (ME) then has to present the necessary sales vouchers to the bank, which in turn reimburses it for the customer's purchases. The bank charges a commission from the ME, rates of which vary from bank to bank. On completion of these formalities it sends the bill to the cardholder. This, broadly speaking, is the way a credit card operates.

Many, perhaps, will be surprised to learn that the custom of credit cards came to India more than three decades back, when Diners Club entered in 1961. It took twenty long years for nationalized banks to consider competition. By then, the possibilities of the credit card seemed immense: what with business having trebled in the last three years, from one-and-a-half lakh cardholders during 1988-89 to around six lakh in the late nineties, and an estimated market of around 250 million cardholders. It is, therefore, hardly surprising that all major banks have jumped into the fray.

And now with the advent of ATM, potential customers are being lured even more. What is ATM? These are Automatic Teller Machines, or popularly called Any Time Money. An ATM makes standing in queues and spending time unnecessarily at the banks, things of the past. So an ATM cardholder does not need to anxiously peer at the calendar or even his watch, when he needs cash. By just inserting a card into an ATM, he can withdraw crisp new notes at anytime of the day or night.

FINANCIAL SECTOR REFORMS

The decision to nationalize 14 commercial banks in July, 1969 was made to prevent unfair competition and concentration of economic power with industrial houses. But unfortunately with the passage of time it was seen that public sector banks degenerated into monopoly financial houses. Instead of making funds available at optimal rates to industry, a major portion of funds was made available at cheap rates to the government. In spite of the vast expansion in the branch network there was a general decline in efficiency and profits.

Privatization of Banks

Recognizing the need to introduce greater competition in the Indian banking sector which can lead to greater productivity and efficiency, the RBI allowed the entry of new private sector banks into the banking industry.

While permitting the new private sector banks, the RBI set out that they should subserve the underlying goals of the financial sector reforms, be financially viable, result in upgradation of technology in the banking sector, avoid shortcomings such as unfair pre-emption and concentration of economic power, cross holdings with industrial groups, and other such factors that beset the private sector banks prior to nationalization.

Guidelines for Private Banks

Some of the guidelines laid down by the RBI for establishment of new private sector banks are as follows:

a. Such a bank shall be registered as a public limited company under the Companies Act, 1956.

b. The bank will be governed by the provisions of the Banking Regulation Act, 1949 in regard to its authorized, subscribed and paid-up capital. The minimum paid-up capital for such a bank shall be Rs.100 crore. The promoters' contribution for such a bank shall be determined by the RBI and will also be subject to other applicable regulations.

c. The shares of the bank should be listed on stock exchanges.

d. To avoid concentration of the headquarters of new banks in metropolitan cities and other overbanked areas, while granting a license preference may be given to those whose headquarters are proposed to be located in a center which does not have the headquarters of any other bank.

e. The new bank shall not be allowed to have as a director any person who is a director of any other banking company, or of companies which among themselves are entitled to exercise voting rights in excess of 20 percent of the total voting rights of all the shareholders of the banking company.

f. The bank will be governed by the provisions of the RBI Act, 1934, the Banking Regulation Act, 1949 and other relevant statutes, in regard to its management set up, liquidity requirements and the scope of its activities. The directives, instructions, guidelines and advice given by the RBI shall be applicable to such a bank as in the case of other banks. It would be ensured that a new bank would concentrate initially on core banking activities.

g. Such a bank shall be subject to prudential norms in respect of banking operations, accounting policies and other policies as are laid down by the RBI. The bank will have to achieve a capital adequacy of eight percent of the risk weighted assets from the very beginning. Similarly, norms for income recognition, asset classification and provisioning will also be applicable to it from the beginning.

h. The bank shall have to observe priority sector lending targets as applicable to other domestic banks. However, in recognition of the fact that new entrants may require some time to lend to all categories of the priority sector, some modification in the composition of the priority sector lending may be considered by the RBI for an initial period of three years.

i. Such a bank will also have to comply with such directions of the RBI as are applicable to existing banks in the matter of export credit. As a facilitation of this it may be issued an authorized dealers' license to deal in foreign exchange, when applied for.

j. A new bank shall not be allowed to set up a subsidiary or mutual fund for at least three years after its establishment.

k. Branch opening shall be governed by the existing policy that banks are free to open branches at various centers including urban/metropolitan centers without the prior approval of the RBI once they satisfy the capital adequacy and prudential accounting norms. However, to avoid over-concentration of their branches in metropolitan areas and cities, a new bank will be required to open rural and semi-urban branches also, as may be laid down by the RBI.

l. Such a bank shall have to lay down its loan policy within the overall policy guidelines of the RBI. While doing so, it shall specifically provide prudential norms covering related party transactions.

m. Such a bank shall make full use of modern infrastructural facilities in office equipment, computer and telecommunications in order to provide good customer service. The bank should have a high powered customer grievance cell to handle customer complaints.

n. Such other conditions as the RBI may prescribe from time to time.

Insurance

Insurance is commerce; insurance product is a financial contract entered into by parties with a definite consensus of mind.

An insurance is a contract by which insurer agrees to pay the insured a compensation for specified damage loss or injury suffered in exchange for periodic payment called premium.

Classification of Insurance

Insurance is basically classified into two categories on the basis of services offered and loss that is insured against. The categories are as follows:

i. Life Insurance

ii. General Insurance.

LIFE INSURANCE

The payment of a sum of money on the death of the insured person due to natural causes (such as disease, old age, debility, etc.) or on the expiry of a certain number of years if the insured person is then alive.

GENERAL INSURANCE

Insurances other than life insurance fall within the purview of General Insurance. GI covers loss of every other physical or non-physical possession. The loss may be due to fire, theft, accident, etc. The general insurance is further classified into (i) fire insurance (ii) marine insurance (iii) miscellaneous insurance.

Fire Insurance

It covers movable and immovable property having monetary value. It covers the loss or damage to insured property by specified perils. For example, the damage by fire to property in manufacturing premises may result in total or partial stoppage of production leading to loss of profits. Such loss of profits can be covered under loss of profits (fire) insurance policy.

Marine Insurance

It is one of the oldest branches of insurance. It plays a significant role in both internal and international trade. A marine cargo insurance policy is an important document in international trade and provides collateral security to the banks. The insurers undertake to indemnify the insured against losses that occur during transit by road, rail, sea or air.

Miscellaneous Insurance

Insurance that does not fall under the above categories is covered under the category of accident insurance. Such insurance has no relation with an accident, and hence is now more appropriately referred to as miscellaneous insurance. It covers several classes of which, motor insurance, burglary insurance, personal accident insurance, liability insurance, aviation insurance, cattle and crop insurance, are the most important.

Since insurance is an inevitable necessity, the extent to which it needs to be deregulated becomes a crucial issue. As an extention to liberalization, the Government appointed Mr. R N Malhotra, former Governor of RBI, to submit a report on how to reform the insurance sector.

INSURANCE REGULATORY AND DEVELOPMENT AUTHORITY (IRDA)

The committee opined that the insurance regulatory apparatus should be activated even in the existing set-up of nationalized insurance sector and recommended the establishment of strong and effective Insurance Regulatory Authority on the lines of SEBI. Insurance Regulatory Authority was initially constituted through a Government resolution, as was done in the case of SEBI.

The Insurance Regulatory and Development Authority Act, 1999 (IRDA) was enacted in the fiftieth year of the Republic of India. The IRDA is a body corporate having perpetual succession and a common seal with power to acquire, hold and dispose off property, and to contract. It will consist of a Chairperson, not more than five whole-time members and not more than four part-time members. The Chairperson and every other whole-time member shall hold office for a term of five years from the date on which he enters upon his office and shall be eligible for reappointment until the age of 65 years in the case of the Chairperson and 62 years in the case of other whole-time members.

The IRDA shall have the duty to regulate, promote and ensure orderly growth of the insurance and re-insurance business. The powers and functions of the Authority shall include –

a. Protection of the interests of the policyholders in matters concerning assigning of policy, nomination by policyholders, insurable interest, settlement of insurance claim, surrender value of policy and other terms and conditions of contract of insurance;

b. Issue certificate of registration, renew, modify withdraw, suspend or cancel such registration;

c. Specifying requisite qualifications, code of conduct and practical training for intermediary or insurance intermediaries and agents;

d. Specifying the code of conduct for surveyors and loss assessors;

e. Promoting efficiency in the conduct of insurance business;

f. Promoting and regulating professional organizations connected with the insurance and reinsurance business;

g. Calling for information from, undertaking inspection of, conducting enquiries and investigations including audit of the insurers, intermediaries, insurance intermediaries and other organizations connected with the insurance business;

h. Control and regulation of rates, advantages, terms and conditions that may be offered by insurers in respect of general insurance business not so controlled and regulated by the Tariff Advisory Committee;

i. Regulating investment of funds by insurance companies;

j. Adjudication of disputes between insurers and intermediaries or insurance intermediaries;

k. Supervising the functioning of the Tariff Advisory Committee;

l. Specifying the percentage of life insurance business and general insurance business to be undertaken by the insurer in the rural or social sector.

Ever since liberalization began in the early '90s there has been intense debate over the extent the insurance sector has to be deregulated in India. The IRDA being the sole regulatory and development authority, would be concentrating on healthy development and orderly growth of one insurance industry in India. Its role has become very important in the wake of the entry of private sector in the insurance industry.

CLASSIFICATION OF NON-BANKING FINANCIAL COMPANIES

The various Non-Banking Financial Companies (NBFCs) can be classified as follows:

- Investment Trusts or Investment Companies
- Nidhis or Mutual Benefit Funds or Mutual Benefit Finance Companies
- Merchant Banks
- Hire-purchase Finance Companies
- Lease Finance Companies or Leasing or Equipment Leasing Companies
- Housing Finance Institutions (Companies)
- Venture Capital Funds, and
- Factors or Factoring Companies.

Investment Trusts or Investment Companies

Investment trusts are close-ended organizations, unlike UTI, and they have a fixed amount of authorized capital and a stated amount of issued capital. Investment trusts provide useful services through conserving and managing property for those who, for some reasons or other cannot manage their own affairs. Investors of moderate means are provided facilities for diversification of investment, expert advice on lucrative investment channels, and supervision of their investment. From the point of view of the economy, they help to mobilize small savings and direct them to fruitful channels. They also have a stabilizing effect on stock markets. Unlike in other countries, they render manifold functions such as financing, underwriting, promoting and banking.

Most of these companies are not independent; they are investment holding companies, formed by the former managing agents, or business houses. As such, they provide finance mainly to such companies as are associated with these business houses.

Nidhis

Mutual benefit funds or nidhis, as they are called in India, are joint stock companies operating mainly in South India, particularly in Tamil Nadu. The sources of their funds are share capital, deposits from their members, and the public. The deposits are fixed and recurring. Unlike other NBFCs, nidhis also accept demand deposits to some extent.

The loans given by these institutions are mainly for consumption purposes. These loans are usually secured loans, given against the security of tangible assets such as house property, gold, jewelry, or against shares of companies, LIC policies, and so on. The terms on which loans are given are quite moderate. The notable points about these institutions are:

(a) They offer saving schemes which are linked with assurances to make credit available when required by savers; (b) they make credit available to those to whom the commercial banks may hesitate to give credit or whom commercial banks have not been able to reach; (c) they possess characteristics such as their local character, easy approachability, and the absence of cumbersome procedures, which make them suitable institutions for small areas; and (d) interest rates on their deposits and loans are comparable to those of commercial banks, and they work on sound principles of banking. Their operations are similar to those of unit banks. They are incorporated bodies and are governed by the directives of the RBI.

Merchant Banks

It would help in understanding the nature of merchant banking if we compare it with commercial banking. The MBs offer mainly financial advice and services for a fee, while commercial banks accept deposits and lend money. When MBs do function as commercial banks, they function essentially as wholesale bankers rather than retail bankers. It means that they deal with selective large industrial clients and not with the general public in their fund based activities. The merchant banks are different from securities dealers, traders, and brokers also. They deal mainly in new issues, while the latter deal mainly in existing securities.

The range of activities undertaken by merchant banks can be understood from a recent advertisement of one of the merchant bankers in India which mentioned the following as the services offered by it: (i) management, marketing, and underwriting of new issues; (ii) project promotion services and project finance; (iii) syndication of credit and other facilities; (iv) leasing, including project leasing; (v) corporate advisory services; (vi) investment advisory services; (vii) bought-out deals; (viii) venture capital; (ix) mutual funds and offshore funds; (x) investment management including discretionary management; (xi) assistance for technical and financial collaboration and joint ventures; (xii) investment services for non-resident Indians; and (xiii) management of and dealing in commercial paper.

In India, the merchant banking services are provided by the Commercial Banks, All India Financial Institutions, Private Consultancy Firms and Technical Consultation Organizations.

Apart from these institutions, professional merchant banking houses are slowly coming up in India. In March, 1991, SEBI granted permission to VMC Project Technologies to act as the merchant banker and to undertake public issue management, portfolio management, lead management, and so on. It may be noted that in India, the permission of the SEBI is required to do merchant banking business.

Hire Purchase Finance Companies

Hire purchase involves a system under which term loans for purchases of goods and services are advanced to be liquidated in stages through a contractual obligation. The goods whose purchases are thus financed may be consumer goods or producer goods or they may be simply services such as air travel.

Hire-purchase credit may be provided by the seller himself or by any financial institution.

Hire-purchase credit is available in India for a wide range of products and services. Products like automobiles, sewing machines, radios, refrigerators, TV sets, bicycles, machinery and equipment, other capital goods, industrial sheds; services like educational fees, medical fees and so on are now financed with the help of such credit. However, unlike in other countries, the emphasis in India is on the provision of installment credit for productive goods and services rather than for purely consumer goods.

Other suppliers of hire-purchase finance are retail and wholesale traders, commercial banks, IDBI, ICICI, NSIC, NSIDC, SFCS, SIDCS, Agro-Industries Corporations (AICs), and so on.

In the recent past, banks also have increased their business in the field of installment credit and consumer loans.

IDBI indirectly participates in financing hire purchase business by way of rediscounting usance bills/promissory notes arising out of sales of indigenous machinery on deferred payment basis.

Lease Finance Companies

A lease is a form of financing employed to acquire the use of assets, through which firms can acquire the economic use of assets for a stated period without owning them. Every lease involves two parties: the user of the asset is known as the lessee, and the owner of the asset is known as the lessor. While these companies may undertake other activities like consumer credit, car finance, etc. their predominant activity is leasing.

Lease financing organizations in India include many private sector non-bank financial companies, some private sector manufacturing companies, Infrastructure Leasing and Financial Services Ltd. (IL&FS), ICICI, IRCI, capital market subsidiaries of leading nationalized banks, IFC, LIC, GIC, Housing Development Finance Corporation (HDFC), certain SIDCs and SIICs, and other organizations. The lessee companies include many leading corporations in both public and private sectors, and small manufacturing companies.

Housing Finance Companies

Housing finance is provided in the form of mortgage loans i.e. it is provided against the security of immovable property of land and buildings. Basically, housing finance loans are given by the Housing and Urban Development Corporation (HUDCO), the apex Co-operative Housing Finance Societies and Housing Boards in different States, Central and State Governments, LIC, Commercial banks, GIC and a few private housing finance companies and nidhis. The Governments provide direct loans mainly to their employees. The participation of commercial and urban co-operative banks in direct mortgage loans has been marginal till recently. LIC has been a major supplier of mortgage loans in indirect and direct forms. It has been giving loans to the State Governments, apex Co-operative Housing Finance Societies, HUDCO, and so on. In addition, it has been providing mortgage loans directly to individuals under its various mortgage schemes.

National Housing Bank

It was set up in July, 1988 as an apex level housing finance institution as a wholly owned subsidiary of the RBI. It began its operations with the total capital of Rs.170 crore (Rs.100 crore as share capital, Rs.50 crore as long-term loan from the RBI, and Rs.20 crore through the sale of bonds). In September, 1989, its share capital was raised to Rs.150 crore. During 1989-90, it issued its second series of bonds whose total subscription amounted to Rs.60 crore. These bonds are guaranteed by the Central Government, and carry an interest rate of 11.5 percent

per annum. The RBI sanctioned it a long-term loan of Rs.25 crore in 1989-90. Further, it can borrow in the USA capital market US$50 million under the USAID Government Guarantee Program. Thus, the resources base of NHB has been made quite strong.

The explicit and primary aim of NHB is to promote housing finance institutions at local and regional levels in the private and joint sectors by providing financial and other support. It refinances housing loans under its refinance schemes for scheduled commercial and co-operative banks, housing finance companies, apex co-operative housing finance societies, and so on.

Venture Capital Funding Companies

The term "venture capital", suggests taking risk in supplying capital. However, supply of risk capital may not be a prime function in certain cases; the emphasis may be on supporting technocrats in setting up projects or on portfolio management.

The term venture capital fund is usually used to denote mutual funds or institutional investors that provide equity finance or risk capital to little known, unregistered, highly risky, young, small private businesses, especially in technology-oriented and knowledge-intensive businesses or industries which have long development cycles and which usually do not have access to conventional sources of capital because of the absence of suitable collateral and the presence of high risk. VCFs play an important role in supplying management and marketing expertise to such units.

SUMMARY

- The economic development of a country depends on the progress of its various economic units, namely the Corporate Sector, Government Sector and the Household Sector.
- The role of the financial sector can be broadly classified into the savings function, policy function and credit function.
- The main types of financial markets are: money market, capital market, forex market and credit market.
- The financial markets are further sub-divided into the Primary market and the Secondary market.
- A market is considered perfect if all the players are price takers, there are no significant regulations on the transfer of funds and transaction costs, if any, are very low.
- The accounting equation Assets = Liabilities, can be altered as
  Financial Assets + Real Assets = Financial Liabilities + Savings.
- The main types of financial assets are deposits, stocks and debt.
- While designing a financial instrument, the issuer must keep the following in mind: cash flows required, taxation rules, leverage expected, dilution of control facts, transaction costs to be incurred, quantum of funds sought, maturity of plan required, prevalent market conditions, investor profile targeted, past performance of issues, cost of funds to be borne, regulatory aspects to abide by.
- While investing in a financial instrument, the investor must keep the following in mind: risk involved, liquidity of the instrument, returns expected, possible tax planning, cash flows required and simplicity of investment.
- Various financial intermediaries came into existence to facilitate a proper channel for investment. The main ones are: stock exchanges, investment bankers, underwriters, registrars, depositories, custodians, primary dealers, satellite dealers and forex dealers.

Chapter III

Time Value of Money

After reading this chapter, you will be conversant with:

- Introduction to the Concept of Time Value
- Process of Compounding
- Process of Discounting
- Future Value of a Single Flow
- Future Value of Multiple Flows
- Future Value of Annuity
- Present Value of a Single Flow
- Present Value of Uneven Multiple Flows
- Present Value of Annuity

INTRODUCTION TO THE CONCEPT OF TIME VALUE

To keep pace with the increasing competition, companies have to go in for new ideas implemented through new projects be it for expansion, diversification or modernization. A project is an activity that involves investing a sum of money now in anticipation of benefits spread over a period of time in the future. How do we determine whether the project is financially viable or not? Our immediate response to this question will be to sum up the benefits accruing over the future period and compare the total value of the benefits with the initial investment. If the aggregate value of the benefits exceeds the initial investment, the project is considered to be financially viable.

While this approach *prima facie* appears to be satisfactory, we must be aware of an important assumption that underlies. We have assumed that irrespective of the time when money is invested or received, the value of money remains the same. Put differently, we have assumed that: value of one rupee now = value of one rupee at the end of year 1 = value of one rupee at the end of year 2 and so on. We know intuitively that this assumption is incorrect because money has time value. How do we define this time value of money and build it into the cash flows of a project? The answer to this question forms the subject matter of this chapter.

We intuitively know that Rs.1,000 in hand now is more valuable than Rs.1,000 receivable after a year. In other words, we will not part with Rs.1,000 now in return for a firm assurance that the same sum will be repaid after a year. But we might part with Rs.1,000 now if we are assured that something more than Rs.1,000 will be paid at the end of the first year. This additional compensation required for parting with Rs.1,000 now is called 'interest' or the time value of money. Normally, interest is expressed in terms of percentage per annum for example, 12 percent p.a. or 18 percent p.a. and so on.

Why should money have time value? Here are some important reasons for this phenomenon:

Money can be employed productively to generate real returns. For instance, if a sum of Rs.100 invested in raw material and labor results in finished goods worth Rs.105, we can say that the investment of Rs.100 has earned a rate of return of 5 percent.

In an inflationary period, a rupee today has a higher purchasing power than a rupee in the future.

Since future is characterized by uncertainty, individuals prefer current consumption to future consumption.

The manner in which these three determinants combine to determine the rate of interest can be symbolically represented as follows:

Nominal or market interest rate

= Real rate of interest or return + Expected rate of inflation

+ Risk premiums to compensate for uncertainty

There are two methods by which the time value of money can be taken care of – compounding and discounting. To understand the basic ideas underlying these two methods, let us consider a project which involves an immediate outflow of say Rs.1,000 and the following pattern of inflows:

Year 1: Rs.250

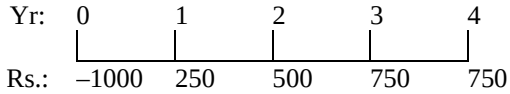
Year 2: Rs.500

Year 3: Rs.750

Year 4: Rs.750

The initial outflow and the subsequent inflows can be represented on a time line as given below:

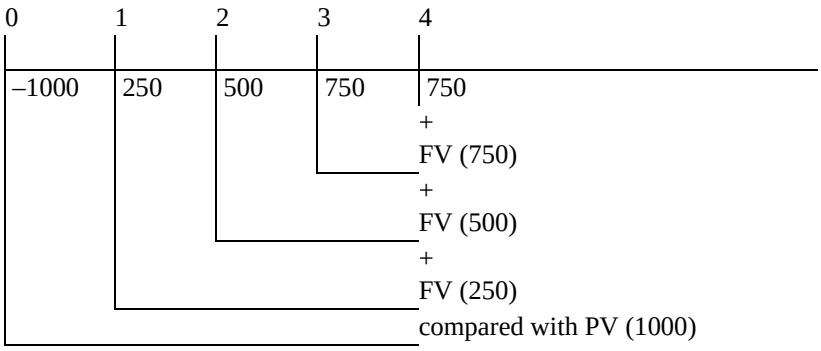
Figure 3.1: Time Line



PROCESS OF COMPOUNDING

Under the method of compounding, we find the Future Values (FV) of all the cash flows at the end of the time horizon at a particular rate of interest. Therefore, in this case we will be comparing the future value of the initial outflow of Rs.1,000 as at the end of year 4 with the sum of the future values of the yearly cash inflows at the end of year 4. This process can be schematically represented as follows:

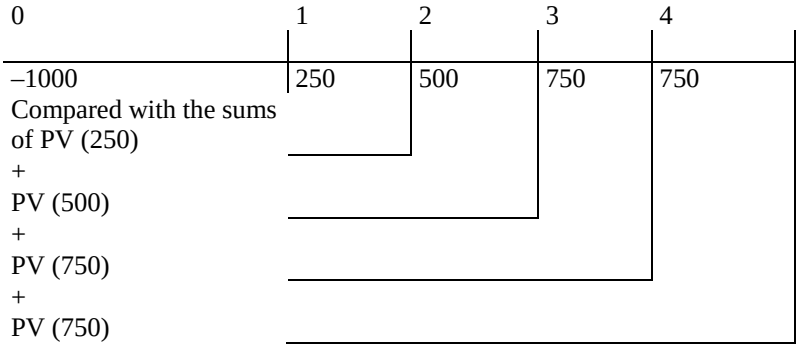
Figure 3.2: Process of Compounding



PROCESS OF DISCOUNTING

Under the method of discounting, we reckon the time value of money now i.e. at time 0 on the time line. So, we will be comparing the initial outflow with the sum of the Present Values (PV) of the future inflows at a given rate of interest. This process can be diagrammatically represented as follows:

Figure 3.3: Process of Discounting



How do we compute the future values and the present values? This question is answered in the latter part of the chapter. But before that, we must draw the distinction between the concepts of compound interest and simple interest. We shall illustrate this distinction through the following illustration.

Illustration 3.1

If X has a sum of Rs.1,000 to be invested, and there are two schemes, one offering a rate of interest of 10 percent, compounded annually, and other offering a simple rate of interest of 10 percent, which one should he opt for assuming that he will withdraw the amount at the end of (a) one year (b) two years, and (c) five years?

Solution

Given the initial investment of Rs.1,000, the accumulations under the two schemes will be as follows:

End of year	Compounded Interest Scheme	Simple Interest Scheme
1	1000 + (1000 x 0.10) = 1100	1000 + (1000 x 0.10) = 1100
2	1100 + (1100 x 0.10) = 1210	1100 + (1000 x 0.10) = 1200
3	1210 + (1210 x 0.10) = 1331	1200 + (1000 x 0.10) = 1300
4	1331 + (1331 x 0.10) = 1464	1300 + (1000 x 0.10) = 1400
5	1464 + (1464 x 0.10) = 1610	1400 + (1000 x 0.10) = 1500

From this table, it is clear that under the compound interest scheme interest earns interest, whereas interest does not earn any additional interest under the simple interest scheme. Obviously, an investor seeking to maximize returns will opt for the compound interest scheme if his holding period is more than a year. We have drawn the distinction between compound interest and simple interest here to emphasize that in financial analysis we always assume interest to be compounded.

FUTURE VALUE OF A SINGLE FLOW (LUMP SUM)

The above table illustrates the process of determining the future value of a lump sum amount invested at one point of time. But the way it has gone about calculating the future value will prove to be cumbersome if the future value over long maturity periods of 20 years or 30 years is to be calculated. A generalized procedure for calculating the future value of a single cash flow compounded annually is as follows:

$$FV_n = PV(1 + k)^n$$

Where, FV_n = Future value of the initial flow n years hence

PV = Initial cash flow

k = Annual rate of interest

n = Life of investment

In the above formula, the expression $(1 + k)^n$ represents the future value of an initial investment of Re.1 (one rupee invested today) at the end of n years at a rate of interest k referred to as Future Value Interest Factor (FVIF, hereafter). To simplify calculations, this expression has been evaluated for various combinations of k and n and these values are presented in Table 1 at the end of this book. To calculate the future value of any investment for a given value of 'k' and 'n', the corresponding value of $(1 + k)^n$ from the table has to be multiplied with the initial investment.

Illustration 3.2

The fixed deposit scheme of Andhra Bank offers the following interest rates.

Period of Deposit	Rate per Annum
46 days to 179 days	10.0%
180 days to < 1 year	10.5%
1 year and above	11.0%

An amount of Rs.10,000 invested today will grow in 3 years to

$FV_n = PV(1 + k)^n$

= PV x FVIF (11,3)

= 10,000 (1.368)

= Rs.13,680

Doubling Period

A frequent question posed by the investor is, ''How long will it take for the amount invested to be doubled for a given rate of interest''. This question can be answered by a rule known as 'rule of 72'. Though it is a crude way of calculating, this rule says that the period within which the amount will be doubled is obtained by dividing 72 by the rate of interest.

For instance, if the given rate of interest is 6 percent, then doubling period is 72/6 = 12 yrs.

However, an accurate way of calculating doubling period is the 'rule of 69', according to which, doubling period

$$= 0.35 + \frac{69}{\text{Interest rate}}$$

Illustration 3.3

The following is the calculation of doubling period for two rates of interest i.e., 6 percent and 12 percent.

Rate of interest	Doubling Period
6%	0.35 + 69/6
	= 0.35 + 11.5 = 11.85 yrs.
12%	0.35 + 69/12
	= 0.35 + 5.75 = 6.1 yrs.

Growth Rate

The compound rate of growth for a given series after a period of time can be calculated by employing the Future Value Interest Factor Table (FVIF).

Illustration 3.4

Years	1	2	3	4	5	6
Profits (in lakh)	95	105	140	160	165	170

How is the compound rate of growth for the above series determined? This can be done in two steps:

a. The ratio of profits for year 6 to year 1 is to be determined i.e., 170/95 = 1.79.

b. The $FVIF_{K\,(n-1)}$ table is to be looked at. Look at a value which is close to 1.79 for the row for 5 years.

   The value close to 1.79 is 1.762 and the interest rate corresponding to this is 12 percent. Therefore, the compound rate of growth is 12 percent.

Increased Frequency of Compounding

In the above illustration, the compounding has been done annually. Suppose we are offered a scheme where compounding is done more frequently. For example, assume you have deposited Rs.10,000 in a bank which offers 10 percent interest per annum compounded semi-annually which means that interest is paid every six months.

		Rs.
Now, amount in the beginning	=	10,000
Interest @ 10 percent p.a. for first six months $\left(10{,}000 \times \frac{0.1}{2}\right)$	=	500
Amount at the end of six months	=	10,500
Interest for second 6 months $\left(10{,}500 \times \frac{0.1}{2}\right)$	=	525
Amount at the end of the year	=	11,025

Instead, if the compounding is done annually, the amount at the end of the year will be 10,000 (1 + 0.1) = Rs.11,000. This difference of Rs.25 is because under semi-annual compounding, the interest for first 6 months earns interest in the second 6 months.

The generalized formula for these shorter compounding periods is

$$FV_n = PV\left(1+\frac{k}{m}\right)^{m \times n}$$

Where, FV_n = Future value after 'n' years
PV = Cash flow today
k = Nominal interest rate per annum
m = Number of times compounding is done during a year
n = Number of years for which compounding is done.

Illustration 3.5

Under the Vijaya Cash Certificate scheme of Vijaya Bank, deposits can be made for periods ranging from 6 months to 10 years. Every quarter, interest will be added on to the principal. The rate of interest applied is 9 percent p.a. for periods from 12 to 23 months and 10 percent p.a. for periods from 24 to 120 months.

An amount of Rs.1,000 invested for 2 years will grow to

$$FV_n = PV\left(1+\frac{k}{m}\right)^{m \times n}$$

Where, m = frequency of compounding during a year

$$= 1{,}000\left(1+\frac{0.10}{4}\right)^{8}$$

$$= 1{,}000(1.025)^{8}$$

= 1,000 x 1.2184 = Rs.1,218

Effective vs. Nominal Rate of Interest

We have seen above that the accumulation under the semi-annual compounding scheme exceeds the accumulation under the annual compounding scheme by Rs.25. This means that while under annual compounding scheme, the nominal rate of interest is 10 percent per annum, under the scheme where compounding is done semi-annually, the principal amount grows at the rate of 10.25 percent per annum. This 10.25 percent is called the effective rate of interest which is the rate of interest per annum under annual compounding that produces the same effect as that produced by an interest rate of 10 percent under semi-annual compounding.

The general relationship between the effective and nominal rates of interest is as follows:

$$r = \left(1+\frac{k}{m}\right)^{m} - 1$$

Where, r = Effective rate of interest
k = Nominal rate of interest
m = Frequency of compounding per year

Illustration 3.6

Find out the effective rate of interest, if the nominal rate of interest is 12 percent and interest is quarterly compounded.

Effective rate of interest

$$r = \left(1+\frac{k}{m}\right)^{m} - 1$$

$$r = \left(1+\frac{0.12}{4}\right)^{4} - 1$$

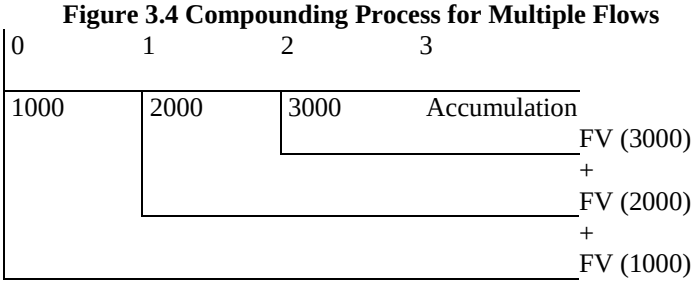
$= (1 + 0.03)^4 - 1 = 1.126 - 1$

$= 0.126 = 12.6\%$ p.a.

FUTURE VALUE OF MULTIPLE FLOWS

Suppose we invest Rs.1,000 now (beginning of year 1), Rs.2,000 at the beginning of year 2 and Rs.3,000 at the beginning of year 3, how much will these flows accumulate to at the end of year 3 at a rate of interest of 12 percent per annum? This problem can be represented on the time line as follows:

Figure 3.4 Compounding Process for Multiple Flows



To determine the accumulated sum at the end of year 3, we have to just add the future compounded values of Rs.1,000, Rs.2,000 and Rs.3,000 respectively[1]

FV (Rs.1,000) + FV (Rs.2,000) + FV (Rs.3,000)

At k = 0.12, the above sum is equal to

= Rs.1,000 x $FVIF_{(12,3)}$ + 2,000 x $FVIF_{(12,2)}$ + 3,000 x $FVIF_{(12,1)}$

= Rs.[(1,000 x 1.405) + (2,000 x 1.254) + (3,000 x 1.120)] = Rs.7,273

Therefore, to determine the accumulation of multiple flows as at the end of a specified time horizon, we have to find out the accumulations of each of these flows using the appropriate FVIF and sum up these accumulations. This process can get tedious if we have to determine the accumulation of multiple flows over a long period of time, for example, the accumulation of a recurring deposit of Rs.100 per month for 60 months at a rate of 1 percent per month. In such cases a short cut method can be employed provided the flows are of equal amounts. This method is discussed in the following section.

FUTURE VALUE OF ANNUITY

Annuity is the term used to describe a series of periodic flows of equal amounts. These flows can be either receipts or payments. For example, if you are required to pay Rs.200 per annum as life insurance premium for the next 20 years, you can classify this stream of payments as an annuity. If the equal amounts of cash flow occur at the end of each period over the specified time horizon, then this stream of cash flows is defined as a regular annuity or deferred annuity. When cash flows occur at the beginning of each period the annuity is known as an annuity due.

The future value of a regular annuity for a period of n years at a rate of interest 'k' is given by the formula:

$FVA_n = A(1 + k)^{n-1} + A(1 + k)^{n-2} + A(1 + k)^{n-3} + ..+A$

which reduces to

$$FVA_n = A\left[\frac{(1+k)^n - 1}{k}\right]$$

Where, A = Amount deposited/invested at the end of every year for n years

k = Rate of interest (expressed in decimals)

n = Time horizon

FVA_n = Accumulation at the end of n years.

1 Candidates who would like to know whether there is any short cut for evaluating $(1 + k)^n$ for values of 'k' not found in the table, are informed that there is no short cut method except using logarithms or the X^Y function found in scientific calculators.

The expression $\left[\frac{(1+k)^n - 1}{k}\right]$ is called the Future Value Interest Factor for Annuity (FVIFA, hereafter) and it represents the accumulation of Re.1 invested or paid at the end of every year for a period of n years at the rate of interest 'k'. As in the case of the future value of a single flow, this expression has also been evaluated for different combinations of 'k' and 'n' and tabulated in Table 2 at the end of this book. So, given the annuity payment, we have to just multiply it with the appropriate FVIFA value and determine the accumulation.

Illustration 3.7

Under the recurring deposit scheme of the Vijaya Bank, a fixed sum is deposited every month on or before the due date opted for 12 to 120 months according to the convenience and needs of the investor. The period of deposit, however, should be in multiples of 3 months only. The rate of interest applied is 9 percent p.a. for periods from 12 to 24 months and 10 percent p.a. for periods from 24 to 120 months and is compounded at quarterly intervals.

Based on the above information the maturity value of a monthly installment of Rs.5 for 12 months can be calculated as below:

Amount of deposit = Rs.5 per month

Rate of interest = 9 percent p.a. compounded quarterly

Effective rate of interest per annum

$$= \left(1 + \frac{0.09}{4}\right)^4 - 1 = 0.0931$$

Rate of interest per month

$$= (r + 1)^{1/m} - 1$$

$$= (1 + 0.0931)^{1/12} - 1$$

$$= 1.0074 - 1 = 0.0074 = 0.74\%$$

Maturity value can be calculated using the formula

$$FVA_n = A\left\{\frac{(1+k)^n - 1}{k}\right\}$$

$$= 5\left\{\frac{(1 + 0.0074)^{12} - 1}{0.0074}\right\}$$

$$= 5 \times 12.50 = Rs.62.50$$

If the payments are made at the beginning of every year, then the value of such an annuity called annuity due is found by modifying the formula for annuity regular as follows:

$FVA_n(due) = A\ (1 + k)\ FVIFA_{k,n}$

Illustration 3.8

Under the Jeevan Mitra Plan offered by Life Insurance Corporation of India, if a person is insured for Rs.10,000 and if he survives the full term, then the maturity benefits will be the basic sum of Rs.10,000 assured plus bonus which accrues on the basic sum assured. The minimum and maximum age to propose for a policy is 18 and 50 years respectively.

Let us take two examples, one of a person aged 20 and another of 40 years old to illustrate this scheme.

The person aged 20, enters the plan for a policy of Rs.10,000. The term of policy is 25 years and the annual premium is Rs.41.65. The person aged 40, also proposes for the policy of Rs.10,000 and for 25 years and the annual premium he has to pay comes to Rs.57. What are the rates of return enjoyed by these two persons?

Rate of return enjoyed by the person of 20 years of age

Premium = Rs.41.65 per annum

Term of Policy = 25 years

Maturity Value = Rs.10,000 + bonus which can be overlooked as it is a fixed amount and does not vary with the term of policy.

We know that the premium amount when multiplied by FVIFA factor will give us the value at maturity.

i.e. P x (1 + k) FVIFA (k,n) = MV

Where, P = Annual premium

n = Term of policy in years

k = Rate of return

MV = Maturity value

Therefore, 41.65 x (1 + k) FVIFA (k,25) = 10,000

(1 + k) FVIFA (k,25) = 240.1

From table 2 at the end of the book, we can find that

(1 + 0.14) FVIFA (14,25) = 207.33

i.e. (1.14) FVIFA (14,25) = 1.14 x 181.871 = 207.33

and

(1 + 0.15) FVIFA (15,25) = 244.71

i.e. (1.15) FVIFA (15,25) = 1.15 x 212.793 = 244.71

By interpolation

$$k = 14\% + (15\% - 14\%) \times \frac{240.1 - 207.33}{244.71 - 207.33}$$

$$= 14\% + 1 \times \frac{32.77}{37.38}$$

$$= 14\% + 0.87\% = 14.87\%$$

Rate of return enjoyed by the person aged 40

Premium = Rs.57 per annum

Term of Policy = 25 years

Maturity Value = Rs.10,000

Therefore, 57 x (1 + k) FVIFA (k,25) = 10,000

(1 + k) FVIFA (k,25) = 175.44

From table 2 at the end of the book, we can find that

(1 + k) FVIFA (13%, 25) = 175.85

i.e. (1.13) (155.62) = 175.85

i.e. k = 13% (appr.)

Here we find that the rate of return enjoyed by the 20-year old person is greater than that of the 40-year old person by about 2 percent in spite of the latter paying a higher amount of annual premium for the same period of 25 years and for the same maturity value of Rs.10,000. This is due to the coverage for the greater risk in the case of the 40-year old person.

Now that we are familiar with the computation of future value, we will get into the mechanics of computation of present value.

Sinking Fund Factor

We have the equation

$$FVA = A\left[\frac{(1+k)^n - 1}{k}\right]$$

We can rewrite it as

$$A = FVA\left[\frac{k}{(1+k)^n - 1}\right]$$

The expression $\left[\frac{k}{(1+k)^n - 1}\right]$ is called the Sinking Fund Factor. It represents the amount that has to be invested at the end of every year for a period of "n" years at the rate of interest "k", in order to accumulate Re.1 at the end of the period.

PRESENT VALUE OF A SINGLE FLOW

Discounting as explained earlier is an alternative approach for reckoning the time value of money. Using this approach, we can determine the present value of a future cash flow or a stream of future cash flows. The present value approach is the commonly followed approach for evaluating the financial viability of projects.

If we invest Rs.1,000 today at 10 percent rate of interest for a period of 5 years, we know that we will get Rs.1,000 x FVIF (10,5) = Rs.1,000 x 1.611 = Rs.1,611 at the end of 5 years. The sum of Rs.1,611 is called the accumulation of Rs.1,000 for the given values of 'k' and 'n'. Conversely, the sum of Rs.1,000 invested today to get Rs.1,611 at the end of 5 years is called the present value of Rs.1,611 for the given values of 'k' and 'n'. It, therefore, follows that to determine the present value of a future sum we have to divide the future sum by the FVIF value corresponding to the given values of 'k' and 'n' i.e. present value of Rs.1,611 receivable at the end of 5 years at 10 percent rate of interest.

$$= \text{Rs. } \frac{1611}{FVIF(10,5)} = \text{Rs. } \frac{1611}{1.611} = \text{Rs.1,000}$$

In general the present value (PV) of a sum (FV_n) receivable after n years at a rate of interest (k) is given by the expression.

$$PV = \frac{FV_n}{FVIF(k,n)} = \frac{FV_n}{(1+k)^n}$$

The inverse of FVIF (k,n) is defined as PVIF (k,n) (Present Value Interest Factor for k,n). Therefore, the above equation can be written as

$$PV = FV_n \text{ x } PVIF(k,n)$$

Therefore to determine the present value of a future sum, we have to just locate the PVIF factor for the given values of k and n and multiply this factor value with the given sum. Since PVIF (k,n) represents the present value of Re.1 receivable after n years at a rate of interest k, it is obvious that PVIF values cannot be greater than one. The PVIF values for different combinations of k and n are given in table 3 at the end of this book.

Illustration 3.9

The cash certificates of Andhra Bank is a term deposit scheme under reinvestment plan. Interest on deposit money earns interest as it is reinvested at quarterly rests. These deposits suit depositors from lower and middle income groups, since the small odd sums invested grow into large amounts over a period of time.

Given an interest rate of 12 percent p.a. on a certificate having a value of Rs.100 after 1 year, the issue price of the cash certificate can be calculated as below.

The effective rate of interest has to be calculated first.

$$r = \left(1 + \frac{k}{m}\right)^{m} - 1$$

$$r = \left(1 + \frac{0.12}{4}\right)^{4} - 1 = 12.55\%$$

The issue price of the cash certificate is

$$PV = \frac{FV_n}{(1 + k)^n}$$

$$= \frac{100}{(1 + 0.1255)^1} = \text{Rs.}88.85$$

Illustration 3.10

Pragati cash certificate scheme of Syndicate Bank is an ideal scheme for all classes of people under different income groups. A small odd sum can be invested for a period ranging from 1 to 10 years. The certificates are issued in convenient denominations of Rs.25, Rs.100, Rs.1,000, and Rs.1,00,000. The rate of interest is 12 percent p.a. compounded quarterly.

To calculate the issue price of a certificate of Rs.1,00,000 to be received after 10 years, the following formula can be used

$$PV = \frac{FV_n}{(1 + k)^n}$$

Firstly, the effective rate of interest has to be calculated.

$$r = \left(1 + \frac{0.12}{4}\right)^{4} - 1 = 12.55\%$$

The issue price of the cash certificate can now be calculated as:

$$PV = \frac{FV_n}{(1 + k)^n}$$

$$= \frac{1,00,000}{(1 + 0.1255)^{10}} = \text{Rs.}30,658$$

PRESENT VALUE OF UNEVEN MULTIPLE FLOWS

Suppose a project involves an initial investment of Rs.10 lakh and generates net inflows as follows:

End of Year → 1 Rs.2 lakh

→ 2 Rs.4 lakh

→ 3 Rs.6 lakh

What is the present value of the future cash inflows? To determine it, we have to first define the relevant rate of interest. The relevant rate of interest as we shall see later, will be the cost of the funds invested. Suppose, we assume that this cost is 12 percent p.a. then we can determine the present value of the cash flows using the following two-step procedure:

Step 1

Evaluate the present value of cash inflow independently. In this case, the present values will be as follows:

Year	Cash Flow (Rs. In lakh)	Present Value (Rs. in lakh)
1	2	2 x PVIF (12,1) = 2 x 0.893 = 1.79
2	4	4 x PVIF (12,2)= 4 x 0.797 = 3.19
3	6	6 x PVIF (12,3)= 6 x 0.712 = 4.27

Step 2

Aggregate the present values obtained in Step 1 to determine the present value of the cash flow stream. In this case the present value of the cash inflows associated with the project will be Rs.(1.79 + 3.19 + 4.27) lakh = Rs.9.25 lakh.

A project is said to be financially viable if the present value of the cash inflows exceeds the present value of the cash outflow. In this case, the project is not financially viable because the present value of the net cash inflows (Rs.9.25 lakh) is less than the initial investment of Rs.10 lakh. The difference of Rs.0.75 lakh is called the net present value.

Like the procedure followed to obtain the future value of multiple cash flows, the procedure adopted to determine the present value of a series of future cash flows can prove to be cumbersome, if the time horizon to be considered is quite long. These calculations can, however, be simplified if the cash flows occurring at the end of the time periods are equal. In other words, if the stream of cash flows can be regarded as a regular annuity or annuity due, then the present value of this annuity can be determined using an expression similar to the FVIFA expression.

PRESENT VALUE OF AN ANNUITY

The present value of an annuity 'A' receivable at the end of every year for a period of n years at a rate of interest k is equal to

$$PVA_n = \frac{A}{(1+k)} + \frac{A}{(1+k)^2} + \frac{A}{(1+k)^3} + ... + \frac{A}{(1+k)^n};$$

which reduces to

$$PVA_n = A \text{ x } \left[\frac{(1+k)^n - 1}{k(1+k)^n} \right]$$

The expression

$$\left(\frac{(1 + k)^n - 1}{k(1 + k)^n} \right)$$

is called the PVIFA (Present Value Interest Factor Annuity) and it represents the present value of a regular annuity of Re.1 for the given values of k and n. The values of PVIFA (k,n) for different combinations of 'k' and 'n' are given in Table 4 given at the end of the book. It must be noted that these values can be used in any present value problem only if the following conditions are satisfied: (a) the cash flows are equal; and (b) the cash flows occur at the end of every year. It must also be noted that PVIFA (k,n) is not the inverse of FVIFA (k,n) although PVIF (k,n) is the inverse of FVIF (k,n). The following illustration illustrates the use of PVIFA tables for determining the present value.

Illustration 3.11

The Swarna Kalash Yojana at rural and semi-urban branches of SBI is a scheme open to all individuals/firms. A lump sum deposit is remitted and the principal is received with interest at the rate of 12 percent p.a. in 12 or 24 monthly installments. The interest is compounded at quarterly intervals.

The amount of initial deposit to receive a monthly installment of Rs.100 for 12 months can be calculated as below:

Firstly, the effective rate of interest per annum has to be calculated.

$$r = \left(1+\frac{k}{m}\right)^{m} - 1$$

$$= \left(1+\frac{0.12}{4}\right)^{4} - 1 = 12.55\%$$

After calculating the effective rate of interest per annum, the effective rate of interest per month has to be calculated which is nothing but

$(1.1255)^{1/12} - 1 = 0.00990$

The initial deposit can now be calculated as below:

$$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$$

$$= 100\left[\frac{(1+0.00990)^{12} - 1}{0.00990\,(1+0.00990)^{12}}\right]$$

$$= 100\left[\frac{0.1255}{0.01114}\right]$$

$= 100 \times 11.26 = Rs.1,126.$

Illustration 3.12

The annuity deposit scheme of SBI provides for fixed monthly income for suitable periods of the depositor's choice. An initial deposit has to be made for a minimum period of 36 months. After the first month of the deposit, the depositor receives monthly installments depending on the number of months he has chosen as annuity period. The rate of interest is 11 percent p.a. which is compounded at quarterly intervals.

If an initial deposit of Rs.4,610 is made for an annuity period of 60 months, the value of the monthly annuity can be calculated as below.

Firstly, the effective rate of interest per annum has to be calculated

$$r = \left(1+\frac{k}{m}\right)^{m} - 1$$

$$= \left(1+\frac{0.11}{4}\right)^{4} - 1 = 11.46\%$$

After calculating the effective rate of interest per annum, the effective rate of interest per month has to be calculated which is nothing but

$(1.1146)^{1/12} - 1 = 0.00908$

The monthly annuity can now be calculated as

$$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$$

$$4,610 = A\left[\frac{(1+0.00908)^{60} - 1}{0.00908\,(1.00908)^{60}}\right]$$

$$4,610 = A \times \frac{0.7200}{0.0156} = 99.88333$$

$$\Rightarrow A = 99.8833$$

$$A = Rs.100$$

Capital Recovery Factor

Manipulating the relationship between PVA_n, A, k & n we get an equation:

$$A = PVA_n \left[\frac{k(1+k)^n}{(1+k)^n - 1} \right]$$

$\left[\frac{k(1+k)^n}{(1+k)^n - 1} \right]$ is known as the capital recovery factor.

Illustration 3.13

A loan of Rs.1,00,000 is to be repaid in five equal annual installments. If the loan carries a rate of interest of 14 percent p.a. the amount of each installment can be calculated as below.

If R is defined as the equated annual installment, we are given that

$$R \times PVIFA\ (14\%, 5) = Rs.1,00,000$$

$$\text{Therefore, } R = \frac{Rs.1,00,000}{PVIFA\ (14\%, 5)}$$

$$= \frac{Rs.1,00,000}{3.433} = Rs.29,129$$

Notes:

1. We have introduced in this example the application of the inverse of the PVIFA factor which is called the capital recovery factor. The application of the capital recovery factor helps in answering questions like:
   - What should be the amount paid annually to liquidate a loan over a specified period at a given rate of interest?
   - How much can be withdrawn periodically for a certain length of time, if a given amount is invested today?
2. In this example, the amount of Rs.29,129 represents the sum of the principal and interest components. To get an idea of the break-up of each installment between the principal and interest components, the loan repayment schedule is given below:

Year (A)	Equated annual installment (B) (Rs.)	Interest content of (B) (C) (Rs.)	Capital content of (B) [(D) = (B – C)] (Rs.)	Loan outstanding after payment (E) (Rs.)
0	–	–	–	1,00,000
1	29,129	14,000	15,129	84,871
2	29,129	11,882	17,247	67,624
3	29,129	9,467	19,662	47,962
4	29,129	6,715	22,414	25,548
5	29,129	3,577	25,552	–

The interest content of each installment is obtained by multiplying interest rate with the loan outstanding at the end of the immediately preceding year.

As can be observed from this schedule, the interest component declines over a period of time whereas the capital component increases. The loan outstanding at the end of the penultimate year must be equal to the capital content of the last installment but in practice there will be a marginal difference on account of rounding-off errors.

3. The equated annual installment method is usually adopted for fixing the loan repayment schedule in a hire purchase transaction. But the financial institutions in India like IDBI, IFCI and ICICI do not follow this scheme of equal periodic amortization. Instead, they stipulate that the loan must be repaid in equal installments. According to this scheme, the principal component of each payment remains constant and the total debt-servicing burden (consisting of principal repayment and interest payment) declines over time.

Present Value of Perpetuity

An annuity of an infinite duration is known as perpetuity. The present value of such perpetuity can be expressed as follows:

$$P_\infty = A \times PVIFA_{k,\infty}$$

Where, P_∞ = Present value of a perpetuity

A = Constant annual payment

$PVIFA_{k,\infty}$ = Present value interest factor for a perpetuity

$\therefore$ The value of $PVIFA_{k,\infty}$ is

$$\sum_{t=1}^{\infty} \frac{1}{(1+k)^t} = \frac{1}{k}$$

We can say that PV interest factor of a perpetuity is simply one divided by interest rate expressed in decimal form. Hence, PV of a perpetuity is simply equal to the constant annual payment divided by the interest rate.

Students who are interested in knowing the derivation of the formulae for PVIFA and FVIFA may refer the Appendix to this chapter.

SUMMARY

- Inflation, uncertainty and opportunity cost – whatever the reason, money has time value. A rupee today is certainly more valuable than a rupee a year hence, the difference usually represented by ‘interest’. Therefore, two cash flows occurring at different points of time are not comparable. Compounding and discounting are two methods used to take care of time value of money. Discounting involves determining the present values of all the future cash flows so that they are comparable to the initial outflow. The rate of interest usually employed is the cost of capital of the firm.

Appendix

Formulae for future value and present value of Annuity.

The derivation of the formulae for the future value and present value of an annuity makes use of the following symbols.

Symbols used in FVIFA and PVIFA Formulae

A = constant periodic flow

K = interest rate per period

n = duration of the annuity

FVA_n = future value of a regular annuity with a duration of n time periods

PVA_n = present value of a regular annuity with a duration of n time periods.

FUTURE VALUE OF AN ANNUITY

In terms of the symbols defined above, the future value of a regular annuity can be expressed as follows:

$FVA_n = A\ (1 + k)^{n-1} + A\ (1 + k)^{n-2} + ... + A$ ...(1)

Multiplying equation (1) by (1 + k) on both sides,

we get $FVA_n\ (1 + k) = A(1 + k)^n +$

$A(1 + k)^{n-1} + ...+ A(1 + k)$ ...(2)

Subtracting equation (1) from equation (2), we get

$FVA_n\ k = A(1 + k)^n - A$

or $FVA_n\ k = A\ [(1 + k)^n - 1]$

$$\text{i.e. } FVA_n = A\left[\frac{(1 + k)^n - 1}{k}\right]$$

If the annuity is not a regular annuity but is an annuity due – annuity where cash flows occur at the beginning of each period – the future value can be obtained as follows:

$FVA_n = A\ (1 + k)^n + A(1 + k)^{n-1} + ...+ A\ (1 + k)$ ...(3)

Dividing equation (3) by (1 + k) on both sides, we get

$$\frac{FVA_n}{(1+k)} = A\ (1 + k)^{n-1} + A(1 + k)^{n-2} + ...+ A \quad ...(4)$$

Subtracting equation (4) from equation (3) we get

$$\left[1 - \frac{1}{1 + k}\right] FVA_n = A\ (1 + k)^n - A$$

$$\text{i.e. } \frac{k}{1 + k}\ FVA_n = A\ [(1 + k)^n - 1]$$

$$FVA_n = A\left[\frac{(1 + k)^n - 1}{k}\right](1 + k)$$

Therefore, the future value of an annuity due can be expressed as the product of the future value of a regular annuity and the factor (1 + k).

PRESENT VALUE OF AN ANNUITY

The present value of a regular annuity can be represented in terms of the symbols defined in the table as follows:

$$PVA_n = \frac{A}{(1+k)} + \frac{A}{(1+k)^2} + ...+ \frac{A}{(1+k)^n} \quad \ldots(5)$$

Multiplying equation (5) by (1 + k) on both sides, we get

$$PVA_n\,(1+k) = A + \frac{A}{(1+k)} + ...+ \frac{A}{(1+k)^{n-1}} \quad ...(6)$$

Subtracting equation (5) from equation (6), we get

$$PVA_{n,k} = A - \frac{A}{(1+k)^n}$$

$$= A\left[1 - \frac{1}{(1+k)^n}\right]$$

$$= A\left[\frac{(1+k)^n - 1}{(1+k)^n}\right]$$

$$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$$

The present value of an annuity due can be expressed as follows:

$$PVA_n = A + \frac{A}{(1+k)} + \frac{A}{(1+k)^2} + ...+ \frac{A}{(1+k)^{n-1}} \quad ...(7)$$

Multiplying equation (7) by $\frac{1}{(1+k)}$ on both sides, we get

$$\frac{PVA_n}{(1+k)} = \frac{A}{(1+k)} + \frac{A}{(1+k)^2} + ... + \frac{A}{(1+k)^n} \quad \ldots(8)$$

Subtracting equation (8) from equation (7), we get

$$PVA_n\left[1 - \frac{1}{1+k}\right] = A - \frac{A}{(1+k)^n}$$

i.e. $$PVA_n\left[\frac{k}{1+k}\right] = A\left[\frac{(1+k)^n - 1}{(1+k)^n}\right]$$

i.e. $$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right](1+k)$$

Thus, we find that the present value of an annuity due is equal to the product of the present value of a regular annuity and the factor (1 + k).

Chapter IV

Risk and Return

After reading this chapter, you will be conversant with:

- The Concepts of Risk and Return
- Measuring of Rate of Return
- Sources of Risk
- Portfolio and Risk
  - Diversifiable and Non-diversifiable Risk
- Capital Asset Pricing Model

As discussed in the first chapter, while making the decisions regarding investment and financing, the finance manager seeks to achieve the right balance between risk and return, in order to optimize the value of the firm. Return and risk go together in investments. Everything an investor (be it the firm or the investors in the firm) does is tied directly or indirectly to return and risk. Let us now examine these concepts of risk and return in greater detail.

THE CONCEPTS OF RETURN

The objective of any investor is to maximize expected returns from his investments, subject to various constraints, primarily risk. Return is the motivating force, inspiring the investor in the form of rewards, for undertaking the investment. The importance of returns in any investment decision can be traced to the following factors:

- It enables investors to compare alternative investments in terms of what they have to offer the investor.
- Measurement of historical (past) returns enables the investors to assess how well they have done.
- Measurement of historical returns also helps in estimation of future returns.

This reveals that there are two types of returns – Realized or Historical Return and Expected Return.

Realized Return

This is ex-post (after the fact) return, or return that was or could have been earned. For example, a deposit of Rs.1,000 in a bank on January 1, at a stated annual interest rate of 10% will be worth Rs.1,100 exactly a year later. The historical or realized return in this case is 10%.

Expected Return

This is the return from an asset that investors anticipate or expect to earn over some future period. The expected return is subject to uncertainty, or risk, and may or may not occur. The investor compensates for the uncertainty in returns and the timing of those returns by requiring an expected return that is sufficiently high to offset the risk or uncertainty.

The Components of Return

What constitutes the return on any investment? Return is basically made up of two components:

- The periodic cash receipts or income on the investment in the form of interest, dividends, etc. The term yield is often used in connection with this component of return. Yield refers to the income derived from a security in relation to its price, usually its purchase price. For example, the yield on a 10% bond at a purchase price of Rs.900 is 11.11%.
- The appreciation (depreciation) in the price of the asset is referred to as capital gain (loss). This is the difference between the purchase price and the price at which the asset can be sold.

Many investors have capital gains as their primary objective and expect this component to be larger than the income component.

MEASURING THE RATE OF RETURN

The rate of return is the total return the investor receives during the holding period (the period when the security is owned or held by the investor) stated as a percentage of the purchase price of the investment at the beginning of the holding period. In other words, it is the income from the security in the form of cash flows and the difference in price of the security between the beginning and end of the holding period expressed as a percentage of the purchase price of the security at the beginning of the holding period.

The general equation for calculating the rate of return is shown below:

$$k = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$$

Where, k = Rate of return

P_t = Price of the security at time 't' i.e. at the and of the holding period.

P_{t-1} = Price of the security at time 't–1' i.e. at the beginning of the holding period or purchase price.

D_t = Income or cash flows receivable from the security at time 't'.

Rates of return are usually stated at an annual percentage rate to allow comparison of returns between securities. Let us first look at the calculation of the rates of return of an equity stock and then a bond.

A stock's rate of return

What are the two components of return from shares? The first component "D_t" is the income in cash from dividends and the second component is the price change (appreciation and depreciation).

Illustration 4.1

If a share of ACC is purchased for Rs.3,580 on February 8 of last year, and sold for Rs.3,800 on February 9 of this year and the company paid a dividend of Rs.35 for the year, how do we calculate the rate of return?

$$k = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}} = \frac{35 + (3,800 - 3,580)}{3,580} = 7.12\%$$

Rate of Return of a Bond (Debenture)

In the case of bonds, instead of dividends, the investor is entitled to payments of interest annually or semi-annually, based on the coupon rate. The investor also benefits if there is an appreciation in the price of the bond.

Illustration 4.2

If a 14%, Rs.1,000 ICICI debenture was purchased for Rs.1,350 and the price of this security rises to Rs.1,500 by the end of an year. Rate of return for this debenture would be

$$\frac{140 + (1,500 - 1,350)}{1,350} = 21.48\%.$$

Probabilities and Rates of Return

What are probabilities? A probability is a number that describes the chances of an event taking place. Probabilities are governed by five rules and range from 0 to 1.

- A probability can never be larger than 1 (In other words maximum probability of an event taking place is 100%).
- The sum total of probabilities must be equal to 1.
- A probability can never be a negative number.
- If an outcome is certain to occur, it is assigned a probability of 1, while impossible outcomes are assigned a probability of 0.
- The possible outcomes must be mutually exclusive and collectively exhaustive.

How does probability affect the rate of return? In a world of uncertainty, the expected return may or may not **materialize**. In such a situation, **the expected rate of return for any asset is the weighted average rate of return using the probability of each rate of return as the weight**. The expected rate of return "k"

is calculated by summing the products of the rates of return and their respective probabilities. This can be mathematically stated as follows:

$$\bar{k} = \sum_{i=1}^{n} P_i \, k_i$$

Where, $\bar{k}$ = expected rate of return.

P_i = probability associated with the ith possible outcome.

k_i = rate of return from the ith possible outcome.

n = number of possible outcomes.

Illustration 4.3

The probability distributions and corresponding rates of return for Alpha Company are shown below.

Possible Outcomes (i)	Probability of Occurrence (P_i)	Rate of Return (%) (K_i)
1	0.10	50
2	0.20	30
3	0.40	10
4	0.20	–10
5	0.10	–30
	1.00	

How do we calculate the expected rate of return?

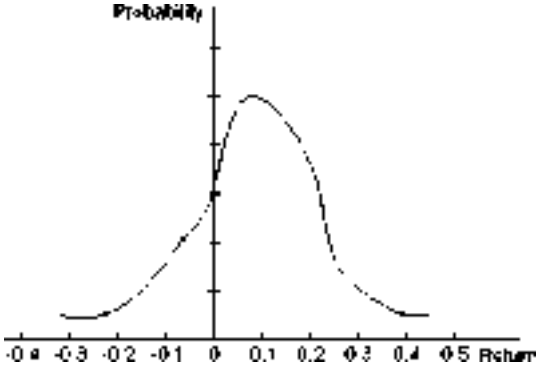
$$k = \bar{k} = \sum_{i=1}^{n} P_i \, k_i$$

$$= (0.10)(0.50) + (0.20)(0.30) + (0.40)(0.10) + (0.20)(-0.10) + (0.10)(-0.30)$$

$$= 0.05 + 0.06 + 0.04 - 0.02 - 0.03 = 0.1$$

$$= 10\%$$

Figure 4.1: Probability Distribution of Alpha's Rate of Return



RISK

Risk and return go hand in hand in investments and finance. One cannot talk about returns without talking about risk, because, investment decisions always involve a trade-off between risk and return. Risk can be defined as **the chance that the actual outcome from an investment will differ from the expected outcome**. This means that, the more variable the possible outcomes that can occur (i.e., the broader the range of possible outcomes), the greater the risk.

RISK AND EXPECTED RATE OF RETURN

The width of a probability distribution of rates of return is a measure of risk. The wider the probability distribution, the greater is the risk or greater the variability of return the greater is the variance. This variance can be appraised visually. Take a look at the probability distribution of Alpha company in comparison with the probability distributions of the rates of return of two other companies Beta and Gamma.

Beta Company

	P_i	K_i(%)
1	0.05	38
2	0.20	23
3	0.50	8
4	0.20	–7
5	0.05	–22
	1.00	

$\bar{k}$ = 8%

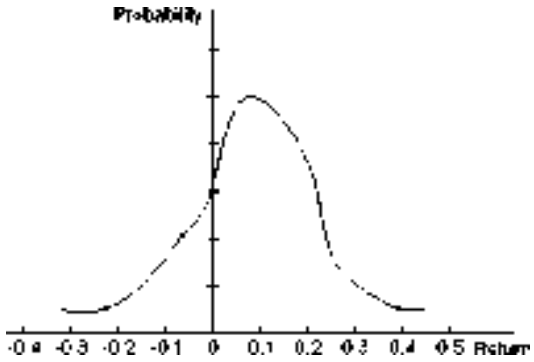
Gamma Company

	P_i	K_i(%)
1	0.10	90
2	0.25	50
3	0.30	20
4	0.25	–10
5	0.10	–50
	1.00	

$\bar{k}$ = 20%

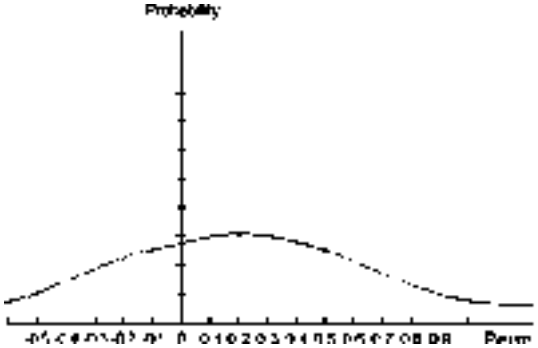
Beta Company

Figure 4.2



Gamma Company

Figure 4.3



Of the three companies, Gamma company seems to be the riskiest because its probability distribution is the widest and Beta company is the least risky because its probability distribution is the narrowest. If we look more closely, we also see

that the expected return of Gamma company is the highest at 20% while that of Beta company is at 8%. This substantiates the fact that an investor cannot expect greater returns without being willing to assume greater risks.

SOURCES OF RISK

What are the various sources of risk? What are the factors which make any financial asset risky? Let us take a look at some of the general sources of risk.

- **Interest Rate Risk:** Interest rate risk is the variability in a security's return resulting from changes in the level of interest rates. Other things being equal, security prices move inversely to interest rates. The reason for this is related to the valuation of securities which will be discussed in the next chapter. This risk affects bondholders more directly than equity investors.
- **Market Risk:** Market risk refers to the variability of returns due to fluctuations in the securities market. All securities are exposed to market risk but equity shares get the most affected. This risk includes a wide range of factors exogenous to securities themselves like depressions, wars, politics, etc.
- **Inflation Risk:** With rise in inflation there is reduction of purchasing power, hence this is also referred to as purchasing power risk and affects all securities. This risk is also directly related to interest rate risk, as interest rates go up with inflation.
- **Business Risk:** This refers to the risk of doing business in a particular industry or environment and it gets transferred to the investors who invest in the business or company.
- **Financial Risk:** Financial risk arises when companies resort to financial leverage or the use of debt financing. The more the company resorts to debt financing, the greater is the financial risk. This risk is further discussed in Chapter VIII on Leverage.
- **Liquidity Risk:** This risk is associated with the secondary market in which the particular security is traded. A security which can be bought or sold quickly without significant price concession is considered liquid. The greater the uncertainty about the time element and the price concession, the greater the liquidity risk. Securities which have ready markets like treasury bills have lesser liquidity risk.

Measurement of Total Risk

Risk is associated with the dispersion in the likely outcomes. Dispersion refers to variability. If an asset's return has no variability, it has no risk. An investor analyzing a series of returns on an investment over a period of years needs to know something about the variability of its returns or in other words the asset's total risk.

There are different ways to measure variability of returns. The **range** of the returns, i.e. the difference between the highest possible rate of return and the lowest possible rate of return is one measure, but the range is based on only two extreme values.

The **variance** of an asset's rate of return can be found as the sum of the squared deviation of each possible rate of return from the expected rate of return multiplied by the probability that the rate of return occurs.

$$VAR(k) = \sum_{i=1}^{n} P_i (k_i - \bar{k})^2$$

Where, VAR (k) = Variance of returns

P_i = Probability associated with the ith possible outcome

k_i = Rate of return from the ith possible outcome

$\bar{k}$ = Expected rate of return

n = Number of years.

A third and most popular way of measuring variability of returns is standard deviation. The standard deviation denoted by σ is simply the square root of the variance of the rates of return explained above.

$$\sigma = \sqrt{VAR(k)} = \left[\sum_{i=1}^{n} P_i (k_i - \bar{k})^2\right]^{1/2}$$

The standard deviation and variance are conceptually equivalent quantitative measures of total risk. Standard deviation is preferred to range because of the following advantages:

- Unlike the range, standard deviation considers every possible event and assigns each event a weight equal to its probability.
- Standard deviation is a very familiar concept and many calculators and computers are programmed to calculate it.
- Standard deviation is a measure of dispersion around the expected (or average) value. This is in absolute consensus with the definition of risk as "variability of returns".
- Standard deviation is obtained as the square root of the sum of squared differences multiplied by their probabilities. This facilitates comparison of risk as measured by standard deviation and expected returns as both are measured in the same costs. This is why standard deviation is preferred to variance as a measure of risk.

Calculating the Standard Deviation

Let us calculate the σ for Alpha Company's rates of return.

Possible Outcomes	k_i(%)	$k_i - \bar{k}$	$(k_i - \bar{k})^2$	P_i	$P_i (k_i - \bar{k})^2$
1	50	40	1600	0.10	160
2	30	20	400	0.20	80
3	10	0	0	0.40	0
4	–10	–20	400	0.20	80
5	–30	–40	1600	0.10	160
					$\sum P_i (k_i - \bar{k})^2 = 480$

$$\sigma = \left[\sum_{i=1}^{n} P_i (k_i - \bar{k})^2\right]^{1/2}$$

$$= \sqrt{480} = 21.9\%$$

Similarly, find out the standard deviation of the rates of return of Beta Company and Gamma Company. You will see that Gamma Company with a σ of 38% is the riskiest of the three. Does this correspond with our ranking based on the width of probability distributions?

PORTFOLIOS AND RISK

What is a portfolio? An investment portfolio refers to the group of assets that is owned by an investor. It is possible to construct a portfolio in such a way that the total risk of the portfolio is less than the sum of the risk of the individual assets taken together. Generally, investing in a single security is riskier than investing in a portfolio, because the returns to the investor are based on the future of a single asset. Hence, in order to reduce risk, investors hold a diversified portfolio which might contain equity capital, bonds, real estate, savings accounts, bullion, collectibles and various other assets. In other words, the investor does not put all his eggs into one basket.

How does diversification reduce risk? Let us take a look at a very simple illustration.

Illustration 4.4

Let us assume you put your money equally into the stocks of two companies Banlight Limited, a manufacturer of sunglasses and Varsha Limited, a

manufacturer of rain coats. If the monsoons are above average in a particular year, the earnings of Varsha Limited would be up leading to an increase in its share price and returns to shareholders. On the other hand, the earnings of Banlight would be on the decline, leading to a corresponding decline in the share prices and investor's returns. If there is a prolonged summer the situation would be just the opposite.

While the return on each individual stock might vary quite a bit depending on the weather, the return on your portfolio (50% Banlight and 50% Varsha stocks) could be quite stable because the decline in one will be offset by the increase in the other. In fact, at least in theory, the offsetting could eliminate your risk entirely.

The table below gives the returns on the two stocks on the assumption that rainy, normal and sunny weather are equally likely events (1/3 probability each). Let us calculate the expected return and standard deviation of the two stocks individually and of the portfolio of 50% Banlight and 50% Varsha stocks.

Weather Conditions	Return on Banlight Stock	Return on Varsha Stock	Return on Portfolio (50% Banlight + 50% Varsha)
	R_B(%)	R_V(%)	R_p(%)
Rainy	0	20	10
Normal	10	10	10
Sunny	20	0	10

Possible Outcomes	Probabilities	R_B	R_V	R_p
Rainy	1/3	0	20	10
Normal	1/3	10	10	10
Sunny	1/3	20	0	10
Expected Rate of Return $\bar{k}$		10%	10%	10%
σ		$\sqrt{66.67}$ = 8.16%	$\sqrt{66.67}$ = 8.16%	$\sqrt{0}$ = 0%

Note that the portfolio earns 10% no matter what the weather is. Hence through diversification, two risky stocks have been combined to make a riskless portfolio as is evidenced by the standard deviation of the portfolio.

While the above hypothetical example served us in understanding the benefits of diversification, in practice one rarely if ever, finds stocks which can perfectly offset each other. The returns on Banlight and Varsha are said to be **perfectly negatively correlated** since they always move in opposite directions in exactly the same manner. On the other hand, two stocks which go up or down together in the same manner are said to be **perfectly positively correlated**. Both these types of correlation rarely happen in practice. In general, all stocks have some degree of positive correlation because certain variables like economic factors, political climate, etc. tend to affect all stocks.

We need not have stocks which are perfectly negatively correlated in a portfolio in order to achieve the benefit of risk reduction through diversification. As long as the assets in a portfolio are not perfectly positively correlated, diversification does result in risk reduction.

The risk reduction effects of diversification are important both to financial managers and investors. The finance managers' attempt is to maximize the market value, which is what the investors are interested in.

Diversifiable and Non-diversifiable Risk

The fact that returns on stocks do not move in perfect tandem means that risk can be reduced by diversification. But the fact that there is some positive correlation

means that in practice risk can never be reduced to zero. So, there is a limit on the amount of risk that can be reduced through diversification. This can be traced to two major reasons.

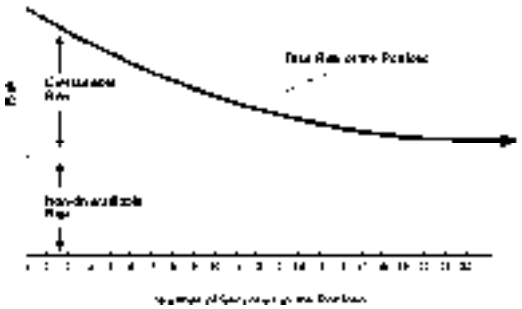
DEGREE OF CORRELATION

As we have been saying, the amount of risk reduction depends on the degree of positive correlation between stocks. The lower the degree of positive correlation, the greater is the amount of risk reduction that is possible.

THE NUMBER OF STOCKS IN THE PORTFOLIO

The amount of risk reduction achieved by diversification also depends on the number of stocks in the portfolio. As the number of stocks increases, the diversifying effect of each additional stock diminishes as shown in the figure below:

Figure 4.4: Risk Reduction Through Diversification



As the figure indicates, the major benefits of diversification are obtained with the first 10 to 12 stocks, provided they are drawn from industries that are not closely related. Additions to the portfolio beyond this point continue to reduce total risk but the benefits are diminishing.

From the figure it is also apparent that it is the **diversifiable** risk that is being reduced unlike the **non-diversifiable** risk which remains constant whatever your portfolio is. What are diversifiable and non-diversifiable risks? The risk of any individual stock can be separated into two components: non-diversifiable and diversifiable risk.

Non-diversifiable risk is that part of total risk (from various sources like interest rate risk, inflation risk, financial risk, etc.) that is related to the general economy or the stock market as a whole and hence cannot be eliminated by diversification. Non-diversifiable risk is also referred to as market risk or systematic risk.

Diversifiable risk on the other hand, is that part of total risk that is specific to the company or industry and hence can be eliminated by diversification. Diversifiable risk is also called unsystematic risk or specific risk.

Let us take a look at some of the factors that give rise to diversifiable and non-diversifiable risk.

NON-DIVERSIFIABLE OR MARKET RISK FACTORS

- Major changes in tax rates
- War & other calamities
- An increase or decrease in inflation rates
- A change in economic policy
- Industrial recession
- An increase in international oil prices, etc.

Diversifiable or Specific Risk Factors

- Company strike
- Bankruptcy of a major supplier

- Death of a key company officer
- Unexpected entry of new competitor into the market etc.

Risk of Stocks in a Portfolio

How do we measure the risk of stocks in a portfolio? We can think of a portfolio's standard deviation as a good indicator of its risk to the extent that if addition of a stock to the portfolio increases the portfolio's standard deviation, the stock adds risk to the portfolio. But the risk that a stock adds to a portfolio will depend not only on the stock's total risk, its standard deviation, but on how that risk breaks down into diversifiable and non-diversifiable risk. If an investor holds only one stock, there is no question of diversification, and his risk is therefore, the standard deviation of the stock. For a diversified investor, the risk of a stock is only that portion of the total risk that cannot be diversified away or its non-diversifiable risk. How does one measure non-diversifiable or market risk? It is generally measured by Beta (β) coefficient. Beta measures the relative risk associated with any individual portfolio as measured in relation to the risk of the market portfolio. The market portfolio represents the most diversified portfolio of risky assets an investor could buy since it includes all risky assets. This relative risk can be expressed as:

$$\beta_j = \frac{\text{Non-diversifiable risk of asset or portfolio j}}{\text{Risk of market portfolio}}$$

Thus, the beta coefficient is a measure of the non-diversifiable or systematic risk of an asset relative to that of the market portfolio. A beta of 1.0 indicates an asset of average risk. A beta coefficient greater than 1.0 indicates above-average risk – stocks whose returns tend to be more risky than the market. Stocks with beta coefficients less than 1.0 are of below average risk i.e., less riskier than the market portfolio. An important point to note here is that in the case of the market portfolio, all the possible diversification has been done – thus the risk of the market portfolio is non-diversifiable which an investor cannot avoid. Similarly, as long as the asset's returns are not perfectly positively correlated with returns from other assets, there will be some way to diversify away its unsystematic risk. As a result beta depends only on non-diversifiable risks.

The beta of a portfolio is nothing but the weighted average of the betas of the securities that constitute the portfolio, the weights being the proportions of investments in the respective securities. For example, if the beta of a security A is 1.5 and that of security B is 0.9 and 60% and 40% of our portfolio is invested in the 2 securities respectively, the beta of our portfolio will be 1.26 (1.5 x 0.6 + 0.9 x 0.4).

Measurement of Beta

The systematic relationship between the return on the security or a portfolio and the return on the market can be described using a simple linear regression, identifying the return on a security or portfolio as the dependent variable k_j and the return on market portfolio as the independent variable k_m, in the single-index model or market model developed by William Sharpe. This can be expressed as:

$$k_j = \alpha_j + \beta_j k_m + e_j$$

The beta parameter β_j in the model represents the slope of the above regression relationship and as explained earlier, measures the responsiveness of the security or portfolio to the general market and indicates how extensively the return of the portfolio or security will vary with changes in the market return. The beta coefficient of a security is defined as the ratio of the security's covariance of return with the market to the variance of the market. This can be calculated as follows:

$\bar{k}_j = 20$

$\bar{k}_m = 10$

$$\beta_j = \frac{Cov(k_j\, k_m)}{Var(k_m)} = \frac{\sum P\left(k_j - \bar{k}_j\right)\left(k_m - \bar{k}_m\right)}{\sum P\left(k_m - \bar{k}_m\right)^2}$$

$$= \frac{740}{480} = 1.54$$

$$\alpha = \bar{k}_j - \beta_j \bar{k}_m$$

$$= 20 - (1.54 \times 10) = 4.6\%$$

The alpha parameter α is the intercept of the fitted line and indicates what the return of the security or portfolio will be when the market return is zero. For example, a security with an α of + 2 percent would earn 2 percent even when the market return was zero and would earn an additional 2 percent at all levels of market return. The converse is true if a security has α of –2 percent. The positive α thus represents a sort of bonus return and would be a highly desirable aspect of a portfolio or security while a negative α represents a penalty to the investor.

The third term e_j is the unexpected return resulting from influences not identified by the model. Frequently referred to as random or residual return, it may take on any value but is generally found to average out to zero.

Let us try to understand the above concepts of β and α with the help of an illustration.

Illustration 4.5

Year	k_j	$k_i - \bar{k}_j$	k_m	$k_m - \bar{k}_m$	P	$P\left(k_j - \bar{k}_j\right) x \left(k_m - \bar{k}_m\right)$	$P\left(k_m - \bar{k}_m\right)^2$
1	20	0	10	0	0.1	0	0
2	50	30	30	20	0.1	60	40
3	–50	–70	–30	–40	0.1	280	160
4	–10	–30	–10	–20	0.1	60	40
5	90	70	50	40	0.1	280	160
6	20	0	10	0	0.1	0	0
7	–10	–30	10	0	0.1	0	0
8	20	0	10	0	0.1	0	0
9	20	0	–10	–20	0.1	0	40
10	50	30	30	20	0.1	60	40
					1.0	740	480

What do these figures of β and α imply? When we say that the security has a β of 1.54 we mean that if the return on the market portfolio rises by 10%, the return on the security 'j' will rise by 15.4%. An α of 4.6% implies that the security earns 4.6% over and above the market rate of return.

Characteristic Regression Line (CRL)

The CRL is a graphic representation of the market model.

$$k_j = \alpha_j + \beta_j k_m + e_j$$

Try and chart the CRL for Security j with a β of 1.54 and an α of 4.6%.

THE CAPITAL ASSET PRICING MODEL (CAPM)

The CAPM developed by William F Sharpe, John Lintner and Jan Mossin is one of the major developments in financial theory. The CAPM establishes a linear

relationship between the required rate of return of a security and its systematic or undiversifiable risk or beta.

The CAPM is represented mathematically by

$$k_j = R_f + B_j (k_m - R_f)$$

Where,

k_j = expected or required rate of return on security j

R_f = risk-free rate of return

B_j = beta coefficient of security j

k_m = return on market portfolio

Assumptions

The CAPM is based on a list of critical assumptions, some of which are as follows:

- Investors are risk-averse and use the expected rate of return and standard deviation of return as appropriate measures of risk and return for their portfolio. In other words, the greater the perceived risk of a portfolio, the higher return a risk-averse investor expects to compensate the risk.
- Investors make their investment decisions based on a single-period horizon i.e., the next immediate time period.
- Transaction costs in financial markets are low enough to ignore and assets can be bought and sold in any unit desired. The investor is limited only by his wealth and the price of the asset.
- Taxes do not affect the choice of buying assets.
- All individuals assume that they can buy assets at the going market price and they all agree on the nature of the return and risk associated with each investment.

The assumptions listed above are somewhat limiting but the CAPM enables us to be much more precise about how trade-offs between risk and return are determined in financial markets.

In the CAPM, the expected rate of return can also be thought of as a required rate of return because the market is assumed to be in equilibrium. The expected return as we have explained earlier is the return from an asset that investors anticipate or expect to earn over some future period. The required rate of return for a security is defined as the minimum expected rate of return needed to induce an investor to purchase it.

What do investors require (expect) when they invest? First of all, investors can earn a riskless rate of return by investing in riskless assets like treasury bills. This risk-free rate of return is designated R_f and the minimum return expected by the investors. In addition to this, because investors are risk-averse, they will expect a risk premium to compensate them for the additional risk assumed in investing in a risky asset.

Required Rate of Return = Risk-free rate + Risk premium.

The CAPM provides an explicit measure of the risk premium. It is the product of the Beta for a particular security j and the market risk premium $k_m - R_f$

$$\text{Risk premium} = \beta_j (k_m - R_f)$$

This beta coefficient 'β_j' is the non-diversifiable risk of the asset relative to the risk of the market. If the risk of the asset is greater than the market risk, i.e. β exceeds 1.0, the investor assigns a higher risk premium to asset j than to the market. For example, suppose a fertilizer company had a β_j of 1.5, that its required rate of return on the market (k_m) was 15 percent per year and that its risk-

free interest rate (R_f) was 6 percent per annum. Using the CAPM the required rate of return can be calculated as below:

$$k_j = R_f + \beta_j (k_m - R_f)$$

$$= 0.06 + 1.5 (0.15 - 0.06)$$

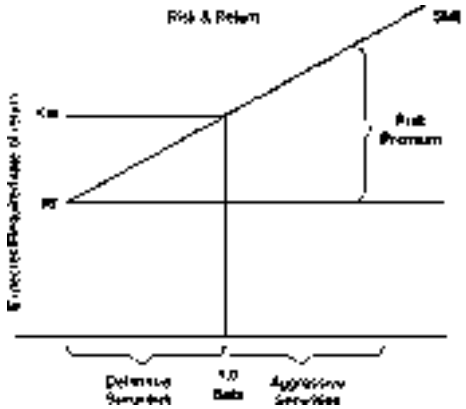
$$= 0.195 \text{ or } 19.5\%$$

The above calculations show that the required rate of return on this stock would be 19.5% – the sum of 6 percent risk-free return and a 13.5 percent risk premium. This 19.5 percent is larger than the 15 percent required return on the market because the fertilizer stock is riskier than the market.

The Security Market Line (SML)

We can plot the relationship between the required rate of return (k_j) and non-diversifiable risk (beta) as expressed in CAPM to produce a graph of the SML as shown below:

Figure 4.5



As per the CAPM assumptions, any individual security's expected return and beta statistics should lie on the SML. The SML intersects the vertical axis at the risk-free rate of return R_f and $k_m - R_f$ is the slope of the SML.

Since all securities are expected to plot along the SML, the line provides a direct and convenient way of determining the expected/required return of a security if we know the beta of the security. The SML can also be used to classify securities. Those with betas greater than 1.00 and plotting on the upper part of the SML are classified as aggressive securities while those with betas less than 1.00 and plotting on the lower part of the SML can be classified as defensive securities which earn below-average returns.

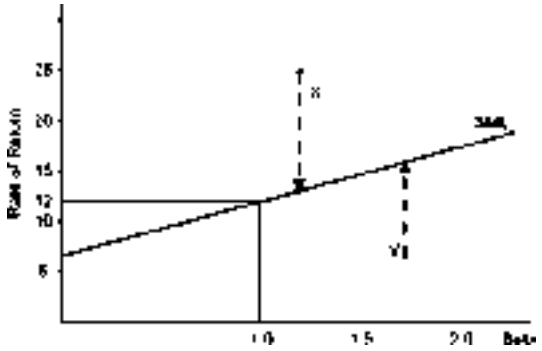
From the data given in the following table, chart the SML and classify the securities.

	Expected Return	Risk-free Return	Beta	Market-risk premium
Market	12.0	5	1.00	7
Security A	?	5	1.20	?
Security B	?	5	0.80	?

One of the major assumptions of the CAPM is that the market is in equilibrium and that the expected rate of return is equal to the required rate of return for a given level of market risk or beta. In other words, the SML provides a framework for evaluating whether high-risk stocks are offering returns more or less in proportion to their risk and vice-versa. Let us see how we can appraise the value securities using CAPM, and the SML.

Once a security's expected rate of return and beta have been computed, they may be plotted with reference to the SML. If the security's expected rate of return differs from the required rate of return, the security may be over or under priced and may fall below or above the SML. Let us clarify with the help of the figure below:

Figure 4.6



From the figure we see that R_f = 6% and k_m = 12%.

T

wo securities X and Y have been shown in the figure. Both X and Y should have been on the SML but obviously are not. Why? Let us take the case of X first. The expected rate of return of X is around 25%. But at a beta of around 1.2, using the SML we see that the required rate of return need be only around 13%. This tells us that security X is undervalued or priced too low because its average rate of return is inappropriately high for the level of risk it bears. On the other hand security Y with a beta of around 1.7 requires a rate of return of around 16% but its expected return is only about 7%. This tells us that the asset is over valued or overpriced and hence unattractive because it is expected to produce a return lower than stocks with similar betas. These two assets should move toward their equilibrium – required return positions on the SML (i.e., expected rate of return should be equal to required rate of return and correspond to their respective betas). The expected return as we know is computed as below:

$$\text{Expected return } \bar{k} = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$$

$$= \frac{\text{Expected Income}}{\text{Market Purchase Price}}$$

While estimating the expected return a year hence, in the absence of historic data on returns and probabilities, the following formula which is derived from the basic formula given above may be used.

$$\text{Expected Return} = \frac{D_o\,(1+g)}{P_o} + g$$

Where, D_o = Last paid dividend

P_o = Current purchase/market price

g = Growth rate

The derivation of this formula is explained in detail in the chapter on Valuation of Securities.

To reach equilibrium and their required rate of return positions on the SML, both stocks have to go through a temporary price adjustment. In order to reach equilibrium, assuming betas remain the same, the expected return of X has to be brought down to be equal to the required rate of return and be plotted on the SML. To accomplish this, the denominator of the above formula namely the purchase price has to be sufficiently increased. Similarly, for security Y, the purchase price

has to be sufficiently reduced so that the expected return rises to be the same as the required rate of return.

Security X

$R_f = 6\%,\ \beta_x = 1.2,\ k_m = 12\%$

Required rate of return $= R_f + \beta_x\ (k_m - R_f)$

$= 6 + 1.2\ (12 - 6)$

$= 13.2\%$

Expected rate of return a year hence:

Last paid dividend (D_o) = Rs.1.90

Current purchase price (P_o) = Rs.10

Growth rate = 5%

Expected rate of return $= \frac{D_o\ (1+g)}{P_o} + g$

$= \frac{2}{10} + 0.05$

$= 25\%$

By how much should the purchase price of X be increased so that it is at equilibrium? Since at equilibrium, the required rate is equal to the expected rate, this can be solved as follows:

$0.132 = \frac{2.00}{P_o} + 0.05$

$\therefore P_o$ = Rs.24.40

In practice, how does the price of security X get pushed up to its equilibrium price? Investors will be interested in purchasing security X because it offers more than proportionate returns in comparison to the risk. This demand will push up the price of X as more of it is purchased and correspondingly bring down the returns. This process will continue till it reaches the equilibrium price and expected returns are the same as required returns.

Security Y

$R_f = 6\%,\ \beta_y = 1.6,\ k_m = 12\%$

Required rate of return $= R_f + \beta_y\ (k_m - R_f)$

$= 6 + 1.6\ (12 - 6)$

$= 15.6\%$

Expected rate of return a year hence:

Last paid dividend = Rs.1

Current purchase price = Rs.35

Growth rate = 4%

Expected rate of return $= \frac{1.04}{35} + 0.04 = 7\%$

Equilibrium price $= 0.156 = \frac{1.04}{P_o} + 0.04$

= Rs.9.00

Investors will be tempted to sell security Y because it offers less than the required rate of return. This increase in the supply of Y will drive down its price and correspondingly increase the return until the expected return rises enough to reach the SML and the security is once again in equilibrium.

Thus the CAPM provides many useful insights to the finance manager to maximize the value of the firm. It shows the type of risk for which shareholders require

compensation in the form of a higher risk premium, and hence, a higher return. Because finance managers also perform the investment function on behalf of shareholders, they must keep sight of the returns shareholders expect for taking risks.

SUMMARY

- The risk associated with a common stock is interpreted in terms of the variability of its return. The most common measures of riskiness of security are standard deviation and variance of returns.
- Unsystematic risk is the extent of the variability in the security's return on account of the firm specific risk factors. This is also called diversifiable or avoidable risk factors.
- Systematic risk refers to factors which affect the entire market and hence the firm too. This is also called non-diversifiable risk.
- If a portflio is well diversified, the unsystematic risk gets almost eliminated. The non-diversifiable risk arising from the wide movements of security prices in the market is very important to an investor. The modern portfolio theory defines the riskiness of a security as its vulnerability to market risk. This vulnerability is measured by the sensitivity of the return of the security vis-á-vis the market return and is called beta.
- The concept of security market line is developed by the modern portfolio theory. SML represents the average or normal trade-off between risk and return for a group of securities. Here the risk is measured typically in terms of the beta values.
- The ex post SML is used to evaluate the performance of portfolio manager; tests of asset-pricing theories, such as the CAPM and to conduct tests of market efficiency.
- The ex ante SML is used to identify undervalued securities and determine the consensus, price of risk implicit in the current market prices.
- Depending upon the value of alpha, using SML it is possible to estimate whether the scrip is underpriced (it is then eligible to be purchased) or overpriced (it is then eligible to be sold).

Chapter V

Valuation of Securities

After reading this chapter, you will be conversant with:

Valuation of Bond
Bond Price Movements
Equity Valuation: Dividend Capitalization Approach
Equity Valuation: Ratio Approach

The ultimate goal of any individual investor or corporates is maximization of profits or rate of return. Investment management is an on-going process which needs to be constantly monitored by way of information as this may affect the value of securities or rate of return of such securities. Therefore, a finance manager needs to have basic knowledge and understanding of the framework of security valuation which is essentially based on conceptual understanding of time value of money and risk-return relationship. While making valuation judgments about securities, the analyst constantly applies a process which may achieve the following.

a. A true picture of a company over a representative time span.
b. An estimation of current normal earning power and dividend pay-out.
c. Estimate of future profitability and growth and the reliability of such expectations.
d. Translation of all these estimates into valuation of the company and its securities.

The concepts of time value of money provide a fundamental background for the valuation of bonds and stocks. This chapter is divided into the following sections.

- Concept of valuation
- Valuation of Bond
- Valuation of Equity: Dividend Capitalization Approach
- Valuation of Equity: Ratio Approach.

CONCEPT OF VALUATION

A security can be regarded simply as a series of dividends or interest payments receivable over a period of time. Therefore, value of any security can be defined as the present value of these future cash streams i.e., the intrinsic value of an asset is equal to the present value of the benefits associated with it. Mathematically, it can be represented as

$$V_0 (\text{or } P_0) = \frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \ldots + \frac{C_n}{(1+k)^n}$$

$$= \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} \quad \ldots\ldots(1)$$

where, V_0 = Value of the asset at time zero
P_0 = Present value of the asset
C_t = Expected cash flow at the end of period t
k = Discount rate or required rate of return on the cash flows
n = Expected life of an asset.

Illustration 5.1

Calculate the value of an asset if the annual cash inflow is Rs.2,000 per year for the next 7 years and the discount rate is 18%.

Solution

The value of an asset can be calculated as:

$$V_0 = \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} = \sum_{t=1}^{7} \frac{2,000}{(1+0.18)^t}$$

$$= \sum_{t=1}^{7} \frac{2,000}{(1+0.18)^t} = 2,000(PVIFA_{18\%,\ 7yrs.})$$

$$= 2,000 \times 3.812 = \text{Rs.}7,624.$$

Concepts of Value

- **Book value** is an accounting concept. Assets are recorded at historical costs and they are depreciated over years. Book value may include intangible assets at acquisition cost minus amortized value. The book value of debt is stated at the outstanding amount. The difference between the book value of assets and liabilities is equal to shareholder's funds or net worth (which is equal to paid-up equity capital plus reserves and surplus).

Replacement value is the amount that a company would be required to spend if it were to replace its existing assets in the current condition.

Liquidation value is the amount that a company can realize if it sells its assets after having terminated its business. It is generally a minimum value which a company may accept if it sells its business.

Going concern value is the amount that a company can realize if it sells its business as an operating one. Its value would always be higher than the liquidation value, the difference accounting for the usefulness of assets and value of intangibles.

Market value of an asset or security is the current price at which the asset or the security is being sold or bought in the market.

VALUATION OF BOND

Bonds are negotiable promissory notes that can be used by individuals, business firms, governments or government agencies. Bonds issued by the government or public sector companies in India are generally secured. Private sector companies may issue secured or unsecured bonds. In case of bond, the rate of interest is fixed and known to investors. A bond is redeemable after a specific period. The expected cash flows consist of annual interest payments plus repayment of principal. Before going into the valuation of bonds, it is necessary to familiarize with certain bond-related terminology.

Face Value

This is the value stated on the face of the bond and is also known as par value. It represents the amount of borrowing by the firm which it specifies to repay after a specific period of time i.e., the time of maturity. A bond is generally issued at face value or par value which is usually Rs.100 and may sometimes be Rs.1,000.

Coupon Rate or Interest

A bond carries a specific rate of interest which is also called the coupon rate. The interest rate payable is simply the product of the par value of the bond and coupon rate.

Maturity

A bond is issued for a specific period of time. It is repaid on maturity. Typically corporate bonds have a maturity period of 7-10 years whereas government bonds have maturity period up to 20-25 years.

Redemption Value

The value which a bondholder gets on maturity is called redemption value. A bond may be redeemed at par, at premium (more than par) or at discount (less than par value).

Market Value

A bond may be traded in a stock exchange. Market value is the price at which the bond is usually bought or sold. Market value may be different from par value or redemption value.

Basic Bond Valuation Model

With the above background it is quite clear that the holder of a bond receives a fixed annual interest payment for a certain number of years and a fixed principal repayment (equal to par value) at the time of maturity. Therefore, the instrinsic value or the present value of bond can now be written as:

$$V_0 \text{ (or } P_0) = \sum_{t=1}^{n} \frac{C_t}{(I + k_d)^t} + \frac{F}{(I + K_d)^n}$$

$$V_0 = I(PVIFA_{k_d, n}) + F(PVIF_{k_d, n}) \quad \text{.....(2)}$$

where, V_0 = Intrinsic value of the bond

P_0 = Present value of the bond

I = Annual interest payable on the bond

F = Principal amount (par value) repayable at the maturity time

n = Maturity period of the bond

k_d = Required rate of return

Illustration 5.2

A bond whose par value is Rs.1,000 bears a coupon rate of 12% and has a maturity period of 3 years. The required rate of return on the bond is 10%. What is the value of this bond?

Solution

Annual interest payable = 1000 x 12% = Rs.120,

Principal repayment at the end of 3 years = Rs.1,000

∴ The value of the bond

V_0 = Rs.120 ($PVIFA_{10\%, 3 \text{ yrs.}}$) + Rs.1,000 ($PVIF_{10\%, 3\text{yrs.}}$)

= Rs.120 x (2.487) + 1,000(0.751)

= Rs.298.44 + Rs.751

= Rs.1,049.44.

Illustration 5.3

Consider the case where an investor purchases a bond whose face value is Rs.1,000, maturity period is 5 years and the nominal (coupon) rate of interest is 7%. The required rate of return is 8%. What should he be willing to pay now to purchase the bond if it matures at par?

Solution

Annual interest payable for 5 years = Rs.70

Principal repayable amount at the end of 5 years = Rs.1,000

∴ The intrinsic value or the present value of the bond

= Rs.70($PVIFA_{8\%, 5\text{yrs.}}$) + Rs.1,000($PVIF_{8\%,5 \text{ yrs.}}$)

= Rs.70 x 3.993 + Rs.1,000 x 0.681

= 279.51 + 681 = Rs.960.51

The above implies that the bond of Rs.1,000 is worth Rs.960.51 today if the required rate of return is 8%. The investor would not be willing to pay more than Rs.960.51 for the bond today.

Bond Values with Semi-Annual Interest

Some of the bonds carry interest payment semi-annually. As half-yearly interest amounts can be reinvested the value of such bonds would be more than the value of the bonds with annual interest payments. Hence, the bond valuation equation can be modified as:

Annual interest payment i.e., I, must be divided by two to obtain interest payment semi-anually.

Number of years to maturity will have to be multiplied by two to get the number of half-yearly periods.

Discount rate has to be divided by two to get the discount rate for half-yearly period.

Thus with the above modifications, the bond valuation equation becomes:

$$V_0 = \sum_{t=1}^{2n} \frac{1/2}{(1+k_d/2)^t} + \frac{F}{(1+K_d/2)^{2n}}$$

$$= I/2\ (PVIFA_{kd/2,2n}) + F(PVIF_{kd/2,\ 2n}) \quad .....(3)$$

where, V = value of the bond

I/2 = semi-annual interest payment

F = par value of the bond payable at maturity

$k_d/2$ = required rate of return for the half-year period

2n = maturity period expressed in half-yearly periods

Illustration 5.4

A bond of Rs.1,000 value carries a coupon rate of 10% and a maturity period of 6 years. Interest is payable semi-annually. If the required rate of return is 12%, calculate the value of the bond.

Solution

$$V_0 = \sum_{t=1}^{12} \frac{100/2}{(1+0.12/2)^t} + \frac{1,000}{(1+0.12/2)^{12}}$$

$$= Rs.50(PVIFA_{6\%,\ 12\ yrs.}) + 1,000(PVIF_{6\%,\ 12yrs.})$$

$$= Rs.50(8.384) + 1,000\ (0.497)$$

$$= Rs.419.2 + 497$$

$$= Rs.916.20$$

Bond-Yield Measures

ONE PERIOD RATE OF RETURN

If a bond is purchased and then sold one year later, its rate of return over this single holding period can be defined as one period rate of return.

$$= \frac{\begin{pmatrix}\text{Price gain or loss}\\ \text{during holding period}\end{pmatrix} + \begin{pmatrix}\text{Coupon interest}\\ \text{if paid}\end{pmatrix}}{\begin{pmatrix}\text{Purchase price at the beginning of}\\ \text{the holding period}\end{pmatrix}} \quad .....(4)$$

The holding period can be calculated on a daily, monthly or annual basis. If the bond price falls by an amount that exceeds coupon interest, the rate of return assumes negative values.

Illustration 5.5

X purchased Rs.1,000 par value bond for Rs.900. The coupon payment on this bond is Rs.80 i.e., 8%. One year later he sells the bond for Rs.800. The rate of return of Mr. X for this one year period is

$$\text{Holding period return} = \frac{(800 - 900) + 80}{900}$$

$$= \frac{-100 + 80}{900}$$

$$= \frac{-20}{900} = -0.0222 \text{ or } 2.22\%$$

Current Yield

Current yield measures the rate of return earned on a bond if it is purchased at its current market price and if the coupon interest is received.

$$\therefore \text{ Current Yield } = \frac{\text{Coupon Interest}}{\text{Current Market Price}} \quad \text{.....(5)}$$

In the example cited above, if the current market price of the bond is also Rs.800, then the

$$\text{Current Yield} = \frac{80}{800} = 0.10, \text{ which can also be expressed as } 10\%$$

Coupon rate and current yield are two different measures. Coupon rate and current yield will be equal if the bond's market price equals its face value.

Yield to Maturity (Ytm)

It is the rate of return earned by an investor who purchases a bond and holds it till maturity. The YTM is the discount rate which equals the present value of promised cash flows to the current market price/purchase price.

Illustration 5.6

Consider a Rs.1,000 par value bond whose current market price is Rs.850. The bond carries a coupon rate of 8% and has a maturity period of 9 years. What would be the rate of return that an investor earns if he purchases the bond and holds till maturity?

Solution

The rate of return earned also referred to as yield to maturity, is the value of k_d in the following equation.

$$P_0 = \sum_{t=1}^{n} \frac{I}{(1+k_d)^t} + \frac{F}{(1+K_d)^n}$$

$$\text{Rs.}850 = \sum_{t=1}^{9} \frac{80}{(1+k_d)^t} + \frac{F}{(1+k_d)^9}$$

$$= \text{Rs.}80\ (\text{PVIFA}_{kd\%,\ 9\ yrs}) + \text{Rs.}1{,}000\ (\text{PVIF}_{kd\%,\ 9\ yrs.})$$

To find out the value of k_d in the above equation, several values of k_d will have to be tried out in order to reach the input value. Therefore, to start, consider a discount rate of 12% for k_d for which the expression becomes equal to

$$\text{Rs.}80(\text{PVIFA}_{12\%,\ 9\ yrs}) + \text{Rs.}1{,}000(\text{PVIF}_{12\%,\ 9\ yrs.})$$

$$= \text{Rs.}80 \times 5.328 + \text{Rs.}1{,}000(0.361)$$

$$= \text{Rs.}426.24 + 361 = \text{Rs.}787.24$$

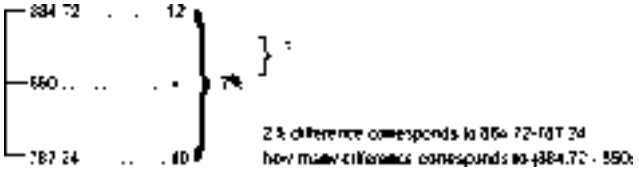
Since, the above value is less than Rs.850, market price, we have to try with a less discounting rate (k_d). So, let k_d = 10%, then the equation becomes:

Rs.80(PVIFA$_{10\%, 9 \text{ yrs.}}$) + Rs.1,000 (PVIF$_{10\%, 9 \text{ yrs.}}$)

= Rs.80 x 5.759 + Rs.1,000 x 0.424

= Rs.460.24 + 424 = Rs.884.72

From the above it is clear that k_d lies between 10% and 12%. Now we have to use linear interpolation in the range of 10% and 12%. We find that k_d is equal to the following:



$$10\% + (12 - 10\%) \times \frac{884.72 - 850}{884.72 - 787.24}$$

$$= 10\% + 2\% \times \frac{34.72}{97.48}$$

$$= 10\% + 2\% \times 0.356$$

$$= 10\% + 0.71$$

$$= 10.71\%$$

$\therefore$ The yield to maturity is 10.71%

An Approximation: As trial and error method calculations are tedious the following approximation formula can be employed to find out the approximate YTM on a bond.

$$YTM \simeq \frac{I + (F - P)/n}{0.4F + 0.6P} \quad \text{or} \quad \frac{I + (F - P)/n}{(F + P)/2} \qquad \text{.....(6)}$$

where, YTM = yield to maturity

I = annual interest payment

F = par value or redemption value of the bond

P = current market price of the bond

N = years to maturity.

Illustration 5.7

The bond of Zeta Industries Ltd. with a par value of Rs.500 is currently traded at Rs.435. The coupon rate is 12% and it has a maturity period of 7 years. What is the yield to maturity.

Solution

$$YTM \simeq \frac{I + (F - P)/n}{0.4F + 0.6P}$$

$$= \frac{60 + (500 - 435)/7}{0.4 \times 500 + 0.6 \times 435}$$

$$= \frac{60 + 9.285}{200 + 261} = \frac{69.285}{461} = .15029 \approx \text{or } 15.03\%$$

BOND VALUE THEOREMS

Based on the bond valuation model, several bond value theorems have been derived which state the effect of the following factors on bond values:

I. Relationship between the required rate of return and the coupon rate.

II. Number of years to maturity.

III. Yield to maturity.

I. The following are the theorems which show the effect on the bond values influenced by the relationship between the required rate of return and the coupon rate.

i. When the required rate of return is equal to the coupon rate, the value of the bond is equal to its par value.

i.e., If k_d = Coupon rate;

then, Value of a Bond = Par value

Illustration 5.8

a. Consider a bond of KenStar Intermediaries Ltd. with the following features:

Par value : Rs.100

Coupon rate : 12%

Years to maturity : 5 years.

Find out the value of KenStar's bond if the required rate of return is 12%.

Solution

If the required rate of return is 12% (same as the coupon rate) the value of the bond is

$$V = I(PVIFA_{kd,\,n}) + F(PVIF_{kd,\,n})$$

$$= 12(PVIFA_{12\%,5}) + 100(PVIF_{12\%,5})$$

$$= 12(3.605) + 100(0.567)$$

$$= 43.26 + 56.7 = 99.96 \sqcup 100.$$

ii. When the required rate of return (kd) is greater than the coupon rate, the value of the bond is less than its par value.

If kd > coupon rate;

then, Value of bond < Par value.

b. Consider the same bond as above except that its required rate of return is 14%. Find out the value of the bond.

Solution:

If the required rate of return is 14% (greater than the coupon rate), then the value of the bond is

$$V_0 = I(PVIFA_{kd,n}) + F(PVIF_{kd,n})$$

$$= 12(3.433) + 100(0.519)$$

$$= 41.196 + 51.9$$

$$= 93.1$$

iii. When the required rate of return is less than the coupon rate, the value of the bond is greater than its par value.

i.e, if kd < coupon rate;

then, Value of bond > Par value.

If the required rate of return is 10% (less than the coupon rate), then the value of the above bond is

$$V_0 = I(PVIFA_{kd,n}) + F(PVIF_{kd,n})$$

$$= 12(PVIFA_{10\%,5}) + 100(PVIF_{10\%,5})$$

$$= 12(3.791) + 100(0.621)$$

$$= 45.492 + 62.1$$

$$= 107.59.$$

II. The following theorems show the effect of the number of years to maturity on bond values.

a. When the required rate of return (kd) is greater than the coupon rate, the discount on the bond declines as maturity approaches.

To illustrate the above, consider a bond of Enucon Ltd. with the following features:

Par value : Rs.1,000

Coupon rate : 11%

Years to maturity : 7

If the required rate of return is 13%, then the value of the bond is

$V = I(PVIFA_{kd,n}) + F(PVIF_{kd,n})$

$= 110(PVIFA_{13\%,7}) + 1,000(PVIF_{13\%,7})$

$= 110(4.423) + 1,000(0.425)$

$= 486.53 + 425 = 911.53.$

One year from now, when the maturity period will be 6 years, the value of the bond will be:

$V = 110(PVIFA13\%,6) + 1,000(PVIF13\%,6)$

$= Rs.110(3.998) + 1,000(0.480)$

$= 439.78 + 480 = 919.78$

For a required rate of return of 13%, the value of the bond will increase with the passage of time, i.e., until its maturity.

Years to maturity	Bond value
5	929.87
4	940.14
3	952.71
2	966.48
1	982.35
0	1,000.00

b. When the required rate of return (k_d) is less than the coupon rate, the premium on the bond declines as maturity approaches.

If the required rate of return on the bond of Enucon Limited is 9%, it will have a value of

$V = Rs.110(PVIFA_{9\%,7}) + 1,000(PVIF_{9\%,7})$

$= Rs.110(5.033) + 1,000(0.547)$

$= Rs.553.63 + 547 = 1,100.63$

One year hence, when the maturity period will be 6 years the value of the bond will be

$V = Rs.110(PVIFA_{9\%,6}) + 1,000(PVIF_{9\%,6})$

$= Rs.110(4.486) + 1,000(0.596)$

$= Rs.493.46 + 596 = 1,089.46.$

For a required rate of return of 9% the value of the bond decreases with the passage of time, i.e. until maturity, as can be observed from the following table.

Years to maturity	Bond value
5	1077.90
4	1064.40
3	1050.41
2	1035.49
1	1017.87
0	1000.00

III. As YTM determines a bond's market price and vice-versa, we can say that the bond's price will fluctuate in response to the change in market interest rates in the following ways:

i. A bond's price moves inversely proportional to its yield to maturity.

The present value principle states that the present value of a cash flow varies in inverse proportion to the interest rate used as a discount rate. As such if the YTM of the bond rises, the bond's market price drops and if the YTM falls, the bond's market price rises.

Illustration 5.9

The YTM of a Rs.1,000 par value bond bearing a coupon rate of 10% and maturing in 10 years is 12%. Thus, the market value of the bond is

$100\ (PVIFA_{12\%,\ 10}) + 1000\ (PVIF_{12\%,\ 10})$

= 100 x 5.650 + 1000 x 0.322

= Rs.887

If the YTM increases to 14%, the market value of the bond will drop to Rs.791.60, as calculated below

$100\ (PVIFA_{14\%,10}) + 1000\ (PVIF_{14\%,10})$

= 100 x 5.216 + 1,000 x 0.270

= Rs.791.60.

If the YTM of the same bond comes down to 8%, then the market value of the bond rises to Rs.1,134.

ii. For a given difference between YTM and coupon rate of the bonds, the longer the term to maturity, the greater will be the change in price with change in YTM. It is so because, in case of long maturity bonds, a change in YTM is cumulatively applied to the entire series of the coupon payments and the principal payment is discounted at the new rate for the entire number of years to maturity; whereas in case of short-term maturity bonds, the new YTM is applied to comparatively few coupon payments; and also, principal payment is discounted for only a short period of time. Thus, long-term bonds are more variable to changes in interest rates than short-term bonds.

Illustration 5.10

Let us take two hypothetical bonds differing only in term to maturity.

	A	B
Face Value	Rs.1000	1000
Coupon Rate	10%	10%
YTM	11%	11%
Years to Maturity	3	6
Market Value at YTM of 10%	Rs.1000	1000
Market Value at YTM of 11%	$100\ PVIFA_{11\%,3}$ + $1,000\ PVIF_{11\%,3}$ = Rs.975	$100\ PVIFA_{11\%,6}$ + $1000\ PVIF_{11\%,6}$ Rs.958
Change in Price	2.5%	4.2%

The market value of the bonds when the YTM was equal to coupon rate was equal to the face value of the bonds i.e., Rs.1,000. When, however the YTM increased to 11%, the market value of the bond with shorter maturity period dropped by only 2.5% to Rs.975 whereas the market value of the bond with longer maturity period of 6 years has dropped by 4.2% to Rs.958. Thus, the long-term bonds are characteristically more sensitive to interest rate changes than short-term bonds.

iii. Given the maturity, the change in bond price will be greater with a decrease in the bond's YTM than the change in bond price with an equal increase in the bond's YTM. That is, for equal sized increases and decreases in the YTM, price movements are not symmetrical.

Illustration 5.11

Take Rs.1,000 par value bond with a coupon rate of 10% and maturity period of 5 years. Let the YTM be 10%. Market price of the bond will be equal to Rs.1,000. A 1% increase in YTM to 11% changes price to Rs.962.6 (100 $PVIFA_{11\%,5}$ + 1,000 $PVIF_{11\%,5}$), a decrease of 3.74%. A decrease of 1% YTM to 9% changes the price to Rs.1,039 (100 $PVIFA_{9\%,5}$ + 1,000 $PVIF_{9\%,5}$) an increase of 3.9%.

Thus, an increase in bond's yield caused a price decrease that is smaller than the price increase caused by an equal-size decrease in yield.

iv. For any given change in YTM, the percentage price change in case of bonds of high coupon rate will be smaller than in the case of bonds of low coupon rate, other things remaining the same.

Consider two bonds A and B with the par value of Rs.1,000, maturing in 4 years and YTM of 10%. Bond A bears coupon rate of 10% whereas bond B bears coupon rate of 12%.

	Bond A	Bond B
Market price at YTM of 10%	(Rs.) 1,000.0	1,063.40
Market price at the changed YTM of 12%	(Rs.) 939.7	1,000.44
Change in price	6.03%	5.92%

Change in the price with the change in YTM in case of bond B carrying a higher coupon rate of 12% is only 5.92%, whereas in case of bond A with a coupon rate of 10% the change in the price is 6.03%.

v. A change in the YTM affects the bonds with a higher YTM more than it does bonds with a lower YTM.

Consider a Rs.1,000 par value ABC bond with a coupon rate of 12%, maturity period of 6 years and YTM of 10%. The market value of the bond will be Rs.1,087.

Consider another identical bond XYZ but with differing YTM of 20%. The market value of this bond will be Rs.734.

Suppose there is an increase in YTM by 20% i.e. YTM of bond ABC rises to 12% (10 x 1.2) and bond XYZ rises to 24% (i.e. 20 x 1.2). Then the market value of both bonds will change to –

Bond ABC : 120 $PVIFA_{12\%,6}$ + 1,000 $PVIF_{12\%,6}$ = Rs.1,000

Bond XYZ : 120 $PVIFA_{24\%,6}$ + 1,000 $PVIF_{24\%,6}$ = Rs.637.4

Market value of ABC bond with a lower YTM decreased by 8% [(1087 – 1,000)/1087] whereas in case of XYZ bond with an higher YTM the decrease is 13.16% {734 – 637.4)/734}

Valuation of Warrants and Convertibles

The valuation of bond is comparatively simpler than that of an equity, as the investor is certain about the expected cash flows. Hence, different models have been formulated for assessing the expected return of equity investors based on certain assumptions.

Warrants and Convertibles

Warrants and convertible debentures are commonly used instruments of financing, all over the world and they are also gaining popularity in India. The wide usage of these instruments are explained with different concepts focusing on cheaper debt, matching cash flows, financial synergy and low agency costs, etc.

DEFINITION

A warrant is a call option to buy a stated number of shares. They are like calls to the extent that they entitle the holder to buy a fixed number of shares at a predetermined price during some specified period of time. It gives the holder the right to subscribe to the equity shares of a company. Like call options, warrants may expire at a certain date. They may also be perpetual warrants, which never expire. Most warrants are detachable from the bond or preferred stock to which they were attached at the time of issue. If detached, warrants can be traded as independent securities, like call options.

Warrants are distributed to stock holders in lieu of a stock or cash dividend or sold directly as a new security issue. Sometimes, the companies issue preference shares or debentures with less favorable terms (than those investors would get otherwise). Hence, to compensate, it issues warrants to "sweeten" the offering. For example, a debenture or a bond may be sold by the company along with warrants.

WARRANT PRICE

The exercise price of a warrant is what the holder must pay to purchase the stated number of shares.

A warrant holder (investor) has no rights unlike a shareholder. A warrant holder neither receives dividends nor holds voting rights. The terms are specified for number of shares that can be purchased for each warrant, based on the exercise (purchase) price per share, and the expiry date of warrant. Usually, the ratio is 1:1, i.e., one share for each warrant.

When a warrant is issued, the exercise price is always greater than the current market price. This price may be fixed for the entire life of warrant or increased periodically.

The existence of the positive premium on a warrant means that it will be more beneficial for the warrant holder to sell his warrant, thus realizing its theoretical value plus premium, when he exercises it. The premium associated with a warrant will shrink as the expiry date approaches. The actual value of warrant will be equal to theoretical value on the expiry date.

Convertible Debentures

A financial instrument that can be converted into a different security of the same company under specific conditions is referred to as convertible security.

A convertible debenture, as the name suggests, is a debenture which is convertible partly or fully, into equity shares. If it is partially converted, it is referred to as 'partly convertible debenture' and if the debentures are converted fully into equity shares at the end of maturity, it is referred to as 'fully convertible debentures'. The option of conversion is either at the discretion of investor i.e., optional or compulsory (if it is specified).

Convertible bond or a preferred stock is converted into specified number of shares. Usually, in this conversion, no cash is involved; simply, the old security is traded and appropriate number of new securities are issued in turn.

Conversion Ratio and Conversion Value

As said above, the conversion ratio gives the number of shares of stock received for each convertible security. If only the conversion ratio is given, the par conversion price can be obtained by dividing the conversion ratio multiplied by the face or par value of the convertible security.

The conversion value represents the market value of the convertible if it were converted into stock; this is the minimum value of the convertible based on the current price of the issuer's stock.

Conversion value is obtained by multiplying the conversion ratio by the stock's current market price. For example, consider a convertible bond with Rs.1,000 (par value) converted into 20 equity shares. If the market price of the share is, say, Rs.55, then the conversion value of the bond is Rs.1,100 (20 x 55). If the conversion price of the bond is, say, Rs.1,200, then conversion premium of the bond is Rs.1,200 – 1,100, i.e., 100.

As the converted stock is effected by tax, corporate investors are less keen to invest, whereas the individual investors are attracted towards convertible securities as they need not have to pay tax.

Convertible securities have great complexity in their maturities. Some may be converted only after an initial period. Some may be converted on the bond's maturity date; others only for a stated, shorter periods. Some securities may have different conversion ratios for different years.

Let us consider an illustration, where M/s. AMA Ltd. has issued fully convertible debentures at a face value of Rs.200 with coupon rate of 15% p.a. which is converted into 4 equity shares (at a price of Rs.50 each) at the end of 3 years.

An investor, Vinay, wanted to buy debentures in the secondary market after a year of issue. Let us find out the value of the convertible, if his required rate of return is 18% and price of share is expected to be Rs.60 at the end of 3 years.

The value of convertible is determined as:

$$\sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{P_n \text{ x Conversion Ratio}}{(1+r)^n}$$

Where,

C = coupon rate

r = required rate of return

P_n = expected price of equity share on conversion

n = no. of years to maturity

$$= \frac{30}{(1.18)^1} + \frac{30}{(1.18)^2} + \frac{60 \text{ x } 4}{(1.18)^2}$$

$$= 25.42 + 21.54 + \frac{240}{(1.18)^2}$$

$$= 25.42 + 21.54 + 172.36$$

$$= 219.32$$

Thus value of the convertible is approximately Rs.220.

The investors preferring to minimize the risk can opt for warrants, as they act like a call option and convertible preferred stocks or bonds for they combine the benefits of fixed income by investing with the option of sharing the price appreciation benefits normally reserved for the common stockholders.

EQUITY VALUATION: DIVIDEND CAPITALIZATION APPROACH

People hold common stocks in their portfolios for two reasons; (i) A representative group of common stocks (like growth stocks and blue chips) bought at a reasonable price level can be counted to provide a higher total return than bonds; (ii) Common stocks can be held as a protective measure during inflation because unlike equity, a bond's value declines as inflation rises. However, the safety and attractiveness of common stock investment would be jeopardized if stocks were bought at an excessively high general market value or too much was paid for the promising prospects of favored issues. Thus, there should be a standard value for judging whether a stock is underpriced or overpriced in the market place. We call this standard value the intrinsic value.

Intrinsic value is the value of a stock which is justified by assets, earnings, dividends, definite prospects and the factor of the management of the issuing company.

The major components of intrinsic value are:

a. earning power and profitability of the management in the employment of assets;

b. dividends paid and the ability to pay such dividends in the future;

c. estimates of the growth of earnings;

d. stability and predictability of these quantitative and qualitative projections.

Thus, in essence, the intrinsic value of a firm's shares is its economic value as a going concern, taking account of its characteristics, the nature of its business and the investment environment.

According to the dividend capitalization approach, which is a conceptually sound approach, the value of an equity share is the discounted present value of dividends received plus the present value of the resale price expected when the equity share is sold. Therefore, to apply this approach for the valuation of equity stock the following assumptions are to be made:

i. Dividends are paid annually which is a common practice for business firms in India, and

ii. The 1st payment of dividend is to be made one year after the equity share is bought.

Single Period Valuation Model

This model is for an equity share wherein an investor holds it for one year. The price of such equity share will be:

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{P_1}{(1+k_e)} \qquad \text{..... (7)}$$

where,

P_0 = current market price of the share

D_1 = expected dividend a year hence

P_1 = expected price of the share a year hence

k_e = required rate of return on the equity share.

Illustration 5.12

Mercury India Ltd. is expected to declare a dividend of Rs.2.50 and reach a price of Rs.35.00 a year hence. What is the price at which the share would be sold to the investors now if the required rate of return is 13 percent?

Solution

$$\text{The current price } P_0 = \frac{D_1}{(1+k_e)} + \frac{P_1}{(1+k_e)}$$

$$= \frac{2.50}{(1+0.13)} + \frac{35.00}{(1+0.13)}$$

$$= \frac{2.50}{1.13} + \frac{35.00}{1.13}$$

$$= 2.21 + 31.00$$

$$= \text{Rs.}33.21$$

Multi-Period Valuation Model

Since there is no maturity period for equity share, the value of an equity share of infinite duration is equal to the discounted value of the stream of dividends of infinite duration.

Thus,

$$P_0 = \frac{D_1}{(1+k_e)^t} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_\infty}{(1+k_e)^\infty}$$

$$= \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t} \qquad \text{.....(8)}$$

where,

P_0 = current market price of the equity share

D_1 = expected dividend a year hence

D_2 = expected dividend two years hence

D_∞ = expected dividend at infinite duration

k_e = expected rate of return or required rate of return.

The above equation is the valuation for an equity share of infinite duration. The same can be applicable to the valuation of an equity share with a finite duration provided the investor holds the same for n years and then sells it at a price P_n. The value of an equity share of finite duration would thus be:

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n}$$

$$= \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n} \qquad \text{.....(9)}$$

Using the dividend capitalization principle, the value of P_n in the above equation (9) would be the present value of the stream of dividend beyond the nth period which is evaluated at the end of nth year. Therefore

$$P_n = \frac{D_{n+1}}{(1+k_e)} + \frac{D_{n+2}}{(1+k_e)^2} + \ldots + \frac{D_\infty}{(1+k_e)^{\infty-n}} \qquad \text{.....(10)}$$

Substituting the value of P_n in the above equation (9) and simplifying it we get,

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t} \qquad \text{.....(11)}$$

The above is the same as equation (8) which is regarded as a generalized multi-period formula used for raising, declining, constant or randomly fluctuating dividend stream. Three such instances are discussed below:

i. Constant dividends
ii. Constant growth of dividends.
iii. Changing growth rates of dividends.

i. **Valuation with Constant Dividends:** Assume that the dividend per share is constant year after year, whose value is D, then eqn.(4) becomes

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_\infty}{(1+k_e)^\infty}$$

On simplification the above equation becomes

$$P = \frac{D}{k_e} \qquad \text{.....(12)}$$

ii. **Valuation with Constant Growth in Dividends:** It is assumed that dividends tend to increase over time because business firms usually grow over time. Therefore, if the growth of the dividends is at a constant compound rate then:

$D_t = D_o(1+g)^t$

where,

D_t = dividend for year t
D_o = dividend for year 0
g = constant compound growth rate

The valuation of the share where dividend increases at a constant, compound rate is given as

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D_1(1+g)}{(1+k_e)^2} + \frac{D_1(1+g)^2}{(1+k_e)^3} + \ldots$$

On simplification

$$P_0 = \frac{D_1}{k_e - g} \qquad \text{.....(13)}$$

Illustration 5.13

Shetkani Solvents Ltd. is expected to grow at the rate of 7% per annum and dividend expected a year hence is Rs.5.00. If the rate of return is 12%, what is the price of the share today?

Solution

The price would be $P_0 = \frac{5.00}{0.12 - 0.07} = \frac{5.00}{0.05} = \text{Rs.}100$

iii. **Valuation with Variable Growth in Dividends:** Some firms have a super normal growth rate followed by a normal growth rate. If the dividends move in line with the growth rate, the price of the equity share of such firm would be

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D_1(1+g_a)}{(1+k_e)^2} + \ldots + \frac{D_1(1+g_a)^{n-1}}{(1+k_e)^n} + \frac{D_n(1+g_n)}{(1+k_e)^{n+1}} + \frac{D_n(1+g_n)^2}{(1+k_e)^{n+2}} + \ldots\ldots$$

Where

P_0 = price of the equity share

D_n = $D_1 (1 + g_e)^{n-1}$

D_1 = expected dividend a year hence

g_a = super normal growth rate of dividends

g_n = normal growth rate of dividends

For computation of P_0 in the above equation, the following procedure may be adopted.

1. Expected dividend stream during the supernormal period of the super normal growth is to be specified and the present value of this dividend stream is to be computed for which the equation to be used in

$$= \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t}$$

2. The value of the share at the end of the initial growth period is to be calculated

$$P_n = \frac{D_{n+1}}{k_e - g_n} \text{ (as per the constant growth model)}$$

which is then discounted to the present value. The discounted value therefore is

$$\frac{D_{n+1}}{k_e - g_n} \times \frac{1}{(1+k_e)^n}$$

3. Then add both the present value composites to find the value (P_o) of the share which is

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t} + \frac{D_{n+1}}{k_e - g_n} \times \frac{1}{(1+k_e)^n} \quad \text{.....(14)}$$

Illustration 5.14

Consider the equity share of Venus Lab Limited.

D_0 = current dividend per share = Rs.3.00

n = duration of the period of super normal growth = 5 years

g_a = growth rate during the period of super normal growth = 25%

g_n = normal growth rate after super normal growth period is over = 7%

k_e = investor's required rate of return = 14%

The following are the steps involved.

1. Dividend stream during super normal growth period:

D_1 = Rs.3.00 (1.25)

D_2 = Rs.3.00 $(1.25)^2$

D_3 = Rs.3.00 $(1.25)^3$

D_4 = Rs.3.00 $(1.25)^4$

D_5 = Rs.3.00 $(1.25)^5$

The present value of the above stream of dividends is

$$= \frac{3.00\,(1.25)}{(1.14)} + \frac{3.00\,(1.25)^2}{(1.14)^2} + \frac{3.00\,(1.25)^3}{(1.14)^3} + \frac{3.00\,(1.25)^4}{(1.14)^4} + \frac{3.00\,(1.25)^5}{(1.14)^5}$$

= Rs.3.29 + 3.61 + 3.96 + Rs.4.34 + Rs.4.76

= Rs.19.96.

2. The price of the share at the end of 5 years, applying the constant growth model at that point of time will be:

$$P_5 = \frac{D_6}{k_e - g_n} = \frac{D_5(1+g_n)}{k_e - g_n}$$

$$= \frac{3.00(1.25)^5\ (1.07)}{0.14 - 0.07} = \frac{9.8}{0.07} = \text{Rs.}140$$

The discounted value of this price is

$$= \frac{140.00}{(1.14)^5} = \text{Rs.}72.71$$

3. The sum of the above components is:

P_0 = Rs.19.96 + Rs.72.71

= Rs.92.67

$\therefore$ The value of the share P_0 = Rs.92.67.

Impact of Growth on Price, Returns P/E Ratio

Different companies have varied expected growth rates. While some companies remain stagnant other companies show normal growth and still others grow at a super normal growth rate. Assuming a constant required rate of return, varying growth rates mean difference in stock prices, dividend yields, capital gain yield and price earning ratio.

To illustrate the above, three cases can be considered.

	Growth rate (%)
Firm with no growth	0
Firm with normal growth rate	6
Firm with super normal growth rate	10

The expected earning per share and dividend per share of each of the above firms are Rs.5.00 & Rs.4.00 respectively. The required rate of return from equity investments is 16%.

We can calculate the stock price, dividend yield, capital gain yield and price-earning ratio for all the above cases with the given information.

Price, Dividend yield, Capital gains yield, & Price-earnings ratio under differing growth assumption for 16% required rate of return.

Price	Dividend Yield $\left(\frac{D_1}{P_0}\right)$	Capital Gain Yield $\left(\frac{P_1 - P_0}{P_0}\right)$	P/E Ratio (P/E)
No growth firm $P_0 = \frac{D_1}{K}$ $\text{Rs.}\frac{\text{Rs.}4.00}{0.16} = \text{Rs.}25$	16%	0%	5
Normal growth firm $P_0 = \frac{D_1}{K-g}$ $\frac{\text{Rs.}4.00}{0.16-0.06} = \text{Rs.}40$	10%	6%	8
Super normal growth $P_0 = \frac{D_1}{K-g}$ $= \frac{\text{Rs.}4.00}{0.16-0.10} = \text{Rs.}67$	6%	10%	13.4

Looking at the table, we can say that:

1. Other things being equal, as the expected growth in dividend increases, the expected return i.e., (the total return = dividend yield + capital gain yield) depends more on the capital gain yields, less on the dividend yield.
2. Other things being equal, the price-earning ratio increases as the expected growth rate in dividend increases.
3. High dividend yield and low price earning ratio imply limited growth prospects.
4. Low dividend yield and high price earnings ratio imply considerable growth prospects.

Equity Valuation: Ratio Approach

The ratio approach which is rather simpler to use is followed by most practitioners. Some of the ratios employed in the context of valuation are discussed hereunder.

a. Book value

b. Liquidation value

c. Price/Earnings ratio.

Book Value

The book value per share is the net worth of the company (paid-up equity capital plus reserves and surplus) divided by the number of outstanding equity shares.

Book Value = Net worth (Paid equity capital + reserves + surplus) ÷ Number of outstanding equity shares.

Liquidation Value

Liquidation value per share is equal to:

$$\frac{\text{Value realized from liquidating all the assets of the firm} - \text{Amount to be paid to all the creditors and preference shareholders}}{\text{No. of outstanding equity shares}}$$

This is more realistic than the book value. However, it has two obstacles (1) It would be difficult to estimate the amount realized from liquidation of various assets (2) Liquidation value does not reflect earning capacity.

Price-Earning Ratio

Financial analysts have used this P/E model more frequently than other models. According to this, the intrinsic value of the share is:

Expected earning per share x Appropriate price – Earning ratio.

The expected earning per share is:

$$\frac{\text{Expected PAT} - \text{Preference dividend}}{\text{Number of outstanding equity shares}}$$

Preference dividends and the number of outstanding equity shares can be defined but the expected PAT is quite difficult to estimate. Therefore, factors like sales, gross profit margin, depreciation, interest burden and tax rate will have to be considered to arrive at an appropriate figure for PAT.

To establish an appropriate price-earnings ratio for a given share, to start with, the price-earnings ratio for the market as a whole and also for the industry will have to be considered. Then the P/E ratio applicable to the particular share under consideration should be judged for which the following factors are to be considered.

1. Growth rate
2. Stability of earnings
3. Size of the company
4. Quality of management
5. Dividend pay-out ratio.

The impact of the above factors in P/E ratio is rather difficult to quantify. However, qualitative observation can be made.

The higher the growth rate, the higher the P/E ratio; the greater the stability of earnings, the higher the P/E ratio; the larger the size of the company, the higher the P/E ratio; the higher the dividend pay-out ratio, the higher the P/E ratio.

E(P/E) Ratio

The E(P/E) ratio is formed by dividing the present value of the share by the expected earnings per share denoted by E(EPS).

$$\therefore E(P/E) = \frac{PV\ per\ share}{E(EPS)}$$

Substituting the present value per share by the present value formula as per dividend discount model get

$$E(P/E) = \frac{D}{k-g} \times \frac{1}{E(EPS)} \text{ or } \frac{D/E(EPS)}{(k-g)}$$

where the numerator is nothing but the expected dividend pay-out ratio.

Comparing Expected and Actual P/E Ratios

Step 1

Estimate the stock's expected price-earning ratio, E(P/E), by studying fundamental facts about the firm.

Step 2

Observe the stock's current P/E by checking price and earnings data in newspapers or investment periodicals.

Step 3

Compare the stock's actual P/E with its E(P/E) and then consult the investment decision rules below:

a. If the E(P/E) exceeds the actual P/E, the stock is currently underpriced and this is the time to buy.

b. If the E(P/E) is less than the actual P/E, the stock is currently overpriced and this is the time to sell (or sell short).

c. If the E(P/E) equals the actual P/E, the stock is correctly priced – neither buying nor selling is desirable.

SUMMARY

The concept of time value of money provides a fundamental background for the valuation of bonds and stocks. Value of any security can be defined as the present value of its future cash streams i.e.,

$$V_0 = \frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + ... + \frac{C_n}{(1+k)^n} = \sum_{t=1}^{n} \frac{C_n}{(1+k)^t}$$

Where

V_0 = Value of the asset at time zero,

P_0 = Present value of assets,

C_t = Expected cash flow at the end of period t ,

k = Discounted rate of required rate of return on the cash flow,

n = Expected life of an asset.

Face value of a bond is the value stated on the bond. A bond carries a rate of interest, which is called coupon rate. Bond is issued for a specific period, which is called maturity of the bond. The value that a bondholder gets on maturity is called redemption value.

Yield of a bond can be measured using several methods viz. single period rate of return, current yield and yield to maturity.

When the required rate of return is equal to the coupon rate, the value of bond is equal to its par value.

When the required rate of return is greater than the coupon rate, the value of bond is less than its par value.

When the required rate of return is less than the coupon rate, the value of bond is greater than its par value.

When the required rate of return is greater than the coupon rate, the discount on the bond declines as maturity approaches.

When the required rate of return is less than the coupon rate, the premium on the bond declines as maturity approaches.

A bond's price moves inversely to its yield to maturity.

For a given difference between YTM and coupon rate of the bonds, the longer the term to maturity, the longer will be the change in price with change in YTM.

Given the maturity, the change in bond price will be greater with a decrease in the bond's YTM than the change greater price with an equal increase in the bond's YTM.

For any given change in YTM, the percentage price change in case of bonds of high coupon rate will be smaller than in the case of bonds of low coupon rate, other things remaining the same.

A change in the YTM affects the bonds with a higher YTM more than it does bonds with lower YTM.

The value of a convertible is determined as:

$$V_0 = \sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{(P_n) \text{ x Conversion ratio}}{(1+r)^n}$$

Chapter VI

Financial Statement Analysis

After reading this chapter, you will be conversant with:

- Principal Tools of Analysis
- Ratio Analysis
- Different Types of Ratios and their Significance
- Problems Encountered in Financial Statement Analysis

Financial Statements

A financial statement is a compilation of data, which is logically and consistently organized according to the accounting principles. Its purpose is to convey an understanding of some financial aspects of a business firm. It may show a position at a moment in time, as in the case of a balance sheet, or may reveal a series of activities over a given period of time, as in the case of an income statement. Financial statements are the major means through which firms present their financial situation to stockholders, creditors, and the general public. The majority of firms include extensive financial statements in their annual reports, which are distributed widely.

The Nature of Financial Statement Analysis

A financial statement analysis consists of the application of analytical tools and techniques to the data in financial statements in order to derive from them measurements and relationships that are significant and useful for decision making.

The process of financial analysis can be described in various ways, depending on the objectives to be obtained. Financial analysis can be used as a preliminary screening tool in the selection of stocks in the secondary market. It can be used as a forecasting tool of future financial conditions and results. It may be used as a process of evaluation and diagnosis of managerial, operating, or other problem areas. Above all, financial analysis reduces reliance on intuition, guesses and thus narrows the areas of uncertainty that is present in all decision making processes. Financial analysis does not lessen the need for judgment but rather establishes a sound and systematic basis for its rational application.

Sources of Financial Information

The financial data needed in the financial analysis come from many sources. The primary source is the data provided by the firm itself in its annual report and required disclosures. The annual report comprises of the income statement, the balance sheet, and the statement of cash flows, as well as footnotes to these statements. Besides this, information such as the market prices of securities of publicly traded corporations can be found in the financial press and the electronic media daily. The financial press also provides information on stock price indices for industries and for the market as a whole.

The development of this chapter on financial statement analysis is carried out with the help of balance sheets and profit and loss accounts of Rainbow-chem Industries for the last five years given in table 6.1 and table 6.2.

Table 6.1
Balance Sheet of Rainbow-chem Industries
for the years 1 to 5

(Rs. crore)

	Year 5	Year 4	Year 3	Year 2	Year 1
SOURCES OF FUNDS					
A. Share Capital	11.65	11.65	9.63	7.94	7.94
B. Reserves Total	71.36	59.50	37.05	20.14	16.89
C. Total Shareholders Funds (A + B)	83.01	71.15	46.68	28.08	24.83
D. Secured Loans	48.62	41.25	60.45	53.43	30.58
E. Unsecured Loans	25.70	19.34	10.51	11.50	14.50
F. Total Debt (D + E)	74.32	60.59	70.96	64.93	45.08
G. Total Liabilities (C + F)	157.33	131.74	117.64	93.01	69.91

		Year 5	Year 4	Year 3	Year 2	Year 1
APPLICATION OF FUNDS						
H.	Gross Block	110.05	103.89	90.90	75.27	56.81
I.	Less: Accum. Depreciation	52.02	50.02	44.46	40.26	36.88
J.	Net Block (H - I)	58.03	53.87	46.44	35.01	19.93
K.	Capital Work-in-Progress	6.88	5.51	4.77	3.76	8.00
L.	Investments	6.63	3.03	2.89	2.89	2.65
M.	Current Assets, Loans & Advances (N + O + P + Q)					
N.	Inventories	46.30	40.48	34.87	35.53	41.20
O.	Sundry Debtors	49.85	37.30	37.75	30.53	31.86
P.	Cash and Bank Balances	1.85	1.62	1.10	1.62	1.26
Q.	Loans and Advances	23.10	14.88	11.16	10.23	6.90
R.	Less: Current Liab. & Prov. (S + T)					
S.	Current Liabilities	32.36	21.53	19.17	24.63	39.99
T.	Provision	4.24	3.42	2.17	1.93	1.90
U.	Net Current Assets (M - R)	84.50	69.33	63.54	51.35	39.33
V.	Misc. Expenses not w/o	1.29	0.00	0.00	0.00	0.00
X.	Total Assets (J + K + L + U + V)	157.33	131.74	117.64	93.01	69.91

Table 6.2
Profit & Loss Accounts for the years 1 to 5

(Rs. crore)

		Year 5	Year 4	Year 3	Year 2	Year 1
	INCOME					
A.	Sales Turnover	261.00	214.41	181.29	155.58	131.94
B.	Other Income	9.81	11.21	8.71	9.50	6.14
C.	Stock Adjustments*	4.10	2.99	0.97	-3.11	6.67
D.	Total Income (A + B + C)	274.91	228.61	190.97	161.97	144.75
	EXPENDITURE					
E.	Raw Materials	122.42	97.04	75.05	66.67	66.46
F.	Power & Fuel Cost	16.72	14.26	13.41	9.96	8.98
G.	Employee Cost	26.12	21.21	19.49	16.02	13.50
H.	Other Manufacturing Expenses	16.84	14.64	13.52	11.60	10.94
I.	Excise Duty	30.74	26.47	24.36	22.22	18.10
J.	Selling and Administration Expenses	15.98	10.15	9.23	7.09	5.85
K.	Miscellaneous Expenses	8.78	7.83	5.33	5.11	4.00
L.	Less: Preoperative Expenses Capitalized	0.00	0.00	0.00	0.00	0.00
M.	Operating Profit (D – E – F – G – H – I – K + L)	37.31	37.01	30.58	23.30	16.92
N.	Interest	9.58	10.71	13.57	11.42	7.65
O.	PBDT (M – N)	27.73	26.30	17.01	11.88	9.27
P.	Depreciation	6.49	6.37	4.76	3.56	2.41
Q.	Profit Before Tax (O – P)	21.24	19.93	12.25	8.32	6.86
R.	Tax	5.30	5.00	3.60	3.00	2.70

		Year 5	Year 4	Year 3	Year 2	Year 1
S.	Net Profit (Q – R)	15.94	14.93	8.65	5.32	4.16
T.	Adjustments for Net Profit**	0.00	0.71	0.23	-0.15	0.32
U.	P & L Balance brought forward	6.55	2.50	1.65	1.50	1.01
V.	Appropriations ***	14.48	11.59	8.03	5.02	3.99
W.	P & L Balance carried down (S + T + U – V)	8.01	6.55	2.50	1.65	1.50

* Stock Adjustments

Stock adjustment can be achieved in the following ways:

Closing stock of finished goods + Closing stock of work-in-progress + Closing stock of other material – Opening stock of work-in-progress – Opening stock of finished goods – Opening stock of other material.

= 17.89 + 14.42 + 0.00 – 14.88 – 13.33 – 0.00 = 4.10.

** Adjustments for Net Profit

In this category, extraordinary incomes like sales of assets, income accrued because of changes in accounting policies, etc. are adjusted from net profit.

*** Appropriations

Appropriated to General Reserve	=	9.87
Provision for Equity Dividend	=	4.08
Debenture Redemption Reserve	=	0.53
TOTAL		14.48

THE PRINCIPAL TOOLS OF ANALYSIS

In the analysis of financial statements, the analyst has a variety of tools available to choose the best that suits his specific purpose. The following are the important tools of analysis.

1. Ratio analysis
   – Comparative analysis
   – Du-pont analysis
2. Funds flow analysis.

RATIO ANALYSIS

Ratios are well-known and most widely used tools of financial analysis. A ratio gives the mathematical relationship between one variable and another. Though computation of a ratio involves only a simple arithmetic operation, its interpretation is a difficult exercise. The analysis of a ratio can disclose relationships as well as basis of comparison that reveal conditions and trends that cannot be detected by going through the individual components of the ratio. The usefulness of ratios ultimately depends on their intelligent and skillful interpretation.

Ratios are used by different people for various purposes. Ratio analysis mainly helps in valuing the firm in quantitative terms, Two groups of people who are interested in them are creditors and shareholders; creditors are further divided into short-term creditors and long-term creditors.

Short-term creditors hold obligations that will soon mature and they are concerned with the firm's ability to pay its bills promptly. In the short run, the amount of liquid assets determines the ability to clear off current liabilities. These persons are interested in liquidity. Long-term creditors hold bonds or mortgages against the firm and are interested in current payments of interest and eventual repayment of principal. The firm must be sufficiently liquid in the short-term and have adequate profits for the long-term. These persons examine liquidity and profitability.

In addition to liquidity and profitability, the owners of the firm (shareholders) are concerned about the policies of the firm that affect the market price of the firm's stock. Without liquidity, the firm cannot pay cash dividends. Without profits, the firm would not be able to declare dividends. With poor policies, the common stock would trade at low prices in the market.

Considering the needs of users, financial ratios can be grouped as:

Liquidity ratios

- Profitability or efficiency ratios
- Ownership ratios
  - Earnings ratio
  - Leverage ratios
    - Capital structure ratios
    - Coverage ratios
    - Dividend ratios

Liquidity Ratios

Liquidity implies a firm's ability to pay its debts in the short run. This ability can be measured by the use of liquidity ratios. Short-term liquidity involves the relationship between current assets and current liabilities. If a firm has sufficient net working capital (excess of current assets over current liabilities) it is assumed to have enough liquidity. The current ratio and the quick ratio are the two ratios, which directly measure liquidity. The ratios like receivables turnover ratios and inventory turnover ratios indirectly measure the liquidity.

CURRENT RATIO

The liquidity ratio is defined as: $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

Current assets include cash, marketable securities, debtors, inventories, loans and advances, and pre-paid expenses. Current liabilities include loans and advances taken, trade creditors, accrued expenses, and provisions.

From the balance sheet data given in table 6.1 for the year 5, the current ratio for the year can be calculated as:

$$\text{Current ratio} = \frac{46.30+49.85+1.85+23.10}{32.36+4.24}$$

$$= \frac{121.1}{36.6} = 3.31$$

As the current ratio measures the ability of the enterprise to meet its current obligations, a current ratio of 3.31: 1 implies that the firm has current assets which are 3.31 times the current liabilities. A current ratio of 3.31 is considered to be very healthy. The ideal current ratio is 2:1.

In the operating cycle of the firm current assets are converted into cash to provide funds for the payment of current liabilities. So higher the current ratio, higher the short-term liquidity. But in interpreting the current ratio care should be taken in looking into the composition of current assets. A firm which has a large amount of cash and accounts receivable is more liquid than a firm with a high amount of inventories in its current assets, though both the firms may have the same current ratio. To overcome this a more stringent form of liquidity ratio referred to as quick ratio can be calculated.

QUICK RATIO

Quick-test (also known as **acid-test ratio**) is defined as:

$$= \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$= \frac{\text{Current Assets} - \text{Inventotries}}{\text{Current Liabilities}}$$

The quick ratio is a more stringent measure of liquidity because inventories, which are least liquid of current assets, are excluded from the ratio. Inventories have to go through a two-step process of first being sold and converted into receivables and secondly collected. The quick test is so named because it gives the abilities of the firm to pay its liabilities without relying on the sale and recovery of its inventories. Another variant of Quick ratio is : $\frac{\text{Quick assets (QA)}}{\text{Quick liabilities (QL)}}$.

Where, QL = CL – Bank over draft – income received in advance

Quick ratio of Rainbow-chem Industries for the year 5 is calculated as:

$$\text{Quick ratio} = \frac{121.1 - 46.30}{36.6} = 2.04$$

From the above figures, we can infer that as the proportion of inventories in total current assets is 38.23%, and the liquidity ratio of the firm decreased from 3.31 to 2.04. Though there is no standard with which the ratio can be compared, normally ratios are compared with the industry figures in the absence of predetermined standards. In the above case, the quick ratio for the industry (dyes and pigments) is 2.26. As the quick ratio is below the industry average, we can conclude that the liquidity position is below average though the current ratio gives a different picture.

Limitations of the Current and Quick Ratios

The current ratio is a static or stock concept of what resources are available at a given moment in time to meet the obligations at that moment. The ratio has limitations in the following aspects:

1. Measuring and predicting the future fund flows.
2. Measuring the adequacy of future fund inflows in relation to outflows.

The existing pool of net funds does not have a logical or causative relationship to the future funds that will flow through it. Yet it is the future flows that are the subject of our greatest interest in the assessment of liquidity. These flows depend importantly on elements not included in the ratio, such as sales, cash costs and expenses, profits, and changes in business conditions. This concept will be clear, when we study of funds flow analysis.

BANK FINANCE TO WORKING CAPITAL GAP RATIO

$$= \frac{\text{Short-term bank borrowings}}{\text{Working capital gap}}$$

Where working capital gap is equal to current assets less current liabilities other than bank borrowings.

This ratio shows us the degree of the firm's reliance on short-term bank finance for financing the working capital gap.

Turnover Ratios

Receivables turnover ratios and inventory turnover ratios measure the liquidity of a firm in an indirect way. Here the measure of liquidity is concerned with the speed with which inventory is converted into sales and accounts receivables converted into cash. The turnover ratios give the speed of conversion of current assets (liquidity) into cash.

Two ratios are used to measure the liquidity of a firm's account receivables. They are:

a. Accounts receivable turnover ratio

b. Average collection period

Accounts Receivable Turnover Ratio

$$= \frac{\text{Net credit sales}}{\text{Average accounts receivable}}$$

The average accounts receivable is obtained by adding the beginning receivables of the period and the ending receivable, and dividing the sum by two. The sales figure in the numerator is only credit sales, because firm cash sales don't give any receivables. As the publicly available information on the firm may not disclose the credit sales details, the analyst has to assume that cash sales are insignificant. Normally the receivables ratios are useful for internal analysis.

Higher the receivables turnover ratio, greater the liquidity of the firm. However, care should be taken to see that to project higher receivables turnover ratio, the firm does follow a strict credit policy.

The accounts receivables position of the Rainbow-chem Industries for two years is as follows:

	Year 5	Year 4
Sundry debtors more than 6 months	04.19	01.31
Other debtors	45.66	35.99
Prov. for doubtful debts.	00.00	00.00
Total Debtors	49.85	37.30

Average accounts receivables = (49.85 + 37.30)/2

= 43.58

Average receivables turnover = 261/43.58

= 5.99 (6 Approx.)

Turnover ratio gives, how many times on an average the receivables are generated and collected during the year. In our case, the average receivables turnover ratios of 6 indicates that on an average receivables are revolved 6 times during the year. When we compare this with the industry norm of 5.16 times, we can say that the firm's liquidity of accounts receivables is on average 16.28% more than that of the industry.

Average Collection Period

One can get a sense of the speed of collections from receivables turnover ratio and it is valuable for comparison purposes, but we cannot directly compare it with the terms of trade usually given by the firm. For example, the firm may be having a policy of giving certain percent of discount if the debtor pays in certain period of time. Such comparison is best made by converting the turnover into days of sales tied up in receivables.

The ratio that gives the above comparison is average collection period, which is defined as the number of days it takes to collect accounts receivable. It can be obtained by dividing 360 by the average receivables turnover ratio calculated above. That is,

$$\text{Average collection period} = \frac{360}{\text{Average accounts receivables turnover}}$$

$$= \frac{\text{Average accounts receivable}}{\text{Average daily sales}}$$

For Rainbow-chem Industries, assuming that there is only one sundry debtor the average collection period is equal to 60 days (360/6). If the firm is having a credit policy of giving substantial discounts if the receivables are collected within 30 days, the debtor will not be able to avail the discounts. If we compare the above with the industry figure (i.e. 360/5.16 = 69.76 days), the firm is having better collection period.

Evaluation

Accounts receivable turnover ratios or collection periods can be compared to industry averages or to the credit terms granted by the firm to find out whether customers are paying on time. If the terms, for example say the average collection period is 30 days and the realized average collection period is 60 days, it could reflect the following:

1. Collection job is poor.
2. In spite of careful collection efforts, the firm has difficulty in obtaining prompt payments.
3. Customers face financial problems.

The first conclusion requires remedial managerial action, while the second and third conclusions convey the quality and liquidity of the accounts receivables.

Inventory Turnover

The liquidity of a firm's inventory may be calculated by dividing the cost of goods sold by the firm's inventory. The inventory turnover, or stock turnover, measures how fast the inventory is moving through the firm and generating sales. Inventory turnover can be defined as:

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Higher the ratio, greater the efficiency of inventory management. The importance of inventory turnover can also be looked from a different point of view i.e. it helps the analyst measure the adequacy of goods available to sell in comparison to the actual sales orders.

In this regard, the presence of inventory involves two risks:

1. Running out of stock due to low inventory (high turnover) which may indicate future shortages.
2. Excessive carrying charges because of high inventory (low turnover).

One has to manage carefully between running out of goods to sell and investing in excessive inventory otherwise it will result in either a high or low ratio, which may be an indication of poor management. The analyst should keep in mind that high and low turnovers are relative in nature. The current turnover must be compared to previous periods or to some industry norms before it is branded as high, low, or normal. The nature of the business should also be considered in analyzing the appropriateness of the size and turnover of the inventory. For example, a manufacturing firm which has to import its key raw materials is justified in keeping high inventory of raw materials if it finds out that its base currency has been depreciating against the exporting country's currency consistently. In this case, high inventory is kept if the cost of imported raw materials on account of depreciation is more than the cost of storage.

In the case of Rainbow-chem Industries the inventory turnover could be calculated as follows. First, for calculating the cost of goods sold, we have to add all the expenses in the profit and loss account including depreciation charges and excluding interest expenses. Average inventory can be obtained by adding the closing inventory (Year 5) and the opening inventory (Year 4) and dividing them by two. If the figures of inventory are available for each quarter/month, we can get a better average figure of inventory.

$$\text{Inventory turnover} = \frac{244.09}{(46.30 + 40.48)/2} = 5.63$$

The average industry inventory turnover is 4.3. A meaningful conclusion about the inventory turnover can be arrived after studying its composition, its change over the years and comparing the turnover trends with the industry.

Table 6.3

Trend Analysis of Inventory Composition

Inventory composition	Year 5	Year 4	Year 3	Year 2	Year 1
Raw materials	13.99 (30.22)	12.28 (30.34)	6.18 (17.73)	11.28 (31.75)	13.83 (33.57)
Work-in-progress	14.42 (31.14)	14.87 (36.73)	12.37 (35.47)	12.22 (34.39)	12.79 (31.04)
Finished goods	17.89 (38.64)	13.33 (32.93)	16.32 (46.80)	12.03 (33.86)	14.58 (35.39)
Total	46.30 (100)	40.48 (100)	34.87 (100)	35.53 (100)	41.2 (100)

Table 6.4

Inventory turnover ratio	Year 5	Year 4	Year 3	Year 2
Rainbow-chem Industries Ltd.	5.63	5.25	4.69	3.10
Dyes & Pgm. Industry	4.31	4.40	4.28	3.87

Table 6.5

Growth Rates

Items	Year 5	Year 4	Year 3
Sales (Rainbow-chem)	21.72	18.26	16.52
Inventory (Rainbow-chem)	14.37	16.08	-9.80
Sales (Industry)	21.42	12.63	17.42
Inventory (Industry)	23.65	7.67	6.14

Table 6.6

Overall Liquidity Position

Ratios	Definition	Rainbow-chem Ltd.	Dyes & Pigm Ind.
Liquidity or Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	3.31	3.53
Quick Ratio	$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$	2.04	2.26
Accounts Receivable Turnover Ratio	$\frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$	5.99	5.16
Average Collection Period	$\frac{360}{\text{Accounts Receivables/Turnover}}$	60	70
Inventory Turnover	$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$	5.63	4.31

From the above table, it can be noticed that the Rainbow-chem's current and quick ratios are just below the average industry figures, and receivables turnover ratios are above the industry averages to an extent. Inventory turnover is in a better position compared to the industry which is concluded in the overall analysis of inventory turnover in the respective section.

In conclusion, the liquidity position of the Rainbow-chem Industries Ltd. can be said to be above average.

Profitability or Efficiency Ratios

These ratios measure the efficiency of the firm's activities and its ability to generate profits. There are two types of profitability ratios.

1. Profits in Relation to Sales:

It is important from the profit standpoint that the firm be able to generate adequate profit on each unit of sales. If sales lack a sufficient margin of profit, it is difficult for the firm to cover its fixed charges on debt and to earn a profit for shareholders. Two popular ratios in this category are gross profit margin ratio, and net profit margin ratio.

2. Profits in Relation to Assets:

It is also important that profit be compared to the capital invested by owners and creditors. If the firm cannot produce a satisfactory profit on its asset base, it might be misusing its assets. They are also referred to as rate of return ratios are discussed in this chapter. Ratios like asset turnover ratio, earning power and return on equity.

GROSS PROFIT MARGIN RATIO

The gross profit margin ratio (GPM) is defined as:

$$= \frac{\text{Gross Profit}}{\text{Net Sales}}$$

where net sales = Sales – Excise duty

This ratio shows the profits relative to sales after the direct production costs are deducted. It may be used as an indicator of the efficiency of the production operation and the relation between production costs and selling price. GPM for Rainbow-chem Industries is calculated as:

$$= \frac{52.26}{230.26} = 22.69\%$$

The gross profit margin of Rainbow-chem Industries at 22.69% is much higher than the industry norm of 10.6%.

NET PROFIT MARGIN RATIO

The net profit margin ratio is defined as:

$$= \frac{\text{Net Profit}}{\text{Net Sales}}$$

This ratio shows the earnings left for shareholders (both equity and preference) as a percentage of net sales. It measures the overall efficiency of production, administration, selling, financing, pricing, and tax management. Jointly considered, the gross and net profit margin ratios provide the analyst available tool to identify the sources of business efficiency/inefficiency.

NPM for Rainbow-chem $= \frac{15.94}{230.26}$

$= 6.92\%$

NPM for industry $= 6.39\%$

In comparison with the industry, net profit margin ratio is just above the average percentage figure. Had this been below the industry average, it would have indicated some mismanagement in the areas excluding production (as GPM is in line with the industry).

ASSET TURNOVER

It highlights the amount of assets that the firm used to generate its total sales. The ability to generate a large volume of sales on a small asset base is an important part of the firm's profit picture. Idle or improperly used assets increase the firm's

need for costly financing and the expenses for maintenance and upkeep. By achieving a high asset turnover, a firm reduces costs and increases the eventual profit to its owners.

Asset turnover ratio is defined as:

$$= \frac{\text{Sales}}{\text{Average assets}}$$

Average assets is calculated by adding the opening stock of assets (previous year's closing stock of assets) and closing stock of assets of the present year and dividing by two. If quarterly figures of assets are available, we can compute a better 'average assets' value.

Asset turnover for Rainbow-chem

$$= \frac{261.00}{(193.93+156.59)/2} = 1.49$$

Industry asset turnover is 1.15. An asset turnover ratio of 1.49 indicates that the firm with an asset base of 1 unit could produce 1.49 units of sales. This is healthy sign both in absolute terms and also in comparison with the industry average as the turnover of the industry is only 1.15.

EARNING POWER

Earning power is a measure of operating profitability and it is defined as:

$$= \frac{\text{Earnings before interest and taxes}}{\text{Average total assets}}$$

The earning power is a measure of the operating business performance which is not effected by interest charges and tax payments. As it does not consider the effects of financial structure and tax rate it is well suited for inter-firm comparisons.

Rainbow-chem's earning power $= \frac{30.82}{175.26}$

$= 0.1758$

or $= 17.58\ \%$

Inter-firm comparisons of earning power percentages

Company	Year 5 Earning power
Rainbow-chem Industries	17.58%
Atul Products	13.76%
Indian Dyestuff	16.18%
Mardia Chem	17.34%
Sudarshan Chem	13.33%
Industry (dyes & pigm (large))	16.29%

From the table, we can conclude that Rainbow-chem tops the industry with a percentage of 17.58%, whereas the average is only 16.29%. Rainbow-chem is operationally very efficient in comparison with all the players in the industry.

RETURN ON EQUITY

The return on equity (ROE) is an important profit indicator to shareholders of the firm. It is calculated by the formula:

$$\frac{\text{Net income}}{\text{Average equity}}$$

Net income denotes profit after tax (PAT) and average equity is obtained by taking the average equities of year 5 and year 4. The return on equity measures the profitability of equity funds invested in the firm. It is regarded as a very important measure because it reflects the productivity of capital employed in the firm. It is influenced by several factors: earning power, debt-equity ratio, average cost of debt funds, and tax rate.

$$\text{ROE for Rainbow-chem} = \frac{15.94}{77.08} = 20.68\%$$

Return on equity for the industry is 13.18%. The firm's healthiness in this respect also can be easily seen from the differences in returns of equity. Rainbow-chem is giving 20.68% return to the equity holders, whereas the industry is giving only 13.18%. Thus, we can conclude that Rainbow-chem has employed its resources productively.

Overall Profitability (Efficiency) Analysis

Rainbow-chem's profitability ratios are summarized in the following table against the industry.

Ratios	Rainbow-chem Ltd.	Dyes & Pigm Ind.
Gross Profit Margin	22.69%	10.60%
Net Profit Margin	6.92%	6.39%
Asset Turnover	1.49%	1.25%
Return on Equity	20.68%	13.80%
Earning Power	17.58%	14.12%

As mentioned in the beginning of this section, profitability is analyzed in two respects, viz. in relation to sales and assets. The above table conveys that, Rainbow-chem Industries is able to generate profits in relation to sales on an average scale, but in respect of efficient application of assets it performs well above the average. This indicates that some remedial measures have to be taken from the sales point of view.

Ownership Ratios

Ownership ratios will help the stockholder to analyze their present and future investment in a firm. Stockholders (owners) are interested to know how the value of their holdings is affected by certain variables. Ownership ratios compare the investment value with factors such as debt, earnings, dividends and the stock's market price. By understanding the liquidity and profitability ratios, one can gain insights into the soundness of the firm's business activities, whereas by analyzing the ownership ratios, the analyst can assess the likely future value of the market.

Ownership ratios are divided into three main groups. They are:

1. Earnings Ratios
2. Leverage Ratios
   - Capital Structure Ratios
   - Coverage Ratios
3. Dividend Ratios.

EARNINGS RATIOS

The earnings ratios are earnings per share (EPS), price-earnings ratio (P/E ratio), and capitalization ratio. From earnings ratios we can get information on earnings of the firm and their effect on price of common stock. In the following paragraphs we will discuss the above ratios in detail.

Earnings Per Share (EPS)

Shareholders are concerned with the earnings of the firm in two ways. One is availability of funds to pay their dividends and the other to expand their interest in the firm with the retained earnings. These earnings are expressed on a per share basis which is in short called EPS. EPS is calculated by dividing the net income by the number of shares outstanding. Mathematically, it is calculated as follows:

Earning per share (EPS)

$$= \frac{\text{Net income (PAT)}}{\text{Number of outstanding shares}}$$

A cross-sectional and year-to-year analysis (will be discussed in later sections in detail) can be very informative to the analyst. As an example let us take two firms Atul Products and Rainbow-chem Industries in the Dyes & Pigm. (large) industries. Assuming the market price of each stock as Rs.50 per share, the earnings trend for the two firms is as follows:

Firm	Year 5	Year 4	Year 3	Year 2	Year 1
Atul Products (EPS)	5.97	8.18	5.15	7.96	12.16
Rainbow-chem (EPS)	13.68	12.81	8.98	6.70	5.24

From the above table, it can be easily understood that the Rainbow-chem Industries began at a low EPS of Rs.5.24 per share but steadily progressed and nearly tripled its EPS in 5 years. Whereas, Atul Products started at a high EPS of Rs.12.16 per share but in 5 years declined up to Rs.5.97 per share. The trends of the two earnings streams appear to forecast a brighter future for Rainbow-chem Industries than for Atul Products. If we go further into the reasons behind this performance of Atul Products, we can find that over the years, the share capital of Atul products has increased without proportionate increase in the net income. We will get an even more clear picture if we compare all the players in the industry.

Price-Earnings Ratio

The price-earnings ratio (also P/E multiple) is calculated by taking the market price of the stock and dividing it by earnings per share.

$$\text{Price-earnings multiple} = \frac{\text{Market price of the share}}{\text{Earnings per share}}$$

This ratio gives the relationship between the market price of the stock and its earnings by revealing how earnings affect the market price of the firm's stock. If a stock has a low P/E multiple, for example 3/1, it may be considered as an undervalued stock. If the ratio is 80/1, it may be viewed as overvalued. It is the most popular financial ratio in the stock market for secondary market investors. The P/E ratio method is useful as long as the firm is a viable business entity, and its real value is reflected in its profits.

The P/E multiples for Rainbow-chem Industries is calculated as follows:

Table 6.7

	Year 5	Year 4	Year 3	Year 2	Year 1
Share price	425	450	130	240	80
EPS	13.68	12.81	8.98	6.70	5.24
P/E	31.06	35.12	14.47	35.82	15.26

The main use of P/E ratio is it helps to determine the expected market value of a stock. For example, one firm A may be having a P/E of 5/1 and another firm B of 9/1. If we assume the average industry P/E and EPS as 7/1, Rs.3 respectively and earning per shares of both the firms as Rs.3, we will get the following results.

Market value of industry = 7 x 3 = 21

Market value of firm A = 5 x 3 = 15

Market value of firm B = 9 x 3 = 27

THE CAPITALIZATION RATE

$$\text{Capitalization rate} = \frac{\text{Earning per share}}{\text{Market price of the share}}$$

The P/E ratio also may be used to calculate the rate of return investors expect before they purchase a stock. The reciprocal of the P/E ratio, i.e. (market price/EPS) gives this return. For example, if a stock has Rs.12 EPS and sells for Rs.100, the marketplace expects a return of 12/100, i.e. 12 percent. This is called the stock's **capitalization rate**. A 12 percent capitalization implies that the firm is required to earn 12 percent on the common stock value. If the investors require less than 12% return they will pay more for the stock and capitalization rate would drop.

	Year 5	Year 4	Year 3	Year 2	Year 1
Capitalization rate	0.032	0.028	0.069	0.0279	0.0655

For Rainbow-chem Industries, rates are very low because of very high prices in comparison to earning per share.

Leverage Ratios

When we extend the analysis to the long-term solvency of a firm we have two types of leverage ratios. They are structural ratios and coverage ratios. Structural ratios are based on the proportions of debt and equity in the capital structure of the firm, whereas coverage ratios are derived from the relationships between debt servicing commitments and sources of funds for meeting these obligations.

CAPITAL STRUCTURE RATIOS

Various capital structure ratios are:

- Debt-equity ratio.
- Debt-assets ratio.

Debt-equity Ratio

The debt-equity ratio which indicates the relative contributions of creditors and owners can be defined as:

$$\frac{\text{Debt}}{\text{Equity}}$$

Depending on the type of the business and the patterns of cash flows the components in debt to equity ratio will vary. Normally the debt component includes all liabilities including current. The equity component consists of net worth and preference capital. It includes only the preference shares not redeemable in one year. The ratio of long-term debt (total debt-current liabilities) to equity could also be used, but what is important is that consistency is followed when comparisons are made.

For Rainbow-chem Industries the debt-equity ratio is

$$= \frac{110.92}{83.01} = 1.33$$

In the above case the debt-equity ratio stood as 1.33, which implies that the debt portion is more than equity. The debt-equity ratio of the dyes & pigments industry on average is 1.424. In the manufacturing industry a debt-equity ratio of 1.5:1 is considered to be healthy. By normal standards and the industry's standards, by the debt-equity ratio is within the limits. In the heavy engineering industries, petroleum industries, infrastructure industries like railways, airways the ratio may even go more than 3:1 as the capital outlays required are in very huge sums.

In general, the lower the debt-equity ratio, the higher the degree of protection felt by the lenders. One of the limitations of the above ratio is that the computation of the ratios is based on book value. It is sometimes useful to calculate these ratios using market values. At the time of mergers and acquisitions or rehabilitation operations the valuation of the equity and debt will be affected by the basis of computation. For example, a sick company whose equity is initially valued at book values may be a healthy one if its assets are valued at market prices if it has large land property in its books.

The debt-equity ratio indicates the relative proportions of capital contribution by creditors and shareholders. It is used as a screening device in the financial analysis. While analyzing the financial condition of a firm, with a debt-equity ratio of less than 0.50, the analyst can go to other critical areas of analysis. However, if an analysis reveals that debt is a significant amount in the total capitalization further investigation has to be undertaken which will throw light on firm's financial condition, results of operations and future prospects. Thus, analysis of debt-equity ratio has assumed importance in the financial analysis of any firm.

Debt-Asset Ratio

The Debt-Asset ratio measures the extent to which borrowed funds support the firm's assets. It is defined as:

$$\frac{\text{Debt}}{\text{Asset}}$$

The composition of debt portion is same as in the debt-equity ratio.

The denominator in the ratio is total of all assets as indicated in the balance sheet. The type of assets an organization employs in its operations should determine to some extent the sources of funds used to finance them. It is usually held that fixed and other long-term assets should not be financed by means of short-term loans. In fact, the most appropriate source of funds for investment in such kind of assets is equity capital, though financially very sound organization may go for debt finance.

Rainbow-chem's debt-asset ratio for the year 5 is:

$$= \frac{110.92}{193.93} = 0.57$$

A debt-asset ratio of 0.57 implies that 57% of the total assets are financed from debt sources. When we compare this with the industry average debt-asset ratio of (0.69), we find that the firm is having a lower leverage compared to the industry.

There are two major uses of capital structure ratios:

1. To Measure Financial Risk

   One measure of the degree of risk resulting from debt financing is provided by these ratios. If the firm has been increasing the percentage of debt in its capital structure over a period of time, this may indicate an increase in risk for its long-term finance providers. As the debt content increases most of firm's income will go for servicing the debt and net income will be reduced. This will affect the long-term earnings prospects of the company as less funds are reemployed because of increased debt servicing burden.

2. To Identify Sources of Funds

   The firm finances all its requirements either from debt or equity sources. Depending on the risk of different types the amount of requirements from each source is shown by these ratios.

3. To Forecast Borrowing Prospects

   If the firm is considering expansion and needs to raise additional money, the capital structure ratios offer an indication of whether debt funds could be used. If the ratios are too high, the firm may not be able to borrow.

Coverage Ratios

Coverage ratios give the relationship between the financial charges of a firm and its ability to service them. Important coverage ratios are interest coverage ratio, fixed charges coverage ratio and debt-service coverage ratio.

$$\frac{\text{Funds available to meet an obligation}}{\text{Amount of that obligation}}$$

Interest Coverage Ratio

One measure of a firm's ability to handle financial burdens is the interest coverage ratio, also referred to as the times interest-coverage ratio. This ratio tells us how many times the firm can cover or meet the interest payments associated with debt.

$$\text{Interest coverage ratio} = \frac{\text{EBIT}}{\text{Interest expense}}$$

For Rainbow-chem Industries it is equal to

$$= \frac{30.82}{9.58}$$

$$= 3.22$$

The greater the interest coverage ratio, the higher the ability of the firm to pay its interest expense. An interest coverage ratio of 4 means that the firm's earnings before interest and taxes are four times greater than its interest payments.

Fixed Charges Coverage Ratio

Interest coverage ratio considers the coverage of interest of pure debt only. Fixed charges coverage ratio measures debt servicing ability comprehensively because it considers all the interest, principal repayment obligations, lease payments and preference dividends. This ratio shows how many times the pre-tax operating income covers all fixed financing charges.

It is defined as:

$$\frac{\text{Earnings before depreciation, debt interest and lease rentals and taxes}}{\text{Debt interest} + \text{Lease rentals} + \frac{\text{Loan repayment installment}}{(1 - \text{tax rate})} + \frac{\text{Preference dividends}}{(1 - \text{tax rate})}}$$

Fixed charges that are not tax deductible must be tax adjusted. This is done by increasing them by an amount equivalent to the sum that would be required to obtain an after-tax income sufficient to cover such fixed charges. In the above ratio, preference-stock dividend requirement is one example of such non-tax deductible fixed charges. To get the gross amount of preference dividends, it has to be divided by the factor (1 – tax rate). For Rainbow-chem Industries the fixed charges coverage ratio is calculated for the year 5 as follows:

$$= \frac{37.31}{9.58 + \frac{7.37}{0.75}}$$

$$= 1.92$$

For Rainbow-chem there are no lease rental payments and preference dividend payments. The loan repayment has been assumed to be Rs.7.37 crore. The fixed charges coverage ratio of 1.92 indicates that its pre-tax operating income is 1.92 times all fixed financial obligations.

Debt Service Coverage Ratio

Normally used by term-lending financial institutions in India, the debt service coverage ratio, which is a post-tax coverage is defined as:

$$\frac{\text{PAT + Depreciation + Other non-cash charges + Interest on term loan}}{\text{Interest on term loan + Repayment of the term loan}}$$

For Rainbow-chem Industries the debt service coverage ratio for the year 5 is:

$$= \frac{(15.94 + 6.49 + 0 + 9.58)}{(9.58 + 7.37)} = 1.89$$

A DSCR of 1.89 indicates the firm has post-tax earnings which are 1.89 times the total obligations (interest and loan repayment) in the particular year to the financial institution.

Dividend Ratios

The common stockholder is very much concerned about the firm's policy regarding the payment of cash dividends. If the firm is not paying enough dividends the stock may not be attractive to those who are interested in current income from their investment in the company. If the firm is paying excessive dividends, it may not be retaining adequate funds to finance future growth. So depending on the shareholder's aspirations a firm must formulate its dividend policy in a balanced way.

The firm must be liquid and profitable to pay consistent and adequate dividends. Without profits, the firm will not have sufficient resources to give dividends, without liquidity the firm cannot get cash to pay the dividends. In the above respects, two dividend ratios are important. They are dividend pay-out ratio and dividend yield ratio.

DIVIDEND PAY-OUT RATIO

This is the ratio of dividend per share (DPS) to earnings per share (EPS). It indicates what percentage of total earnings are paid to shareholders. The percentage of the earnings that is not paid out (1 – dividend pay-out) is retained for the firm's future needs. There is no guideline as to what percentage of earnings should be declared as dividends and it varies according to firm's fund requirements to support its operations. If the firm is in need of funds, then it may cut the dividends in relation to earnings and on the other hand if the firm finds that it lacks opportunities to use the profits generated, it might increase the dividends. But in both the cases, consistency of dividend payment is important to the shareholders. A detailed discussion on dividend is given in chapter no.12.

DIVIDEND YIELD

This is the ratio of dividends per share (DPS) to market price of the share.

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market price of the share}}$$

This ratio gives current return on one's investment. This is mainly of interest to the investors who are desirous of getting income in the form of dividends. No dividend yield exists for firms which do not declare dividends.

Dividend pay-out and yield for Rainbow-chem Industries are summarized in table 6.8

Table 6.8

Ratio	Year 5	Year 4	Year 3	Year 2	Year 1
DPS	3.50	2.84	2.18	2.40	2.20
EPS	13.68	12.81	8.98	6.70	5.24
Mkt.price	425	450	130	240	80
Div.pay-out	0.26	0.22	0.24	0.36	0.42
Div. yield	0.008	0.006	0.017	0.010	0.0275
P/E	31.06	35.12	14.47	35.82	15.26

Table 6.9

Overall Ownership Analysis

Ratios	Rainbow-chem Ltd.	Dyes & Pigm Ind.
Earnings per share	13.68	
Price-earning multiple	31.06	
Capitalization rate	0.032	
Debt-equity	01.33	1.424
Debt-asset ratio	00.57	00.69
Interest coverage ratio	03.22	02.00
Dividend pay-out	00.26	
Dividend yield	0.008	

Rainbow-chem's EPS has increased from 5.24 in year 1 to 13.68 in year 5 which is reflected in the market prices (from Rs.80 in year 1 to Rs.425 in year 5). Though the dividend yield is very low, the shareholder has gained a lot because of enormous capital appreciation. The debt-equity ratio is below industry average, which highlights low risk nature of the firm. It is also having healthy interest coverage ratios of 3.22 against the industry's ratio of 2.00 which shows its ability in repaying debt obligations. For the owners the leverage ratios indicate below average risk in comparison to the industry. Dividend pay-out ratios have declined from 0.42 in year 1 to 0.26 in year 5, because of expansion projects it has undertaken in year 4. But it is paying dividends consistently over the years, which is very important to some shareholders who expect a regular income. Through capital appreciation it is giving benefits to other shareholders also. In total ownership ratios give a positive picture of the organization.

COMPARATIVE ANALYSIS

In the preceding sections, to find out whether ratios are within the limits or not they were compared across the industry or in few cases against predetermined standards. To get a more meaningful picture of the position of the firm sometimes it is useful to compare its financial information across many players in the industry (cross-sectional analysis) or to compare over a period of time (time series analysis).

The comparison of financial statements is accomplished by taking the individual items of different financial statements and reviewing the changes that have occurred from year-to-year and over the years. The most important factor revealed by comparative financial statements is trend. The comparison of financial statements over a number of years will also reveal the direction, velocity, and the

amplitude of trend. Further analysis can be undertaken to compare the trends in related items. Different types of comparative analysis are:

1. Cross-sectional analysis
2. Time-series analysis
   a. Year-to-year change
   b. Index analysis
3. Common-size analysis.

Cross-Sectional Analysis

To assess whether the financial ratios are within the limits, they are compared with the industry averages or with a good player in normal business conditions if an organized industry is absent. This is called cross-sectional analysis in which industry averages or standard players averages are used as benchmarks.

Table 6.10 gives the cross-sectional analysis of Rainbow-chem Industries against the industry and Atul Products, a good competitor in the Dyes & Pigments Industry for Rainbow-chem Industries.

In the earlier sections, it was found that the Rainbow-chem Industries Ltd., is having an edge in all aspects of financial analysis against the industry. On comparison with Atul Products, it can be found that Atul Products is having better liquidity as per current and quick ratios. Though Atul has low debt-equity and debt-asset ratio, it has low coverage because of low EBIT. In profitability ratios, there is not much difference in GPM and NPM ratios, but in returns ratios Rainbow-chem Industries is far ahead of Atul Products.

Table 6.10

Ratios	Definition	Rainbow-chem Ltd.	Atul Prod.	Dyes & Pigm Ind.
LIQUIDITY				
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	3.31	3.63	3.53
Quick Ratio	$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$	2.04	2.18	2.26
Inventory Turnover	$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$	5.63	3.95	4.61
LEVERAGE				
Debt-equity Ratio	$\frac{\text{Total Debt}}{\text{Net Worth}}$	1.33	0.71	1.424
Debt-asset Ratio	$\frac{\text{Total Debt}}{\text{Total Assets}}$	0.57	0.42	0.69
Interest Coverage Ratio	$\frac{\text{EBIT}}{\text{Interest}}$	3.22	1.81	2.00
PROFITABILITY				
Gross Profit Margin	$\frac{\text{Gross Profit}}{\text{Total Sales}}$	22.69%	10.15%	10.60%
Net Profit Margin	$\frac{\text{Net Profit}}{\text{Total Sales}}$	6.92%	6.14%	6.39%

Ratios	Definition	Rainbow-chem Ltd.	Atul Prod.	Dyes & Pigm Ind.
Return on Equity	$\frac{\text{Net Income}}{\text{Average Equity}}$	20.68%	10.21%	13.18%
Earning Power	$\frac{\text{EBIT}}{\text{Average Total Assets}}$	17.58%	13.87%	14.12%
Assets Turnover	$\frac{\text{Sales}}{\text{Average Assets}}$	1.49	0.71	1.25

Time-Series Analysis

Year-to-Year Change

A comparison of financial statements over two to three years can be undertaken by computing the year-to-year change in absolute amounts and in terms of percentage changes. Longer term comparisons are best illustrated by means of index-number trend series. When a two or three-year comparison is attempted, the presentations are manageable and can be understood by the reader. Comparative financial statements can also be presented in such a way that the cumulative totals for the period for each item under study and the average for that period are shown.

Trends of liquidity and leverage ratios of Rainbow-chem Industries can be illustrated as follows:

Table 6.11

Year	Year 5	Year 4	Year 3	Year 2	Year 1
Current Ratio	3.31	3.78	3.98	2.93	1.94
Quick Ratio	2.04	2.16	2.34	1.60	0.96
Debt to Equity Ratio	1.33	1.20	1.98	3.26	3.50
Interest Coverage Ratio	3.22	2.86	1.90	1.73	1.90

In the above table, we have given two liquidity ratios, and two leverage ratios. Current ratio increased over a period of time. Quick ratio also increased steadily up to year 3 but slightly decreased in the next two years. That is because of initial decrease in the inventory levels up to year 3, and again increase in the inventory levels up to year 5 (can be observed from the balance sheet given in the beginning). One has to look into the causes of increase in the inventory levels which made the quick ratio decrease. Apart from that the overall liquidity has improved. Debt-equity ratio has declined over a period of time and interest coverage ratio also increased which are positive signs. Thus, we can come to conclusions by observing the trends of certain important variables in the financial analysis.

Index Analysis

When a comparison of financial statements covering more than three years is undertaken, the year-to-year method of comparison may become too cumbersome. The best way to understand such longer term trend comparisons is by means of index numbers. The computation of a series of index numbers requires the choice of a base year that will, for all items, have an index amount of 100. Since such a base year represents a frame of reference for all comparisons, it is advisable to choose a year that, is as typical or normal as possible in a business conditions sense.

An important use of this method is that one can see how all the variables of a particular statement are changing over a longer period of time. For example, the index-number

trend series for Rainbow-chem Industries over last five years given in the above table reflects the over-all picture of change at a glance. In summary, an important value of trend analysis is that it can convey to the analyst a better understanding of management's philosophies, policies, and motivations, conscious or otherwise, that have brought about the changes revealed over the years. The more diverse the economic environments covering the periods comparison are, the better a picture can be obtained by the analyst of the ways in which the enterprise has come out of its adversities and taken advantage of its opportunities.

Table 6.12

		Year 1	Year 2	Year 3	Year 4	Year 5
	SOURCES OF FUNDS					
A.	Share Capital	100	100.00	121.28	146.72	146.72
B.	Reserves Total	100	119.24	219.36	352.28	422.49
C.	Total Shareholders Funds (A + B)	100	113.08	188.00	286.54	344.31
D.	Secured Loans	100	174.72	197.67	134.89	158.99
E.	Unsecured Loans	100	79.31	72.48	133.37	177.24
F.	Total Debt (D + E)	100	142.03	157.40	134.40	164.86
G.	Total Liabilities (C + F)	100	133.04	168.27	188.44	225.05
	APPLICATION OF FUND					
H.	Gross Block	100	132.49	160.00	182.87	193.71
I.	Less: Accum. Depreciation	100	109.16	120.55	135.62	141.05
J.	Net Block (H – I)	100	175.66	233.01	270.29	291.16
K.	Capital Work-in-Progress	100	47.00	59.63	68.80	86.00
L.	Investments	100	109.05	109.05	114.33	250.18
M.	Current Assets, Loans & Advances		N + O + P + Q)			
N.	Inventories	100	85.75	84.64	98.25	112.37
O.	Sundry Debtors	100	95.82	118.48	117.07	156.47
P.	Cash and Bank Balances	100	128.57	87.30	128.57	146.82
Q.	Loans and Advances	100	148.26	161.73	215.65	334.78
	TOTAL CURRENT ASSETS		N + O + P + Q)			
R.	Less: Current Liab. & Prov. (S + T)					
S.	Current Liabilities	100	61.59	47.93	53.83	80.92
T.	Provisions	100	101.57	114.21	180.00	223.15
U.	Net Current Assets (M – R)	100	130.56	161.55	176.27	214.85
V.	Total Assets (J + K + L + U)	100	133.04	168.27	188.44	225.05

Common-size Analysis

In the analysis of financial statements, it is often instructive to find out the proportion that a single item represents of a total group or subgroup. In a balance sheet, the assets as well as the liabilities and capital are each expressed as 100 percent, and each item in these categories is expressed as a percentage of the respective totals. Similarly, in the income statement, net sales are set at 100 percent and every other item in the statement is expressed as a percentage of net sales.

Common-size statements are very well suited to inter company comparison because the financial statements of a variety of companies can be recast into the uniform common-size format regardless of the size of individual accounts.

Comparison of the common-size statements of companies within an industry or with common-size composite statistics of that industry can alert the analyst's attention to variations in account structure or distribution.

From the table No. 6.13 we can find that Rainbow-chem has employed more loan funds than Atul Products which implies higher debt-equity ratio. Keeping all the other factors constant, in a tight credit market, Atul Products will be able to get more loans than Rainbow-chem's because of lower debt-equity ratio. Rainbow-chem also has higher proportion of working capital compared to Atul Products. In busy periods this may be useful but in slack period it works against the company. Thus, each and every variable is compared depending on the analyst's motives.

Table 6.13

	Year 5	Year 5
	Rainbow-chem	Atul Products
Liabilities:		
Equity Capital	7.40	9.69
Preference Capital	0.00	0.00
Reserves (Excl. Revaluation Reserves)	45.36	49.90
Revaluation Reserves	0.00	0.00
Shareholders' Funds	52.76	59.59
Secured Loans	30.90	35.18
Unsecured Loans	16.34	523
Loan Funds	47.24	40.41
Total Funds Employed	100.0	100.00
Assets:		
Gross Block	69.95	83.03
Accumulated Depreciation	33.06	34.53
Net Block	36.88	48.50
CWIP	4.37	3.27
Investments	4.21	3.89
Inventory (Total)	29.43	23.85
Sundry Debtors	31.68	17.96
Cash & Bank Balances	1.18	0.77
Loans, Advances & Deposits	14.68	17.44
Total Current Assets	76.97	59.92
Sundry Creditors	20.57	13.68
Other Curr. Liab. & Provisions	2.69	2.87
Total Current Liab	23.26	16.55
Net Current Assets (Cu. Assets – Liab.)	53.71	43.37
Misc. Exp. not w/o	0.82	0.88
Total Assets	100.00	100.00

The common-size analysis can be carried out further and extended to an examination of what proportion of a subgroup, rather than the total, an item is. Thus, in assessing the liquidity of current assets, it may be of interest to know not only what proportion of total assets is invested in inventories but also what proportion of current assets is represented by this asset.

DU PONT ANALYSIS

The Du Pont Company of the US developed a system of financial analysis which has got good recognition and acceptance. Analyzing return ratios in terms of profit margin and turnover ratios, it is referred to as the Du Pont System. The usefulness of the above system can be better understood with the help of an illustration. Let's consider the return on assets ratio. The definition of the return on assets is

$$\text{Return on assets} = \frac{\text{Net Profit}}{\text{Average Assets}}$$

Suppose the return on assets changes from 30 percent to 15 percent. We may conclude either this decreased return is due to a less efficient application of the firm's assets, that is, lower activity or to lower profit margins. As we are interested in assessing the operating performance of the firm to judge about management abilities and future performance, knowing the sources of return is a valuable information.

When both the numerator and the denominator of the return on assets is divided by sales:

$$\text{Return on assets} = \frac{\text{Net profit/sales}}{\text{Average assets/sales}}$$

$$= \text{Net profit margin x Average asset turnover}$$

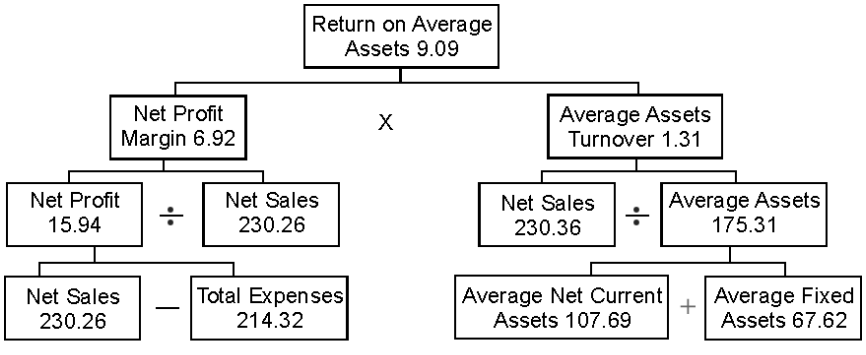
When analyzing a change in return on assets, the analyst could look into the above equation to see changes in its components: net profit margin and total assets turnover.

The ratios of return on assets and margins for Rainbow-chem Industries for the years 5 and 4 are as follows:

Year	Return on assets	Net profit margin	Average asset turnover
5	9.09%	6.92%	1.49
4	10.09%	7.94%	1.27

Net profit margin declined from year 4 to year 5, yet asset turnover improved slightly: from 1.27 to 1.49. Therefore, the decrease in return on assets is attributable to the decrease in net profit margin. If we go further each component of right hand side equation could be broken into parts to find out the cause for change in individual components. With this approach of breaking down into components we can get an overall picture of the changes taking place in the system which will be of great help to the analyst. The following figure shows the Du Pont chart as applied to Rainbow-chem Limited, for the year 5.

Figure 6.1



Du Pont Chart

The left hand side of the Du Pont chart gives the details of the net profit margin ratio. This side is examined to find out whether cost reduction improves the net profit margin. Comparative common-size analysis is used to understand where cost

control efforts should be directed. From the right hand side of the Du Pont chart, we get the details of total assets turnover ratio. In addition to this, if we study the turnover ratios (inventory turnover, fixed assets turnover, etc), an insight can be gained into asset utilization efficiencies.

We can extend the basic Du Pont analysis to analyze the determinants of return on equity (ROE). But the return-on-equity ratios require an adjustment.

We can derive the basic Du Pont equation for return on equity as:

Return on Equity (ROE)

$$\frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Assets}} \times \frac{\text{Average Asssets}}{\text{Average Equity}}$$

The third component of the equation is called equity multiplier. The equity multiplier can be restated in terms of the total debt-to-assets ratio as follows:

$$\text{Equity multiplier} = \frac{\text{Average Assets}}{\text{Average Equity}}$$

$$= \frac{\text{Average Assets}}{\text{Average Assets} - \text{Average Debt}}$$

$$= \frac{1}{1 - (\text{Average Debt}/\text{Average Assets})}$$

$$= \frac{1}{1 - (\text{Debt to Assets Ratio})}$$

This way, we can breakdown each return ratio into its margin and turnover components.

PROBLEMS ENCOUNTERED IN FINANCIAL STATEMENT ANALYSIS

Analysis of financial statements using ratios can be very helpful in understanding a company's financial performance and condition. Yet there are certain problems which come in the way of such an analysis.

Development of Benchmarks

Many companies have operations spread across a number of industries. As no other company may have a presence in the same industries, that too in the same proportion, development of a benchmark becomes a problem. Even when the company is not a diversified one, figures for the various firms are needed in addition to the industry average, in order to draw a meaningful conclusion.

WINDOW-DRESSING

Firms may window-dress the financial statements in order to show a rosy picture. In such a case, the whole exercise of analyzing the statements becomes useless. In order to draw some meaningful results out of the analysis, the average figures over a period of time should be looked into.

PRICE LEVEL CHANGES

Financial statements do not take into account changes in price levels. Analysis of such statements may not give a true picture of the state of affairs.

DIFFERENCES IN ACCOUNTING POLICIES

Different companies may follow different accounting policies in respect of depreciation, stock valuation, etc. Comparison between the ratios of two firms following different policies may not give the true result.

INTERPRETATION OF RESULTS

A problem may arise on two accounts – interpretation of ratio on its own, and interpretation of all the ratios taken together. It is difficult to decide the optimum

level of a ratio, inspite of the presence of industry averages. For example, it is difficult to say whether a high current ratio shows a good liquidity position or an unnecessarily high level of inventories. Secondly, some ratios may be in favor of a company, while some others may be against it. In such a case, it may be difficult to form an overall opinion about the company.

CORRELATION AMONG RATIOS

There may be a high degree of correlation among the various ratios calculated, due to the presence of some common factor. This may make interpretation of all the ratios confusing. Hence it becomes essential to choose a few ratios which can convey the required information.

SUMMARY

- Financial statement analysis involves the application of analytical tools and techniques to the financial data to get information that is useful in decision making. The foundation of any good analysis is a thorough understanding of the objectives to be achieved and the uses to which it is going to be put. Such understanding leads to economy of effort as well as to an useful and most relevant focus on the points that need to be clarified and the estimates and projections that are required.
- Financial statement analysis is oriented towards the achievement of definite objectives. There are three types of users to whom the financial statement analysis could be very useful. They are short-term lenders, long-term lenders and finally stockholders. In this chapter an important tool ratio analysis is covered extensively. Other tools covered are comparative analysis and Du Pont analysis.
- The analysis of a ratio gives the relationship between two variables at a point of time and over a period of time. There are three kinds of ratios and they are liquidity ratios, profitability ratios, ownership ratios.Liquidity ratios measure the short-term liquidity of the firm with the help of ratios like current ratio, quick ratio and turnover ratios. Profitability ratios measure the operational efficiency of the firm. They give the details of how efficient the firm is in applying its resources to get the maximum returns. Ownership ratios help the present or future stockholder in assessing the value of his investment. Earning ratios, leverage ratios (capital structure and coverage ratios) and dividend ratios fall into the category of ownership ratios. Leverage ratios measure the long-term solvency of the firm. They are further divided into capital structure ratios and coverage ratios.
- Du Pont analysis divides a particular ratio into components and studies the effect of each and every component on the ratio. Comparative analysis gives an idea where a firm stands across the industry and studies its financial trends over a period of time. The final step in analysis is the interpretation of the data and measures assembled as a basis for decision and action. This is the most important and difficult of the steps, and requires application of a great deal of judgment, skill, and effort.
- Though there are limitations to financial statement analysis, it is the only means by which the financial realities of an enterprise can be reduced to a common denominator that can be quantified and mathematically manipulated and projected in a rational and disciplined way.

Chapter VII

Funds Flow Analysis

After reading this chapter, you will be conversant with:

- Concept of Funds Flow Statement
- Significance of a Funds Flow Statement

Introduction

We can say that a balance sheet is a "snap shot" view of the affairs of a business, whereas a profit and loss statement is a "motion picture" view of how the change in the owners' equity comes about. However, 'retained earnings' merely forms one of the many balance sheet items. Over time, practically every other item in the balance sheet undergoes a change. For instance additional capital may be brought in, loans may be raised or retired, fixed assets acquired or disposed off, inventories built up or consumed and so on. Also, while a business may show considerable profits in a certain year, there may be practically no cash in the business to meet the operational requirement. Or else, despite borrowing a considerable amount of working capital, the management may still find it difficult to support their inventory. Why does this happen? How does this happen? These are questions which are not answered by either the balance sheet or the profit and loss statement. The financial statement which attempts to answer these questions is the Statement of Changes in Financial Position (SCFP). Other common names for the same statement are: 'Funds Flow Statement', 'Sources and Applications (Uses) of Funds' and 'Cash Flow Statement'. 'The more pretentious names include 'Money Provided and its Disposition', 'Summary of Financial Operations', 'Financial Expansion and Replacement' etc.

CONCEPT OF FUNDS FLOW STATEMENT (FFS)

A funds flow statement is a statement which explains the various sources from which funds were raised and the uses these funds were put to. The reader may notice that this definition of Funds Flow Statement comes disconcertingly close to the definition of a balance sheet. Since liabilities and assets are themselves sources and uses of funds respectively, even a balance sheet itself may be considered as a form of "Funds Flow Statement". One would notice that in fact the balance sheets of most companies are increasingly being expressed in the "Sources of Funds" and "Application of Funds" format. The major difference, however, between a true funds flow statement and a balance sheet is that the former captures the movements in funds, while the latter merely presents a static picture of the sources and uses of funds. On account of this property, a funds flow statement would enable one to see how the business financed its fixed assets, built up the inventory, discharged its liabilities, paid its dividends and taxes and so on. Similarly, it would enable one to see how the business managed to meet the above capital or revenue expenditure. Was it by raising additional capital or loans from public? Was it by stretching the trade creditors or by incurring some other liabilities?

One may wonder as to which of the three, viz. a funds flow statement, a balance sheet or a profit and loss account is more important. This question may be well akin to whether a mango, a banana or an orange is a better fruit. It must be recognized that each statement complements the other in its information content. True, in India there is no statutory obligation for a company to publish a funds flow statement in its annual report, but that should hardly be a reflection on the purpose which the statement serves. Incidentally, the Accounting Principles Board (US) requires the companies to publish the SCFP along with the balance sheet and income statement in their annual report. Even in India, companies are beginning to incorporate the funds flow statement in their annual reports.

Preparation of a Funds Flow Statement (FFS)

The simplest funds flow statement for a period may merely be the difference between the corresponding balance sheet items at the beginning and the end of the period, such that all increases in liabilities and decreases in assets are shown as sources of funds and all decreases in liabilities and increases in assets are shown as applications of funds. Thus, for such a funds flow statement one needs the opening and closing balance sheets of the period for which the statement is to be prepared. However, a more sophisticated FFS can be prepared with the help of the two balance sheets (opening and closing) and the profit and loss statement of the intervening period. Such a funds flow statement defines funds as "total resources" and the sources of funds will always be equal to the uses of funds.

A funds flow statement may be so prepared as to explain only the change in the working capital (current assets – current liabilities) from the beginning of a period to the end of the period. Alternatively it may explain the change in the cash position during the period or it may be prepared so as to indicate the changes in total resources as explained earlier.

In general, it is conventional to record the changes in the assets and liabilities, only if such changes have an impact on the cash or working capital position. For instances, if some land were to be bought in exchange for a company's shares, such a transaction would have no impact on cash or working capital of that company. Hence, conventionally such transactions are excluded from FFS. However, one may also choose to include them under the FFS, if the FFS be regarded as a statement conveying all changes in the assets and liabilities structure of a business. Also, such inclusion may be justified by the fact that even transactions which result in no ostensible change of cash or funds for the business, do have an indirect impact on the cash or funds, though perhaps at a later date.

Let us take a closer look at how a funds flow statements can be prepared on total resources basis, working capital basis and cash basis.

Total Resources Basis

The sources and uses of funds can be summarized as

Sources	Uses
1. Operations	1. Dividends
– Profit after tax	2. Decrease in liabilities
– Depreciation and other non-cash charges.	
2. Issue of equity capital	3. Increase in assets
3. Increase in liabilities	
4. Decrease in assets	

To prepare the funds flow statement for a company on total resources basis, we have to first compare the balance sheets over the period of time in which we are interested and rate the increases and decreases in various assets and liabilities and also see whether the company had any inflow of funds through the issue of equity or preference capital. The profit and loss statements for the years must also be analyzed to calculate the funds from operations (profit after tax to which all non-cash charges like depreciation are added back) and dividend payments. All these information have to be combined to prepare the funds flow statement. It is to be noted that since the change in all items of the balance sheet are considered, the source of funds will always be equal to the use of funds.

Tables 7.1 and 7.2 below present two years of Lamda Company's financial history as captured by its income statements and balance sheets.

Table 7.1
Lamda Company Ltd. Income Statements, Year 1 and Year 2

(in rupees)

	Year 1	Year 2
Sales	515,000	557,500
Cost of goods sold	335,000	355,000
Materials	1,67,500	1,77,500
Labor	77,500	80,000
Overhead	90,000	97,500
Gross Profit	180,000	202,500
Depreciation	7,500	5,000
Selling, general and administrative expenses	149,400	181,100
Operating profit before interest and taxes	23,100	16,400
Interest	8,100	3,900
Profit before tax	15,000	12,500
Tax @ 50%	7,500	6,250
Profit after tax	7,500	6,250

Table 7.2

Lamda Company Ltd. Year-end Balance Sheet

Year 1 and Year 2

(in rupees)

	Year 1	Year 2
Assets		
Cash	1,000	1,000
Accounts receivable	125,000	90,000
Inventory	187,500	180,000
Total current assets	313,500	271,000
Fixed assets net of depreciation	55,000	50,000
Other assets	17,500	15,000
Total assets	386,000	336,000
Liabilities and net worth		
Bills payable	66,200	16,400
Accounts payable	52,500	42,500
Provisions	3,500	6,550
Accruals	15,000	17,500
Total current liabilities	137,200	82,950
Term loan	36,000	34,000
Total liabilities	173,200	116,950
Share capital	155,000	155,000
Reserves + Surplus	57,800	64,050
Total liabilities and net worth	386,000	336,000

Table 7.3 presents the funds flow statement on a total resources basis. Part A of the table is the statement of balance sheet changes for the company over year 1 to year 2. Part B of the table classifies these changes into sources and uses of funds. Part C of the table draws on information provided by the income statements for a more detailed analysis of the flow of funds.

Table 7.3

Part A Statement of Balance Sheet Year 1 and Year 2 changes

	Year 1	Year 2	Change (in rupees)	
Assets				
Cash	1000	1,000	(–)	
Accounts receivable	125,000	90,000	(–)	35,000
Inventory	187,500	180,000	(–)	7,500
Total current assets	313,500	271,000	(–)	42,500
Fixed assets net of depreciation	55,000	50,000	(–)	5,000
Other assets	17,500	15,000	(–)	2500
Total assets	386,000	336,000	(–)	50,000
Liabilities and net worth				
Bills payable	66,200	16,400	(–)	49,800
Accounts payable	52,500	42,500	(–)	10,000
Provisions	3,500	6,550	(+)	3,050
Accruals	15,000	17,500	(+)	2,500
Total current liabilities	137,200	82,950	(–)	54,250
Term loan	36,000	34,000	(–)	2,000
Total liabilities	173,200	116,950	(–)	56,250
Share capital	155,000	155,000		—
Reserves and surplus	57,800	64,050	(+)	6,250
Total liabilities and net worth	386,000	336,000	(–)	50,000

Part B Statement of Sources and Uses of Funds for the Year 2

(in rupees)

Sources	
Reduction in Accounts Receivable	35,000
Reduction in Inventory	7,500
Reduction in Net Fixed Assets	5,000
Reduction in Other Assets	2,500
Increase in Provisions	3,050
Increase in Accruals	2,500
Increase in Reserves and Surplus	6,250
Total Sources	61,800
Uses	
Reduction in Bills Payable	49,800
Reduction in Accounts Payable	10,000
Reduction in Term Loan	2,000
Total Uses	61,800

Part C Funds Flow Statement for the Year 2

(in rupees)

Sources		
Profit before tax		12,500
Depreciation		5,000
Increase in Liabilities:		
Provisions	3,050	
Accruals	2,500	5,550
Decrease in Assets:		
Accounts Receivable	35,000	
Inventory	7,500	
Gross Fixed Assets	0*	
Sources		
Other Assets	2,500	45,000
		68,050
Uses		
Taxes		6,250
Dividends	–	–
Decrease in Liabilities:		
Bills Payable	49,800	
Accounts Payable	10,000	
Term Loan	2,000	61,800
Increase in Assets	–	–
		68,050

* When depreciation is shown as a source of funds, the changes in gross fixed assets must be analyzed to see whether funds have been generated or used. For this purpose, from the given data, gross fixed assets can be calculated as:

Gross Fixed Assets = Net Fixed Assets + Accumulated Depreciation

	Year 1	Year 2
Gross Fixed Assets	62,500	62,500
Accumulated Depreciation (7,500 + 5,000)	7,500	12,500
Net Fixed Assets	55,000	50,000

Students will note that the gross fixed assets will not change usually unless there is a purchase or sale of a fixed asset, or the company changes its method of depreciation.

Interpreting the Funds Flow Statement

What do we learn from source-and-use analysis? Let us take a look at Part B of table 7.3 We see that all the assets of the company have decreased over the period, leading to a source of funds. Why are decrease in assets treated as a source? When an asset account increases, it uses funds as funds are required for their purchase. Correspondingly, when an asset account decreases, it releases or provides funds and hence becomes a source. Similarly, when a liability account increases, it provides funds (acts as a source), when it decreases, funds are required to make the reduction (the account uses up funds). Lamda Company has increased its provisions, accruals and reserves which generated funds to the extent of Rs.11,800 and additional funds to the extent of Rs.50,000 were generated by a decrease in assets. The amounts so released have been used up by the company in paying off its creditors (Bills Payable Rs.49,800 and Accounts Payable Rs.10,000) and also in repaying Rs.2,000 towards term loan.

A deeper look at the funds flow statements reveals that the largest source of funds was from Accounts Receivable by Rs.35,000. Is this an indicator that the company follows efficient receivable management techniques? A major use of funds have been in paying off short-term creditors for supplies. In spite of apparently efficient working capital management, we notice that there has been no increase in cash. Is this because the management is following an aggressive working capital policy? Or is it an indicator of liquidity problems in the years to come? We cannot come to any valid conclusions with the data given, but we can definitely get an insight into those areas which require further investigation.

FUNDS FLOW STATEMENT ON A CASH BASIS

A funds flow statement on cash basis is prepared by:

- Classifying net balance sheet changes that are seen between two points in time into changes that increase and decrease cash.
- Classifying from the income statement the factors that increase and decrease cash.
- Consolidating this information into a source and use of funds format.

The steps are similar to those while preparing a funds flow statement on total resources basis, but here, instead of classifying increase/decrease in cash as use or source, all the other increases and decreases are classified into sources and uses, and if sources exceed uses, there has been an increase in cash to that extent and on the other hand, if uses exceed sources, there has been a decrease in cash to that extent. In the earlier illustration of Lamda Company, we can see that there has been no increase in cash.

Let us take a closer look at the sources of funds that increase cash and the uses of funds that decrease cash. Sources of funds that increase cash are:

- A net decrease in any asset other than cash or fixed assets.
- A gross decrease in fixed assets.
- A net increase in any liability.
- Proceeds from the sale of equity or preference stock.
- Funds from operations.

Funds from operations are not expressed directly in the income statement. In order to get funds from operations, depreciation has to be added back to profit after taxes. If on the other hand, depreciation is added back to profit before taxes, taxes have to be shown separately as a use of funds.

Uses of funds which decrease cash include:

- A net increase in any asset other than cash or fixed assets.
- A gross increase in fixed assets.
- A net decrease in any liability.
- A retirement or purchase of stock.
- Cash dividends.

- To illustrate the preparation of the funds flow statement on a cash basis, we shall use the balance sheet and income statements of Alpine Resorts Ltd., as shown in Table 7.4 and 7.5 below:

Table 7.4
Alpine Resorts Ltd's Balance Sheet as on 31st March

(in rupees '000)

	Year 1	Year 2
Assets		
Fixed Assets at Cost	1,538,495	1,596,886
Less: Accumulated Depreciation	791,205	856,829
Net Fixed Assets	747,290	740,057
Long-term Investments	–	65,376
Other Assets	205,624	205,157
Current Assets		
Inventories	1,234,725	1,328,963
Accounts Receivable	740,705	678,279
Pre-paid Expenses	17,197	20,756
Other Current Assets	29,165	35,203
Cash & Marketable Securities	175,042	177,689
	2,196,834	2,240,890
Total Assets	3,149,748	3,251,480
Liabilities & Net Worth		
Share Capital	781,883	781,986
Reserves & Surplus	956,361	1,014,635
Total Owner's Equity	1,738,244	1,796,621
Long-term Loans	626,460	630,783
Current Liabilities:		
Bills Payable	356,511	448,508
Accounts Payable	136,793	148,427
Accrued Taxes	127,455	36,203
Outstanding	164,285	190,938
	785,044	824,076
Total Liabilities & Net worth	3,149,748	3,251,480

Table 7.5
Alpine Resorts Ltd's Income Statements for the years ended 31st March

(in rupees '000)

	Year 1	Year 2
Net sales	3,721,241	3,946,873
Cost of goods sold	2,499,965	2,680,298
Selling, general or administrative expenses	726,959	801,395
Depreciation	113,989	65,624
Interest	69,764	85,274
Profit before tax	310,564	314,282
Income tax	172,446	163,708
Profit after tax	138,118	150,574
Cash dividends	88,634	92,300
Retained earnings	49,484	58,274

Before we prepare the funds flow statement, let us calculate funds from operations and the gross change in fixed assets.

Funds from operations

(in rupees '000)

Net income after taxes	150,574
Add: Depreciation and other non-cash expenses	65,624
Funds from operations	216,198

Gross Change in Fixed Assets

Since depreciation has been already shown as a source of funds, in order to avoid double counting, we compute gross changes in fixed assets by adding depreciation for the period to net fixed assets at the ending financial statement date. From this figure, the net fixed assets at the beginning financial statement date is deducted.

The residual represents the gross change in fixed assets, which, if positive (as is usually the case) represents a use of funds; if negative, a source.

In this illustration, gross change in fixed assets can be calculated as follows:

Gross change in fixed assets = Rs.7,40,057 + Rs.65,624 – Rs.7,47,290 = Rs.58,391

Since this is a positive figure, it indicates a use of funds or in other words, additions to fixed assets.

Once all sources and uses are computed, they may be presented as:

Funds Flow Statement of Alpine Resorts Ltd.

Year 1 to Year 2

(in rupees '000)

Sources of Cash		
Funds from operations		216,198
Net decrease in assets:		
(Other than fixed assets and cash)		
Other assets	467	
Accounts receivable	62,426	62,893
Increase in liabilities:		
Long-term loans	4,323	
Bills payable	91,997	
Accounts payable	11,634	
Outstandings	26,653	134,607
Increase in share capital		103
		413,801
USES OF CASH		
Additions to fixed assets		58,391
Dividends paid		92,300
Net increase in assets:		
(Other than fixed assets and cash)		
Inventories	94,238	
Pre-paid expenses	3,559	
Other current assets	6,038	103,835
Increase in investments		65,376
Decrease in liabilities		
Accrued taxes		91,252
		411,154
Increase in cash		2647

We find that when we substract the total sources of cash from the total uses of cash, the difference (increase of Rs.2,647) is equal to the actual change in cash between the two balance sheet dates as shows in table 7.4. This tallying is a must. If there is a discrepancy in the figure of change in cash as indicated by the funds flow statement and the financial statements, the analyst must search for the cause of discrepancy. Frequently discrepancies will occur due to surplus adjustments and the analyst should be alert to this possibility.

From the funds flow statement of Alpine Resorts Ltd., the principal uses of funds for year 2 were additions to fixed assets, increases in inventories and investments and a sizeable decrease in taxes payable. These uses were financed primarily by funds provided by operations after payment of dividends, a decrease in accounts receivable and by increases in bank loans, payable and outstandings.

Funds Flow Statement – Working Capital Basis

The preparation of a statement showing the source and use of working capital is very similar to the preparation of a funds flow statement on a cash basis. The only difference between the two is that in the former, changes in the various

components of current assets and current liabilities are omitted and greater attention is given to changes in fixed assets and long-term liabilities.

This statement is frequently used by bankers to determine whether the minimum working capital requirement is being maintained by borrowers who come to them for working capital loans.

Such a statement is also an internal control device often used by managements.

Students may note the following points:

- An increase in a current asset results in an increase in working capital.
- A decrease in a current asset results in a decrease in working capital.
- An increase in a current liability results in a decrease in working capital.
- A decrease in a current liability results in an increase in working capital.

The funds flow statement of Alpine Resorts on working capital basis can be prepared as:

Alpine Resorts Ltd. Sources and Uses of Working Capital Year 1 to Year 2

(in Rupees)

Source of working capital	
Funds from operations	216,198
Decrease in other assets	467
Increase in share capital	103
Increase in long-term loans	4,323
	221,091
Uses of Working Capital	
Dividends	92,300
Additions to fixed assets	58,391
Increase in investments	65,376
	216,067
Net Increase in Working Capital	5,024

In order to check the accuracy of the net change whether positive or negative, as disclosed by the funds flow statement, students may prepare a schedule of changes in working capital as shown below:

Schedule of Changes in Working Capital

Current Assets	Increase (+)	Decrease (–)
Inventories	94,238	
Pre-paid expenses	3,559	
Other current assets	6,038	
Cash	2,647	
Accounts receivable		62,426
Current Liabilities		
Bills payable		91,997
Accounts payable		11,634
Outstandings		26,653
Accrued taxes	91,252	
	1,97,734	1,92,710
Increase in working capital		5,024
Total	1,97,734	1,97,734

SIGNIFICANCE OF A FUNDS FLOW STATEMENT

We can see that an analysis of the sources and uses of funds provides valuable insights into the operations of a firm. These can be summarized as:

Detection of Imbalances and Appropriate Action

For Example, an analysis spanning several years might reveal a growth in inventories which is out of proportion with the growth of other assets and sales. This over stocking of inventories would have gradually led to a decline in profitability as the funds locked up in inventories could have been put to more profitable uses. This inefficiency in inventory management can be corrected before it leads to further losses.

Divisional Performance Appraisal

When a company has a number of divisions, individual funds statements will enable top management to appraise the performance of divisions in relation to the funds committed to each division.

Evaluation of the Firm's Financing

An analysis of the major sources of funds in the past reveals what portion of the firm's growth was financed internally and what portion externally. A funds flow analysis will also tell us whether short-term liabilities have been used to finance fixed assets and permanent portion of working capital, in which case, at least in the future, the mix of short-term and long-term finance has to be strictly watched over.

Planning of Future Financing

An analysis of a funds flow statement for the future (projected funds flow statement) will reveal the firm's total prospective need for funds when these needs will arise and how these are to be financed depending on whether the need is for fixed assets, fluctuating component of working capital etc.

Thus funds flow analysis is a very important analytical tool in the hands of the Finance Manager in developing information to be used in financial decision-making.

SUMMARY

- A funds flow statement explains the various sources from which funds are raised and the uses to which these funds are put to in a particular year within a company. Although, the definition is quite similar to that of a balance sheet, the difference between a balance sheet and a funds flow statement is that the latter captures the movements in funds, while the former presents a static picture of the sources and uses of funds.
- Funds flow statements can be prepared on total resources basis, cash basis or working capital basis depending upon the requirement of the user. To prepare the funds flow statement for a company on total resources basis, one has to compare the balance sheets over the period of time that one wants. The increases and decreases in various assets and liabilities are calculated while taking into consideration the inflow through issue of equity or preference capital. The profit and loss statements for those years must also be analyzed to calculate the funds from operations and dividend payments. While funds from operations, issue of new capital, increase in liabilities and decrease in assets form the sources of funds for the period, dividend payments, decrease in liabilities and increase in assets form the uses of funds.
- A funds flow statement on cash basis is prepared by classifying net balance sheet changes between two points in time into changes that increase and decrease cash as well as classifying the increase and decrease in cash from the factors available in the income statement. A net decrease in any current asset other than cash, a gross decrease in fixed assets, a net increase in any liability, proceeds from sale of equity/preference stock and funds from operations form the sources of cash. On the other hand, a net increase in any current asset other than cash, a gross in fixed assets, a net decrease in any liability a retirement or purchase of stock and cash dividends form the uses of cash.
- Preparing a funds flow statement on a working capital basis is very similar to preparing a statement on cash basis, the only difference being that the former makes use of changes in the various components of current assets and liabilities and not just cash. In this case, an increase in current assets or a decrease in current liabilities results in increase in working capital, while a decrease in current assets or an increase in current liabilities results in decrease in working capital.
- Funds flow statements are very helpful in detecting any imbalances in inventory management, assisting in appraisal of divisional performance, evaluating the firm's financing options and planning for future financing.

Chapter VIII

Leverage

After reading this chapter, you will be conversant with:

- The Concept of Leverage
- Measures of Leverage

THE CONCEPT OF LEVERAGE

Leverage in the general sense means influence of power i.e., utilizing the existing resources to attain something else. Leverage in terms of financial analysis is the influence which an independent financial variable has over a dependent/related financial variable. When leverage is measured between two financial variables it explains how the dependent variable responds to a particular change in the independent variable. To explain further, let X be an independent financial variable and Y its dependent variable, then the leverage which Y has with X can be assessed by the percentage change in Y to a percentage change in X.

$$LY/LX = \frac{\Delta Y/Y}{\Delta X/X}$$

where

LY/LX	–	measure of the leverage which dependent Y has with independent X
ΔX	–	change in X
ΔY	–	change in Y
$\Delta X/X$	–	percentage change in X
$\Delta Y/Y$	–	percentage change in Y

MEASURES OF LEVERAGE

To better understand the importance of leverage in financial analysis, it is imperative to understand the three measures of leverage.

- Operating Leverage
- Financial Leverage
- Combined/ Total Leverage.

These three measures of leverage depend to a large extent on the various income statement items and the relationship that exists between them. Given below is the Income Statement of XYZ Company Ltd. and the relationship that exits between the various items of the statement:

Income Statement of XYZ Company Ltd.

Item	Amount (Rs.)
Total Revenue	25,00,000
Less:Variable Expenses (V)	10,00,000
Fixed Expenses (F)	9,00,000
Earnings Before Interest & Tax (EBIT)	6,00,000
Less: Interest on Debt (I)	75,000
Profit Before Tax (PBT)	5,25,000
Less:Tax @ 50% (T)	2,62,500
Profit After Tax (PAT)	2,62,500
Less: Preference dividend (D_p)	50,000
Equity Earnings	2,12,500

Total Revenue = Quantity Sold (Q) x Selling Price (S)

Hence,

$$EBIT = Q \times S - Q \times V - F = Q(S - V) - F \quad \ldots.(i)$$

$$EPS = [(EBIT - I)(1 - T) - D_p]/N \quad \ldots.(ii)$$

$$= \frac{[Q(S - V) - F - I](1 - t) - D_p}{N} \quad \ldots.(iii)$$

where N = No. of Equity Shareholders

The above three equations [(i), (ii) and (iii)] which establish the relationship between the various items of the Income Statement form the base for the measurement of the different leverages.

Operating Leverage

Operating leverage examines the effect of the change in the quantity produced on the EBIT of the company and is measured by calculating the Degree of Operating Leverage (DOL).

DOL = Percentage change in EBIT/Percentage change in Output

$$= \frac{\Delta EBIT/EBIT}{\Delta Q/Q}$$

From Eq(i) EBIT = Q(S – V) – F

Substituting for EBIT, we get

DOL = [Q(S – V)] / [Q(S – V) – F] ….(iv)

Illustration 8.1

Calculate the DOL for XYZ Company Ltd. given the following additional information:

Quantity produced	=	5,000
Variable cost per unit	=	Rs.200
Selling price per unit	=	Rs.500
Fixed asset	=	Rs.9,00,000

DOL of XYZ Company Ltd.

= [5,000(500 – 200)]/[5,000(500 – 200) – 9,00,000] = 2.50

APPLICATION AND UTILITY OF THE OPERATING LEVERAGE

It is important to know how the operating leverage is measured, but equally essential is to understand its application and utility in financial analysis. To understand the application of DOL one has to understand the behavior of DOL vis-à-vis the changes in the output by calculating the DOL at the various levels of Q.

Following are the different DOL for the various levels of Q for XYZ Company Ltd.:

Quantity Produced	Degree of Operating Leverage
1000	–0.5
2000	–2.0
3000	∞
4000	4.0
5000	2.5

When the value of Q is 3000 the EBIT of the company is zero and this is the operating break-even point. Thus, at operating break-even point, where the EBIT is zero, the quantity produced can be calculated as follows:

Q = F/(S – V)

For XYZ Company Ltd.:

Q = 9,00,000/(500 – 200) = 3,000

After measuring the DOL for a particular company at varying levels of output the following observations can be made:

- Each level of output has a distinct DOL.
- DOL is undefined at the operating break-even point.
- If Q is less than the operating break-even point, then DOL will be negative (which does not imply that an increase in Q leads to a decrease in EBIT).
- If Q is greater than the operating break-even point, then the DOL will be positive. However, the DOL will start to decline as the level of output increases and will reach a limit of 1.

IMPLICATIONS

Determining Behavior of EBIT

DOL helps in ascertaining change in operating income for a given change in output (quantity produced and sold). If the DOL of a firm is say, 2, then a 10% increase in the level of output will increase operating income by 20%. A large DOL indicates that small fluctuations in the level of output will produce large fluctuations in the level of operating income.

In Table 8.1, two firms with different cost structures are compared.

Table 8.1
Cost and Profit Schedules for
Bell Metal Works and Fibre Glass Ltd.

Bell Metal Works				Fibre Glass Limited			
Units Produced & Sold	Sales	Total Operating Cost	EBIT	Units Produced & Sold	Sales	Total Operating Cost	EBIT
Q	PQ			Q	PQ		
			(In Rupees)			(In Rupees)	
10,000	1,00,000	1,60,000	(60,000)	10,000	1,00,000	2,40,000	(1,40,000)
20,000	2 ,00,000	2,30,000	(30,000)	20,000	2,00,000	2,90,000	(90,000)
30,000	3,00,000	3,00,000	0	30,000	3,00,000	3,40,000	(40,000)
40,000	4,00,000	3,70,000	30,000	40,000	4,00,000	3,90,000	10,000
50,000	5,00,000	4,40,000	60,000	50,000	5,00,000	4,40,000	60,000
60,000	6,00,000	5,10,000	90,000	60,000	6,00,000	4,90,000	1,10,000
70,000	7,00,000	5,80,000	1,20,000	70,000	7,00,000	5,40,000	1,60,000
80,000	8,00,000	6,50,000	1,50,000	80,000	8,00,000	5,90,000	2,10,000
Unit Selling Price (P) = Rs.10				Unit Selling Price (P) = Rs.10			
Operating Fixed Costs (F) = Rs.90,000				Operating Fixed Costs (F) = Rs.1,90,000			
Unit Variable Operating Cost (V) = Rs.7				Unit Variable Operating Cost (V) = Rs.5			
EBIT Break-even Point = 30,000 units				EBIT Break-even Point = 38,000 units			

From table 8.1, we can see that Bell Metal Works has lower fixed costs and higher variable cost per unit when compared to Fibre Glass Limited. The selling price per unit (P) of both firms is the same, viz., Rs.10. An interesting point we notice is that at an output of 50,000 units both firms have the same profit i.e., Rs.60,000. However, as sales fluctuate, the EBIT of Bell Metal Works fluctuates far less than the EBIT of Fibre Glass Limited. This brings us to the conclusion that the DOL of Fibre Glass Limited is greater than the DOL of Bell Metal Works. Let us compute the DOL of these two firms at an output of 50,000 units.

For Bell Metal Works:

$$DOL = [50,000\ (10 - 7)] / [50,000\ (10 - 7) - 90,000]$$
$$= 2.5$$

For Fibre Glass Limited:

$$DOL = [50,000\ (10 - 5)] / [50,000(10 - 5) - 1,90,000]$$
$$= 4.17$$

The figures prove our conclusion to be right.

- **Measurement of Business Risk:** We know that the greater the DOL, the more sensitive is EBIT to a given change in unit sales, i.e. the greater is the risk of exceptional losses if sales become depressed. DOL is therefore a measure of the firm's business risk. Business risk refers to the uncertainty or variability of the firm's EBIT. So, every thing else being equal, a higher DOL means higher business risk and vice-versa.
- **Production Planning:** DOL is also important in production planning. For instance, the firm may have the opportunity to change its cost structure by introducing labor–saving machinery, thereby reducing variable labor overhead while increasing the fixed costs. Such a situation will increase DOL. Any method of production which increases DOL is justified only if it is highly probable that sales will be high so that the firm can enjoy the increased earnings of increased DOL.

Financial Leverage

While operating leverage measures the change in the EBIT of a company to a particular change in the output, the financial leverage measures the effect of the change in EBIT on the EPS of the company. Financial leverage also refers to the mix of debt and equity in the capital structure of the company. The measure of financial leverage is the Degree of Financial Leverage (DFL) and it can be calculated as follows:

DFL = (percentage change in EPS)/ (percentage change in EBIT)

DFL = $(\Delta EPS/EPS)/(\Delta EBIT/EBIT)$

Substituting Eq (ii) for EPS we get,

$$DFL = \frac{EBIT}{EBIT - I - \frac{Dp}{(1 - T)}} \quad \text{....Eq.(v)}$$

Take the example of XYZ Company Ltd., which has an EBIT of Rs.6,00,000 at 5,000 level of production, the capital structure of the company is as follows:

Capital Structure	Amount (Rs.)
Authorized Issued and Paid-up Capital	
500000 Equity Shares @ Rs.10 each	50,00,000
15% Debentures	5,00,000
10% Preference Shares	
5000 Preference Shares @ Rs.100	5,00,000
Total	60,00,000

Let us now calculate the DFL of XYZ Company Ltd.

Earnings Before Interest and Tax (EBIT) = Rs.6,00,000
Interest on Long-term Debt (I) = Rs.75,000
Preference Dividend (D_p) = Rs.50,000
Corporate Tax (T) = 50%

$$DFL = \frac{6,00,000}{6,00,000 - 75,000 - \frac{50,000}{1 - 0.5}}$$

$$= 1.41$$

APPLICATION AND UTILITY OF THE FINANCIAL LEVERAGE

Financial leverage when measured for various levels of EBIT will aid in understanding the behavior of DFL and also explain its utility in financial decision making. Consider the case of XYZ Company Ltd. and measure DFL for varying levels of EBIT.

EBIT (Rs.)	DFL
50,000	–0.40
1,00,000	–1.33
1,75,000	∞
6,00,000	1.41
7,00,000	1.33
7,50,000	1.30

The DFL at EBIT level of 175000 is undefined and this point is the Financial Break-even Point. It can be defined as:

$$EBIT = I + D_p/(1 - T)$$

The following observations can also be made from studying the behavior of DFL.

- Each level of EBIT has a distinct DFL.
- DFL is undefined at the financial Break-even Point.
- DFL will be negative when the EBIT level goes below the Financial Break-even Point.
- DFL will be positive for all values of EBIT that are above the Financial Break-even Point. This will however start to decline as EBIT increases and will reach a limit of 1.

By assessing the DFL one can understand the impact of a change in EBIT on the EPS of the company. In addition to this it also helps in assessing the financial risk of the firm.

Impact of Financial Leverage on Investor's Rate of Return

Let us see with the help of a very simple example, how financial leverage affects return on equity. A company needs a capital of Rs.10,000 to operate. This money may be brought in by the shareholders of the company. Alternatively, a part of this money may also be brought in through debt financing. If the management raises Rs.10,000 from shareholders, the company is not financially leveraged and would have the following balance sheet.

Liabilities	Rs.	Assets	Rs.
Equity Capital	10,000	Cash	10,000

The company commences operations which leads to the preparation of the following simplified version of its income statement.

	Rs.
Sales	10,000
Expenses	7,000
EBIT	3,000
Tax @ 50%	1,500
Net Profit	1,500

What is the return the company has earned on the owner's investment? We see that the return on equity is 15%. The net profit of Rs.1,500 may be paid fully or partly to the shareholders as dividends or may be retained to finance future activities of the company. Either way the Return on Equity is 15%.

What happens to the owner's rate of return if the management decides to finance a part of the required total investment (Rs.10,000) through debt financing? The answer to this question depends on

- The proportion of total investment which the management decides to finance through debt (Debt Equity Ratio the firm aspires to), and
- The interest rate on borrowed funds.

If the management has decided on a Debt Equity Ratio of 2:1, total borrowings will amount to $10,000 \times \frac{2}{3}$ = Rs.6,667. Assuming that the company is able to raise this amount at an interest rate of say, 15%, the company's balance sheet will appear as follows:

Liabilities	Rs.	Assets	Rs.
Equity Capital	3,333	Cash	10,000
Debt Capital	6,667		
	10,000		10,000

The company now has an added financial burden of payment of interest on the amount it has borrowed. The income statement will now show as follows:

	Rs.
Sales	10,000
Expenses	7,000
EBIT	3,000
Interest Charges	1,000
Profit before Tax (PBT)	2,000
Tax @ 50%	1,000
Net Profit	1,000

The use of debt in the company's capital structure has caused the net profit to decline from Rs.1,500 to Rs.1,000. But has the return on owner's capital declined? Return on Equity now works out to 30%, as the owners have invested only Rs.3,333 now which earned them Rs.1,000. What were the factors which contributed to this additional return? We can trace out two sources of this additional return:

- though the company has to pay interest at 15% on borrowed capital, the company's operations have been able to generate more than 15% which is being transferred to the owners.
- the reduction in PBT has brought about a reduction in the amount of tax paid, as interest is a tax deductible expense, to the extent of Interest (1 – tax rate) i.e., Rs.500. The greater the tax rate, the more is the tax shield available to a company which is financially leveraged.

As was seen in the above example, a company may increase the return on equity by the use of debt i.e., the use of financial leverage. By increasing the proportion of debt in the pattern of financing i.e., by increasing the debt-equity ratio, the company should be able to increase the return on equity.

Financial Leverage and Risk

If increased financial leverage leads to increased return on equity, why do companies not resort to ever increasing amounts of debt financing? Why do financial and other term lending institutions insist on norms for Debt-Equity Ratio? The answer is that as the company becomes more financially leveraged, it becomes riskier, i.e., increased use of debt financing will lead to increased financial risk which leads to:

- Increased fluctuations in the return on equity.
- Increase in the interest rate on debts.

Increased Fluctuations in Returns

In the previous example, let us assume that sales decline by 10% (from Rs.10,000 to Rs.9,000), expenses remaining the same. What happens to return on equity? The income statements for the financially unleveraged and leveraged firms will appear as follows:

	Unleveraged Firm (zero Debt)	Leveraged Firm (Debt-Equity Ratio 2 : 1)
Sales	9,000	9,000
Expenses	7,000	7,000
EBIT	2,000	2,000
Interest Charges	–	1,000 (6667 x 0.15)
PBT	2,000	1,000
Tax @50%	1,000	500
Net Profit	1,000	500
Net Profit at Sales of Rs.10,000	1,500	1000
ROE at Sales of Rs.10,000	15%	30%
ROE at Sales of Rs.9,000	10%	15%

We see that a 10% decline in sales produces substantial declines in earnings and the rates of return on owner's equity in both cases. But the decline is greater for the financially leveraged firm than for the financially unleveraged firm. Why is this so? The reason can be traced to the fact that once a firm borrows capital, interest payments become obligatory and hence fixed in nature. The same interest payment which was the cause for increase in owner's equity when sales were Rs.10,000 is now the cause for its more than proportional decline with a decline in sales. Hence, the greater the use of financial leverage, the greater the potential fluctuation in return on equity.

INCREASE IN INTEREST RATES

Firms that are highly financially leveraged are perceived by lenders of debt as risky. Creditors may refuse to lend to a highly leveraged firm or may do so only at higher rates of interest or more stringent loan conditions. As the interest rate increases, the return on equity decreases. However, even though the rate of return diminishes, it might still exceed the rate of return obtained when no debt was used, in which case financial leverage would still be favorable.

IMPLICATIONS

Let us again refer to our earlier example. In the first situation, the company was unleveraged, in the second situation the debt-equity ratio was 2:1. The balance sheet and income statements are reproduced below:

Balance Sheets

Unleveraged			Leveraged		
Liabilities	Assets		Liabilities	Assets	
Equity Capital	10,000 Cash	10,000	Equity Capital	3,333 Cash	10,000
			Debt	6,667	
	10,000	10,000		10,000	10,000

Income Statements

	Unleveraged	Leveraged
Sales	10,000	10,000
Expenses	7,000	7,000
EBIT	3,000	3,000
Interest	–	1,000
PBT	3,000	2,000
Tax @ 50%	1,500	1,000
Net Profit	1,500	1,000

The Degree of Financial Leverage (DFL) in each case is calculated as:

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT} - \text{I} - \frac{D_p}{1-T}}$$

$$\text{Unleveraged} = \frac{3{,}000}{3{,}000} = 1$$

$$\text{Leveraged} = \frac{3{,}000}{3{,}000 - 1{,}000} = 1.5$$

What do these figures imply? They imply that if EBIT is changed by 1%, EPS will also change by 1%, if the company uses no debt. However, EPS changes by 1.5% when it uses debt in the ratio of 2:1 (66.67% of total capital). This is proof of what we have stated earlier: The greater the leverage, the wider are fluctuations in the return on equity and the greater is the financial risk the company is exposed to. Through an EBIT-EPS analysis, we can evaluate various financing plans or degrees of financial leverage with respect to their effect on EPS.

Total Leverage

A combination of the operating and financial leverages is the total or combined leverage. Thus, the degree of total leverage (DTL) is the measure of the output and EPS of the company. DTL is the product of DOL and DFL and can be calculated as follows:

DTL = % change in EPS / % change in output

= $(\Delta EPS/EPS)/(\Delta Q/Q)$

$$DTL = DOL \times DFL$$

$$= \{[Q(S - V)]/[Q(S - V) - F]\} \times \{[Q(S - V) - F]/Q(S - V) - F - I - [D_p/1 - T)]\}$$

$$= \frac{Q(S - V)}{Q(S - V) - F - I - \frac{D_p}{(1 - T)}}$$

Calculating the DTL for XYZ Co. Ltd. given the following information:

Equity Earnings	=	Rs.1,62,500
Quantity Produced (Q)	=	5000 Units
Variable Cost per unit (V)	=	Rs.200
Selling Price per unit (S)	=	Rs.500
Number of Equity Shareholders (N)		5,00,000
Fixed Expenses (F)	=	Rs.9,00,000
Interest (I)	=	Rs.75,000
Preference Dividend (D_p)	=	Rs.50,000
Corporate Tax (T)	=	50%

$$DTL = \frac{5,000(500 - 200)}{5,000(500 - 200) - 9,00,000 - 75,000 - \frac{50,000}{(1 - 0.5)}}$$

$$= 3.53$$

$$DTL = DOL \times DFL$$

$$= 2.5 \times 1.41 = 3.53$$

Thus, when the output is 5,000 units, a one percent change in Q will result in 3.5% change in EPS.

APPLICATIONS AND UTILITY OF TOTAL LEVERAGE

Before understanding what application the total leverage has in the financial analysis of a company, let us make a few more observations by studying its behavior. Let us calculate the overall break-even point and the DTL for the various levels of Q, given the following information:

F = Rs.8,00,000

I = Rs.80,000

D_p = Rs.60,000

S = Rs.1,000

V = Rs.600

The overall break-even point is that level of output at which the DTL will be undefined and EPS is equal to zero. This level of output can be calculated as follows:

$$Q = \frac{F + I + \frac{Dp}{(1 - T)}}{(S - V)}$$

$$= [8,00,000 + 80,000 + 60,000/(1 - 0.5)]/ (1,000 - 600)$$

$$= 2,500.$$

Thus, the overall break-even point is at 2500 units.

Calculating DTL for various levels of output with the given information:

Q	DTL
1000	–0.67
2000	–4.00
2500	∞
3000	6.00
5000	2.00

The following observations can be made from the above calculations:

- There is a unique DTL for every level of output.
- At the overall break-even point of output the DTL is undefined.
- If the level of output is less than the overall break-even point, then the DTL will be negative.
- If the level of output is greater than the overall break-even point, then the DTL will be positive. DTL decreases as Q increases and reaches a limit of 1.

Further, the DTL has the following applications in analyzing the financial performance of a company:

1. Measures changes in EPS: DTL measures the changes in EPS to a percentage change in Q. Thus, the percentage change in EPS can be easily assessed as the product of DTL and the percentage change in Q. For example, if DTL for Q of 3000 units is 6 and there is a 10% increase in Q, the affect on EPS is 60%.

   Percentage change in EPS = DTL (Q = 3,000) x Percent change in Q

   = 6 x 10%

   = 60%

2. Measures Total Risk: DTL measures the total risk of the company since it is a measure of both operating risk and total risk. Thus, by measuring total risk, it measures the variability of EPS for a given error in forecasting Q.

SUMMARY

- Leverage literally means the use of influence to attain some end. In the world of finance, there are three measures of leverage – operating leverage, financial leverage and total leverage.
- Operating leverage examines the effect of the change in quantity produced upon the EBIT of a company and is useful in analyzing the behavior of a company's EBIT over a period of time, measuring business risk and production planning. On the other hand, financial leverage measures the effect of the change in EBIT on the EPS of the company. It also refers to the mix of debt and equity in the capital structure of the company. Financial leverage can be used to assess the financial risk of the firm.
- Total leverage is the combination of operating and financial leverages. It examines the impact of change in the output upon the EPS of the company. Total leverage measures the total risk of the company as it includes measures of both operating risk and financial risk.

Chapter IX

Financial Forecasting

After reading this chapter, you will be conversant with:

- Need for Forecasting
- Pro forma Financial Statements
- Other Pro forma Statements

NEED FOR FORECASTING

Financial forecasting is a planning process with which the company's management positions the firm's future activities relative to the expected economic, technical, competitive and social environment. Business plans normally show strategies and actions for achieving desired short-term, intermediate, and long-term results. These are quantified in financial terms, in the form of projected financial statements (pro forma statements) and a variety of operational budgets.

There are three main techniques of financial projections. They are pro forma financial statements, cash budgets, and operating budgets. Pro forma statements are projected financial statements embodying a set of assumptions about a company's future performance and funding requirements. Cash budgets are detailed projections of the specific incidence of cash moving in and out of the business. Operating budgets are detailed projections of departmental revenue and/or expense patterns, and they are subsidiary to both pro forma statements and cash flow statements.

By developing pro forma statements, a comprehensive look at the likely future financial performance of a company can be obtained. These statements comprising of P&L statement and a balance sheet are extended into the future. The pro forma operating statement (P & L) represents an "operational plan" for the business as a whole, while the pro forma balance sheet reflects the anticipated cumulative impact of assumed future decisions on the financial condition of the business at a selected point of time. Both statements are prepared by taking the most readily available estimates of future activity and projecting, account by account, the assumed results and conditions. A third statement, a pro forma funds flow statement, adds further insight by displaying the various funds movements expected during the forecast period.

PRO FORMA FINANCIAL STATEMENT

The preparation of pro forma statements is explained with an Illustration of an hypothetical manufacturing company called Genius Corporation. The company sells two kinds of winter care products. These have a seasonal pattern with a low point of sale during May. The most recent results are available for the first quarter of the year 1. These statements give the initial set of data to project the future statements. The pro forma projection is to be made for the second quarter of the year 1, and the objective is to determine both the level of profit and the amount of additional funds required at the end of the second quarter.

Pro forma Income Statement

The operating statement is usually prepared first because the amount of after-tax profit must be reflected in the balance sheet as a change in retained earnings. The starting point in the preparation of pro forma operating statement, as shown on the first line of the Table 9.1 is a projection of the unit and rupee volume of sales. These can be estimated in a variety of ways like trend-line projection to detailed departmental sales forecasts by individual products.

Table 9.1

	Actual quarter ended March 31, Year 1	Pro forma Quarter ended June 30, Year 1	Assumptions
Units sold	14,000	9,800	Second quarter has seasonally low sales; past data show 30% decline from first quarter.
Net sales	1,40,000	98,000	No change in product mix and price.
	100.0%	100.0%	

Cost of goods sold Labor	22,960	16,366	20% of cost of goods sold as before.
Materials	25,256	18,002.6	22% of cost of goods sold as before.
Distribution	4,592	3,273.2	4% of cost of goods sold as before.
Overhead	61,992	44,188.2	54% of cost of goods sold as before.
Total	1,14,800	81,830	Increase by 1.5 percentage point simulates operating inefficiencies.
Ratio of cost of goods sold to sales	82.0%	83.5%	
Gross profit	25,200	16,170	
Gross profit margin	18.0%	16.5%	
Expenses: Selling expenses	8,250	7,500	Assuming a drop of Rs.750 due to lower activity
Gen & Admn.	4,450	3,600	Assuming a drop of Rs.850
Total	12,700	11,100	
Operating profit	12,500	5,070	
Interest	2,500	2,000	Based on outstanding debt
Depreciation	2,000	2,000	
PBT	7,000	1,070	
Tax @30%	2,100	321	
Net income	4,900	749	
Dividends	900	-0-	No payment of dividends
Retained earnings	4,000	749	Carried to balance sheet
Cash flow after dividends	6,000	2,749	Retained earnings + depreciation

In table 9.1, the actual operating statement for the first quarter ended March 31, is shown as a base for the analysis. Company statistics from past years show that during the second quarter a decrease of 29 to 31 percent from first quarter is normal. By taking the mid-point of 30 percent as mid-point the unit sales figure is obtained by decreasing the first quarter unit sales by 30 percent. After calculating a 30 percent decrease in unit volume further assumption is that both prices and product mix will remain unchanged. The assumption can be relaxed to have more insights or to test the impact of "what if so and so is changed by some percentage" type of questions.

Next is the estimation of cost of goods sold. For this, **percent of sales method** is used. An assumption is made that the future relationship between various elements of costs to sales will be similar to their historical relationship. The actual first-quarter operating statement provides details on the main components (labor, materials, overheads and distribution) in cost of goods sold. As the second quarter is the company's seasonal low point, it is assumed that some inefficiencies are likely to raise the overall cost of goods sold as operations slowdown. Cost of goods sold and gross margin can be calculated directly without the detailed cost breakdown. Selling expense is shown as Rs.8,250. Given that the second quarter has lower sales activity, a small decrease of Rs.750 can be assumed. A reduction fully proportional to the 20 percent drop in volume would not be possible as some of the expenses are fixed in nature. Similar is the case with the general and administrative expenses. This method of estimating the value of various items on the basis of expected developments in the future period is called the **budgeted expense method**.

As a result of the assumptions, the second quarter operating profit falls by over Rs.5,000 and the profit after-tax drops to less than one by five times its former level. This is mostly due to the 30 percent drop in sales volume and the associated profit contribution loss. Interest is charged according to the provisions of the outstanding debt, and this information can be obtained from the company's annual reports. The operating statement will be completed after we calculate the tax rates (assumed here at the rate of 30%). It can be observed that there is a significant decrease in the amount of net profits because of slowdown in operations. One more assumption needs to be made about the dividends to arrive at the retained earnings for the period, to be reflected in the pro forma balance sheet. In Genius Corp's case, it is assumed that no dividends will be declared because of low earnings.

Table 9.2

Pro forma Balance Sheet

	Actual March 31	Pro forma June 30	Change	Assumptions
LIABILITIES				
A. Share Capital	6,500	7,000	+500	Sale of stock under option
B. Reserves and Surplus Total (C + D)	4,500	5,250	+750	
C. Reserves	500	500	-0-	
D. P&L balance carried forward	4,000	4,750	+750	From P&L
E. Total Shareholders Funds (A + B)	11,000	12,250	+1,250	
F. Total Debt	7,500	7,500	-0-	
G. Total Liabilities (E + F)	18,500	19,750	+1,250	
ASSETS				
H. Gross Block [I + J]	24,000	23,000	–1,000	
I. Land	3,000	3,000	-0-	No change
J. Plant & Machinery	21,000	20,000	–1,000	Sale
K. Less: Accum. Depreciation	10,000	9,500	–500	
L. Net Block (H – K)	11,000	10,500	–500	
M. Current Assets, Loans and Advances (N + O)	14,500	16,000	+1,500	Accumulated
N. Inventories	10,500	12,500	+2,000	
O. Cash	4,000	3,500	–500	Cash set at estimated min. balance
Less: Current Liab. & Prov.				
P. Current Liabilities	5,000	4,000	–1,000	
Q. Provisions	2,000	2,000	-0-	
R. Net Current Assets (M – P – Q)	7,500	10,000	+2,500	
S. Total Assets (L + R)	18,500	20,500	+2,000	
Additional funds required (Total assets – Total liabilities)			+750	

Preparation of pro forma balance sheet is illustrated in the Table 9.2. Again specific assumptions have to be made about each item in the statement, working from the actual balance sheet and additional information we can obtain from the management. All the assumptions made are given in the table. The first account (share capital) is expected to increase by 500 as stock options are exercised. The retained earnings will increase by the net income of 750 as calculated in the pro forma income statement. Totally the amount of shareholder funds has increased by 1250. Long-term debt is assumed to remain unchanged.

On the assets side, first fixed assets are considered. In the present case, two types of fixed assets are taken. They are land, plant and machinery. Land remains unchanged and there is a reduction of Rs.1,000 in the plant and machinery account because of sale of machines. Next is net current assets. Net current assets is

obtained by deducting total current liabilities from total current assets. It is assumed that the demand for the products is going to increase from third quarter onwards. So, to meet the excess demand in the next quarter, products are already manufactured and kept in the inventory, though the sales in the present quarter are reduced. Regarding cash, the assumption is that three months hence the company would need to keep only the minimum working balance in its bank accounts. An amount of Rs.500 was the minimum balance it has kept over the periods. The assumption regarding current liabilities is that most of them are accounts payable and are assumed to decline in response to lower activity in the second quarter.

Finally, when the results are added up, there would be a difference between assets and liabilities amounts. So, assets and liabilities are made equal with a balancing figure, which represents either funds needed or the excess funds of the company on the pro forma balance sheet date. In the case of Genius Corp., the amount came out to as Rs.750. This figure is called plug figure and serves as a quick estimate of what amount of additional funds the company requires or the additional funds at the company's disposal.

OTHER PRO FORMA STATEMENTS

Cash Budget

Cash budgets (or cash flow estimates), are very specific planning tools that are prepared every month or even every week. They give the specific details about the incidence of cash receipts and cash payments. The financial manager who uses the cash budget after observing the changing levels of cash flows, decides the minimum amount of cash that should be kept to allow timely payments of obligations. Cash budgets on the whole, show the cash needs or excesses. The level at the end of the period will match if the cash budget was prepared using the same assumptions employed in generating the pro forma statements.

Operating Budget

The pro forma statements and cash budget provide an overall view of the company's future performance. In big organizations, normally specific operating budgets are prepared for different divisions (sales, production etc.,) in the organizational hierarchy. These form a backdrop for the preparation of pro forma statements and cash flow projections when a higher degree of detail and accuracy is required. There are many types of profit and expense budgets like sales budget which give the details of profit contribution and factory budget which provide only costs or expenses. For the present discussion, the sales budget is illustrated.

Sales Budget

Sales forecast provides the basis around which the firm's planning process is centered. Important areas of decision-making such as production and inventory scheduling, investment in machinery and other fixed assets, manpower requirements, raw material purchases, cash flow requirements are all dependent on the sales forecast. It, therefore, follows that any significant error in the forecast will have far-reaching and serious consequences. A sales forecast for the coming year would reflect:

Any past trend in sales that is expected to be continued in the coming year.

The influence of any events which might naturally effect that trend.

Sales forecasting is a complex subject which uses a variety of concepts and techniques. These can be broadly classified as being either subjective or objective.

SUBJECTIVE METHODS

The word "subjective" is used here, because these methods use the judgments or opinions of knowledgeable individuals within the company, ranging from sales representatives to executives.

Let us take a very brief look at some of the subjective measures commonly applied.

JURY OF EXECUTIVE OPINION

In this method, each of a member of executives makes an independent forecast of sales for the next period, usually a year, based on factual data at their disposal and using their mature judgmental abilities. Once these independent forecasts are made, the chief executive has to reconcile the differences after a joint discussion with all the executives. While the jury method is simple and represents a number of viewpoints, its chief disadvantage is that it is based on opinions.

SALES FORCE ESTIMATES

For short-term forecasts, it is likely that sales representatives can do a better job than can be done using more sophisticated objective methods. This is because they have the direct "feel" about the market. Sales representatives' knowledge of the probable demand of major accounts for the product (especially industrial products) over the coming months is about the only reliable basis on which a firm can adjust its plans to the dynamics of the market plan. The major disadvantage of using this method is that sales representatives may set targets which are too easily attainable so as to reduce their workload.

OBJECTIVE METHODS

These are statistical methods which range in sophistication from relatively simple trend extrapolations to the use of complicated mathematical models. More and more companies are relying on computers to predict causal relationships.

TREND ANALYSIS VIA EXTRAPOLATION

A simple objective method of forecasting is the extrapolation of past sales trends. The major assumption is that sales for the coming period will change to the same degree as sales changed from the prior period to the current period. Thus, in this method, the past trend in sales is identified and this trend is projected into the future. While doing trend analysis, the analyst must keep in mind that the time series of a product's past sales is made up of four major factors:

- **The first factor, long-term trend,** is the result of basic developments in population, capital formation and technology. This is found by fitting a straight or curved line through past sales.
- **The second factor, cycle,** captures the wave-like movement of sales as a result of swings in general economic activity, which tends to be somewhat periodic. This cyclical component can be useful in intermediate range forecasting.
- **The third factor, seasonal variations,** refers to a consistent pattern of sales movements within the year which may be related to climatic factors, holidays, customs, etc. The seasonal pattern provides a basis for forecasting short range sales.
- **The fourth factor, erratic events,** includes strikes, riots, earthquakes and other unpredictable disturbances. These erratic factors should be removed from past data to see the more normal behavior of sales. While analyzing, the original sales series should be broken up into these components and recombined to produce the sales forecast. Let us take a look at how this is done.

An automobile company sold 60,000 cars during the last year ended 31st December. The company would like to predict sales for the current year ending 31st December. The long-term trend of sales shows a 5 percent growth rate per year. This factor, taken by itself, suggests that sales for the next year will amount to 63,000 cars. However, economists predict a recession next year that will probably result in the company achieving only 80 percent of the expected trend – adjusted sales. This means that sales next year are more likely to be 50,400 cars. Assuming that sales follow a uniform pattern throughout the year (i.e., there is not much seasonal fluctuations), monthly sales would amount to 4,200 cars. However, December seems to be an above-average month for car sales with a seasonal index standing at 1.20. Therefore, in comparison with the other months, December sales will be 5,040 cars. Since erratic events cannot be reasonably predicted anyway, the best estimate of car sales for next December is 5,040 cars.

Regression Analysis

Regression analysis can be used in sales forecasting to measure the relationship between a company's sales (dependent variable) and other independent variables like income, population, etc. For Illustration, automobile manufacturers may find that their sales are related to personal income – when income goes up, sales go up and vice-versa. To use this relationship in forecasting car sales, the company must determine the degree of relationship. In other words, this leads to the question, if income rises, by say, 10 percent, will car sales rise by 10 percent, 30 percent, 15 percent, or what? Using regression analysis, sales (Q), a dependent variable is expressed as a function of a number of independent variables, X_1, X_2, ...X_n, i.e.,

$$Q = f(X_1, X_2, ...X_n)$$

Various equation forms can be statistically fitted to the data in the search for the best predicting factors and equation. The coefficients of the equation are estimated according to the criterion of least squares. According to this criterion, the best equation is one that minimizes the sum of the squared deviations of the actual from the predicted observations. The equation can be derived using standard formulae.

Regression analysis has the advantage of being more objective than the methods discussed so far.

Next, the price levels for each product are estimated by taking three factors into consideration. They are industry pricing practices, competitive environment, cost effectiveness of company's manufacturing operations. Once price is projected, sales revenue can be calculated. Next cost of goods sold is estimated. After projecting selling and administrative expenses, gross profit margin is obtained. This way, the sales budget for different short-term periods is estimated.

Growth and External Financing Requirement

Financial plans force managers to be consistent in their goals for growth, investments, and financing. In the long-term planning the relationship between the firm's growth objectives and its external financing requirements are very useful. For Illustration, ABC company started with Rs.10 lakh of fixed assets and working capital and forecasts a growth of 10 percent. This higher sales volume required a 10 percent addition to its assets. Thus

New investment	=	Growth rate x Initial assets
	=	0.1 x 10,00,000
	=	Rs.1,00,000

Part of the funds to pay for new assets is provided by retained earnings. The remainder must come from external financing.

The external financing requirement can be found out with the help of the following equation:

$$EFR = \frac{A}{S}(\Delta S) - \frac{L}{S}(\Delta S) - mS_1(1 - d)$$

Where

EFR	=	external financing requirement
A/S	=	current assets and fixed assets as a proportion of sales
Δ S	=	expected increase in sales
L/S	=	spontaneous liabilities as a proportion of sales
m	=	net profit margin
S_1	=	projected sales for next year
d	=	dividend pay-out ratio.

Changing the equation a bit, we get:

$$\frac{EFR}{\Delta S} = \frac{A}{S} - \frac{L}{S} - \frac{m(1+g)(1-d)}{g}$$

where g is the growth rate in sales.

Illustration 9.1

XYZ Company has the following ratios:

A/S = 0.8, ΔS = Rs.5 lakh, L/S = 0.3,

m = 0.05, S_1 = Rs.50 lakh, and d = 0.4.

EFR = (0.8) (5) – (0.3) (5) – (0.05) (50) (0.6)

= Rs.1 lakh.

This equation highlights that the amount of external financing depends on the firm's projected growth in sales. The faster the firm grows, the more it needs to invest and therefore the more it needs to raise new capital.

At low growth rates, the firm generates more funds than necessary for expansion. In this sense, its requirement for further external funds is negative. It may choose to use its surplus to pay-off some of its debt. When growth is zero, no funds are needed for expansion, so all the retained earnings are surplus funds with the firm.

As the firm's projected growth rate increases, more funds are needed to pay for the necessary investments. For high rates of growth the firm must issue new securities to pay for new investments.

A firm with a high volume of retained earnings relative to its assets can generate a higher growth rate without needing to raise more capital.

Without resorting to external financing, maximum sales growth rate (g) that can be financed is given by equating EFR to zero

$$\text{(i.e.)}\ 0 = \left(\frac{A}{S} - \frac{L}{S} - \frac{m(1+g)(1-d)}{g} \right) \text{x}\ \Delta S$$

Sustainable Growth Rate

A firm, though having a desire to grow, may not like to raise external equity due to various reasons like high cost of issue, large degree of underpricing required, or unacceptable dilution of control. In such a case, the company would like to know the rate of growth which it can achieve without resorting to issue of external equity. The following assumptions have to be made in order to find out this rate:

- The assets of the firm will increase proportionally to sales.
- Net profit margin is constant.
- Dividend pay-out ratio and debt-equity ratio will remain constant.
- External issue of equity will not be resorted to.

Now, let

A = E + D

i.e., Total Assets = Equity + Total Debt

E = equity employed by the firm

D = debt employed by the firm

D/E = debt-equity ratio

and the other symbols have the same meaning as stated earlier.

Using the above assumptions and symbols, we get:

Next period's income: $mS_1 = mS_0 (1 + g)$

Increase in retained earnings: $mS_0 (1 + g) (1 – d)$

Increase in borrowings: $mS_0 (1 + g) (1 – d) D/E$

Increase in assets: $\Delta A = Ag$

Since increase in assets is equal to increase in retained earnings plus increase in borrowings,

$Ag = mS_0 (1 + g) (1 – d) + mS_0 (1 + g) (1 – d) D/E$

Rearranging the equation, we get:

$$g = \frac{m(1-d)A/E}{A/S_0 - m(1-d)A/E}$$

Illustration 9.2

$m = 0.05$, $d = 0.4$, $A/E = 1.5$, $A/S_0 = 0.8$

The rate of growth sustainable with internal equity will be:

$$g = \frac{0.05(1-0.4)\,x\,1.5}{0.8 - 0.05(1-0.4)\,x\,1.5} = 5.96\%$$

Computerized Financial Planning Systems

From the 1980s, the use of planning models and computer-generated spreadsheets has grown enormously, as most of the available financial software packages are offering financial simulation and projection capabilities. Though these commercial packages differ in their specific orientation and degree of sophistication, at the conceptual level they help the analyst in projections. Computer speed and multiple tracking facilities have reduced much of the hardwork involved in tracing investment, operational, and financing assumptions through the financial framework of a business.

The main usefulness of computerized financial planning systems can be seen in expanded ability of financial analyst to explore the consequences of different assumptions, conditions and plans. In preparing various statements like pro forma statements, cash flow statements and budgets, different aspects like company's accounting procedures, depreciation schedules, tax calculations, debt service schedules, inventory policies have to be taken into consideration. When the company's systems are computerized, it becomes easy for the analyst to study various assumptions and their outcomes with the given set of accounting, tax and other policy constraints.

SUMMARY

- Financial forecasting is the process where a company's management positions the firm's future activities based upon the expected external environment – economic, technical, and social. The strategies and actions that a firm wants to pursue are quantified in financial terms in the form of projected financial statements and different types of operating budgets.
- The three main techniques of financial projections are pro forma financial statements, cash budgets and operating budges. Pro forma financial statements are projected future statements of a company based upon a set of assumptions about future performance relative to the market conditions. Cash budgets are specific planning tools prepared periodically (usually a month) that give the details of expected cash receipts and cash payments. By observing the changing level of cash flows, a finance manager can decide upon the minimum balance that should be kept for timely payment of obligations.
- While pro forma statements and cash budget give an overall picture of a company's future performance, operating budgets are prepared for specific divisions such as sales, production, etc., and provide a micro-level view of the company's future operations.
- Sales forecasting can be done using subjective and objective methods. Subjective methods include Jury of Executive Opinion and Sales Force Estimates while Trend Analysis via Extrapolation and Regression Analysis are the objective methods.

PAPER II

Chapter X

Sources of Long-Term Finance

After reading this chapter, you will be conversant with:

- Need for Long-Term Finance
- Types of Capital
- Types of Debentures
- Issue of Securities

NEED FOR LONG-TERM FIANANCE

Business firms need finance mainly for two purposes – to fund the long-term decisions and for meeting the working capital requirements. The long-term decisions of a firm involve setting up of the firm, expansion, diversification, modernization and other similar capital expenditure decisions. All these decisions involve huge investment, the benefits of which will be seen only in the long-term and these decisions are also irreversible in nature. By nature of these projects, long-term sources of funds become the best suited means of financing. One of the most important consideration for an investment and financing decision will be proper asset-liability management. Companies will have to face a severe asset-liability mismatch if the long-term requirements are funded by the short-term sources of funds. Such a mismatch will lead to an interest rate risk thereby enhancing the interest burden of the firm and a liquidity risk with the short-term funds being held up in long-term projects. Let us consider the costs and means of finance of a few projects.

a. Ponni Sugars & Chemicals Ltd. is setting up a new sugar mill in Orissa, the details of the cost of the project and the means of financing are given below.

	Particulars	Rs. in lakh
Cost of the Project		
1.	Land and Site Development	102
2.	Buildings	543
3.	Plant and Machinery	2,959
4.	Miscellaneous Fixed Assets	176
5.	Fees for Consultants	55
6.	Preliminary and Pre-operative Expenses	445
7.	Provision for Contingencies	210
8.	Margin Money for Working Capital	60
Total		4,550

	Particulars	Rs. in lakh
Means of Financing		
1.	Equity Capital:	
	– Promoters	208
	– Rights to Shareholders	605
2.	Partly Convertible Debentures:	
	– Rights Issue	605
	– Public Issue	1600
3.	Rupee Term Loan from Financial Institution	1,250
4.	Internal Accruals	282
Total		4,550

b. Bhilwara Spinners Ltd., a closely held company belonging to the Bhilwara Group, engaged in the manufacture of various types of yarns and sewing threads, has gone in for a modernization program, the cost and the means of finance for the same are given below.

Cost of the Project

Sl. No.	Particulars		Total Cost (Rs. in lakh)
A. **Capital Expenditure For Modernization Program**			
I.	Machinery Equipments		
	i. Cards	279.84	
	ii. Ring frames with 2 overhead cleaners	71.14	
	iii. TFO VL150		
	TFO VTS 09	155.67	

Sl. No.	Particulars		Total Cost (Rs. in lakh)
	iv. Uster	14.00	
	v. Ring Data System	9.51	
	vi. Draw Frame	14.89	
	vii. Condenser LVS	5.65	
	viii. Blender	5.15	
	ix. Accessories and other necessary machines	22.67	578.52
II.	Building		
	i. Construction of yarn godown	6.48	6.48
	Total (I) + (II)		585.00
B.	**Long-term working capital requirement**		708.00
C.	**Public issue expenses**		50.00
			1,343.0

Means of Finance

Particulars				Rs. in lakh
		Nominal Value	Share Premium	Total Amount
A.	**Equity Capital**			
a.	Promoters, directors, their friends and relatives	50.00	50.00	100.00
b.	Public issue	375.00	375.00	750.00
				850.00
B.	**Term Loan**			
	IFCI – Rupee term loan			
	– Under Equipment Finance Scheme	275.00		
	– Under Equipment Credit Scheme	178.00		453.00
C.	**Internal Accruals**			40.00
				1,343.00

c. Arvind Polycot Ltd. has started a project with the latest spinning & weaving machineries for the manufacture of 100% cotton high value fabrics to capture the international textile market in a big way. The cost and means of finance of the project which has been appraised by ICICI is as follows.

Cost of the Project

Particulars		Rs. in lakh
Land		75
Building		1,050
Plant and Machinery		
Imported	2,866	
Indigenous	1,612	
Erection, Installation	150	4,628
Miscellaneous Fixed Assets		1,068
Preliminary & Pre-operative Expenses		600
Contingencies		816
Working Capital Margin		426
	TOTAL	8,663

MEANS OF FINANCE		
(i) Issue of Debentures to Public		3,732
(ii) Issue of Debentures to Arvind Mills Ltd.		2,371
(iii) Issue of Debentures on Rights Basis		2,560
	TOTAL	8,663
OTHER REQUIREMENT OF FUNDS		
Other requirement of funds as appraised by ICICI in September, 1992 is as under:		
Long-Term Working Capital Requirements		870
	TOTAL	870
MEANS OF FINANCE		
(i) Issue of Debentures to Public		529
(ii) Cash Accruals		341
	TOTAL	870

In the above cases, the sources of long-term financing for firms are generally issue of securities, term loans, internal accruals, suppliers credit scheme and equipment financing. In addition to these, firms have the option of funding their projects by way of deferred credit, unsecured loans and deposits and venture capital financing. Some important and popular sources of long-term financing are discussed here.

TYPES OF CAPITAL

Firms can issue three types of capital – equity, preference and debenture capital. These three types of capital distinguish amongst themselves in the risk, return and ownership pattern.

Equity Capital

Equity Shareholders are the owners of the business. They enjoy the residual profits of the company after having paid the preference shareholders and other creditors of the company. Their liability is restricted to the amount of share capital they contributed to the company. Equity capital provides the issuing firm the advantage of not having any fixed obligation for dividend payment but offers permanent capital with limited liability for repayment. However, the cost of equity capital is higher than other capital. Firstly, since the equity dividends are not tax-deductible expenses and secondly, the high costs of issue. In addition to this since the equity shareholders enjoy voting rights, excess of equity capital in the firms' capital structure will lead to dilution of effective control.

Preference Capital

Preference shares have some attributes similar to equity shares and some to debentures. Like in the case of equity shareholders, there is no obligatory payment to the preference shareholders; and the preference dividend is not tax deductible (unlike in the case of the debenture holders, wherein interest payment is obligatory). However, similar to the debenture holders, the preference shareholders earn a fixed rate of return for their dividend payment. In addition to this, the preference shareholders have preference over equity shareholders to the post-tax earnings in the form of dividends; and assets in the event of liquidation.

Other features of the preference capital include the call feature, wherein the issuing company has the option to redeem the shares, (wholly or partly) prior to the maturity date and at a certain price. Prior to the Companies Act, 1956 companies could issue preference shares with voting rights. However, with the commencement of the Companies Act, 1956, the issue of preference shares with voting rights has been restricted only in the following cases:

i. There are arrears in dividends for two or more years in case of cumulative preference shares;

ii. Preference dividend is due for a period of two or more consecutive preceding years, or

iii. In the preceding six years including the immediately preceding financial year, if the company has not paid the preference dividend for a period of three or more years.

Types of Preference Capital: Preference shares can be of two types in three categories.

i. Cumulative or Non-cumulative preference shares

ii. Redeemable or Perpetual preference shares.

iii. Convertible or non-convertible preference shares.

For cumulative preference shares, the dividends will be paid on a cumulative basis, in case they remain unpaid in any financial year due to insufficient profits. The company will have to pay up all the arrears of preference dividends before declaring any equity dividends. While on the other hand, the non-cumulative shares do not enjoy such right to dividend payment on cumulative basis.

Redeemable preference shares will be redeemed after a given maturity period while the perpetual preference share capital will remain with the company forever.

Debenture Capital

A debenture is a marketable legal contract whereby the company promises to pay its owner, a specified rate of interest for a defined period of time and to repay the principal at the specific date of maturity. Debentures are usually secured by a charge on the immovable properties of the company.

The interest of the debenture holders is usually represented by a trustee and this trustee (which is typically a bank or an insurance company or a firm of attorneys) is responsible for ensuring that the borrowing company fulfills the contractual obligations embodied in the contract. If the company issues debentures with a maturity period of more than 18 months, then it has to create a Debenture Redemption Reserve (DRR), which should be at least half of the issue amount before the redemption commences. The company can also attach call and put options. With the call option the company can redeem the debentures at a certain price before the maturity date and similarly the put option allows the debenture holder to surrender the debentures at a certain price before the maturity period.

Types of Debentures

Debentures can be classified based on the conversion and security. A few types of debentures are discussed below:

NON-CONVERTIBLE DEBENTURES (NCDS)

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

- ICICI offered for public subscription for cash at par, 20,00,000 16% unsecured redeemable Bonds (Debentures) of Rs.1,000 each. These bonds are fully non-convertible and so here, the investor is just not given the option of converting it into equity. Interest on the ICICI bonds will be paid half-yearly on June 30 and December 31 each year. The Company proposes to redeem these bonds at par on the expiry of 5 years from the date of allotment i.e., the maturity period is 5 years. But ICICI has also allowed its 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 after a specified period of time at one stroke or in installments. These debentures may or may not carry interest till the date of conversion. In the case of a fully established company with an established reputation and good, stable market price, FCD's are very attractive to the investors as their bonds are getting automatically converted to shares which may at the time of conversion be quoted much higher in the market compared to what the debenture holders paid at the time of FCD issue.

- Recently 3 reputed companies, Apple Industries Limited, Arvind Polycot Limited and Jindal Iron and Steel Company Limited have come out with the issue of Zero percent FCDs for cash at par. Let us take a look at the Jindal issue.

  The total issue was for 3,01,72,080 secured Zero Interest Fully Convertible Debentures. Of these, 1,29,30,000 FCDs of Rs.60 each were offered to the existing shareholders of the company on Rights basis in the ratio of one FCD for every one fully paid equity share held as on 30.03.93. The balance of 1,72,42,080 secured zero-interest FCDs were offered to the public at par value of Rs.100 each.

  The terms of conversion were as follows: Each fully paid FCD will be automatically and compulsorily converted into one equity share of Rs.10 each at a premium of Rs.90 per share. Credited as fully paid-up, conversion into equity shares will be done at the end of 12 months from the date of allotment.

PARTLY CONVERTIBLE DEBENTURES (PCDS)

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

- Let us look at the illustration given earlier on Ponni Sugars and Chemicals in greater detail. The company is offering PCDs worth Rs.2,205 lakh of which Rs.605 lakh is being offered to the existing shareholders. The issue is for 14,70,000 16% Secured Redeemable PCDs of Rs.150 each. Out of this, 4,06,630 PCDs is by way of Rights Issue, in the ratio of one PCD for every ten equity shares held. The balance of 10,63,370 PCDs are offered to the public. Of the total face value of Rs.150, the convertible portion will have a face value of Rs.60 and the non-convertible portion, a face value of Rs.90. A 'tradeable warrant' will be issued in the ratio of one warrant for every 5 fully paid PCDs. Each such warrant will entitle the holder to subscribe to one equity share at a premium which will not exceed Rs.20 per share within a period of 3 years from the date of allotment of the PCDs. This is not included in the conversion at the rate of 1:10. The tradeable warrants will also be listed in stock exchanges to ensure liquidity. Interest at 16% on the paid-up value of the PCD allotted shall accrue from the date of allotment, but interest on the convertible portion of the PCD will be paid only up to the date immediately preceding the date of conversion. The non-convertible portion of the PCD will be redeemed in 3 stages at the end of the 6th, 7th and 8th year from the allotment of the PCD.

SECURED PREMIUM NOTES (SPNs)

This is a kind of NCD with an attached warrant that has recently started appearing in the Indian Capital Market. This was first introduced by TISCO which issued SPNs aggregating Rs.346.50 crore to existing shareholders on a rights basis. Each SPN is of Rs.300 face value. No interest will accrue on the instrument during the first 3 years after allotment. Subsequently the SPN will be repaid in 4 equal

installments of Rs.75 each from the end of the fourth year together with an equal amount of Rs.75 with each installment. This additional Rs.75 can be considered either as interest (regular income) or premium on redemption (capital gain) based on the tax planning of the investor.

The warrant attached to the SPN gives the holder the right to apply for and get allotment of one equity share for Rs.100 per share through cash payment. This right has to be exercised between one and one-and-half year after allotment, by which time the SPN will be fully paid-up.

Box 10.1: New Financial Instruments

- **Non-voting Shares:** Useful for companies seeking to bolster net worth without losing management control. Similar in every respect to equity, the sole exception being the absence of voting rights.
- **Detachable Equity Warrants:** Issuable with Non-convertible Debentures (NCDs) or other debt or equity instruments. Ideal for firms with growth prospects, which would prefer equity coupons to convertible debentures (CDs).
- **Participating Debentures:** These are unsecured corporate debt securities which participate in the profits of a company. Potential issuers will be existing dividend-paying companies. Could appeal to investors willing to accept risk for higher returns.
- **Participating Preference Shares:** Quasi-equity instrument to bolster net worth without loss of management control. Pay-outs linked to equity dividend, and also eligible for bonus. Will appeal to investors with an appetite for low risk.
- **Convertible Debentures with Options:** A derivative of the convertible debentures with an embedded option, providing flexibility to the issuer as well as the investor to exit from the terms of the issue. The coupon rate is specified at the time of the issue.
- **Third Party Convertible Debentures:** Debt with a warrant allowing the investor to subscribe to the equity of a third firm at a preferential price vis-á-vis the market price. Interest rate here is lower than pure debt on account of the conversion option.
- **Mortgage-backed Securities:** A synthetic 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. Serves a similar purpose as that of convertible debt, but risks to investors are lower.
- **Debt-equity Swaps:** An offer from an issuer of debt to swap it for common stock (equity). The risks: it may dilute earnings per share in the case of the issuer; the expected capital appreciation may not materialize in the case of the investor.
- **Zero-coupon Convertible Note:** A zero-coupon convertible note (ZCCN) converts into common stock. If investors choose to convert, they forgo all accrued and unpaid interest. The risk: ZCCN prices are sensitive to interest rates.

Issue of Securities

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

- Public Issue
- Rights Issue

- Private Placement
- BODs
- Euro-Issues.

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

PUBLIC ISSUE

Companies issue securities to the public in the primary market and get them listed on the stock exchanges. These securities are then traded in the secondary market. The major activities involved in making a public issue of securities are as follows:

Appointment of the Lead Manager

Before making a public issue of securities the firm should appoint a SEBI registered Category-I Merchant Banker to manage the issue. The lead manager will be responsible for all the pre and the post-issue activities, liaison with the other intermediaries, statutory bodies like SEBI, Stock Exchanges and the Registrar of Companies (ROC) and finally ensures that the securities are listed on the stock exchanges.

Preparation of the Prospectus

The Lead Manager is responsible for the preparation of the prospectus. The prospectus is a document that disseminates all the information about the company, the promoters, the objectives of the issue and has the contents as specified by the Company Law. The final prospectus has to be forwarded to SEBI and the listing Stock Exchange.

Appointment of Intermediaries

The other intermediaries who are involved in the public issue of securities are underwriters, registrars, bankers to the issue, brokers and advertising agencies. Apart from these it also involves promotion of the issue, printing and despatch of prospectus and application forms, obtaining statutory clearances, filing the initial listing application, final allotment and refund activities. The cost of a public issue ranges between 12-15% of the issue size and can go up to 20% in bad market conditions.

RIGHTS ISSUES

Under 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 on a pro rata basis. The rights offer should be kept open for a period of 60 days and should be announced within one month of the closure of the books. The shareholders can also renounce their rights in favor of any other person at market determined rate. The cost of floating of rights issue will be comparatively less than the public issue, since these securities are issued to the existing shareholders, thereby eliminating the marketing costs and other relevant public issue expenses. The rights issue will also be priced lower than the public issue since it will be offered to the existing shareholders.

Ex-rights Value of a Share

The value of a share, after the rights issue, is

$$\frac{NP_0 + S}{N + 1}$$

Where

N = number of existing shares required for a rights share

P_0 = cum-rights price per share

S = subscription price at which rights shares are issued.

If a company issues one share for every 3 shares held at a price of Rs.25 per share, and the existing price is Rs.30 per share, the ex-rights price of the share would be

$$= \frac{3 \times 30 + 25}{3 + 1}$$

= Rs.28.75 per share.

Value of a right

The theoretical value of a right is

$$\frac{P_0 - S}{N + 1}$$

In the above example, it would be

= (30 – 25) / 4 = Rs.1.25

PRIVATE PLACEMENT

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

- Easy access to any company
- Fewer procedural formalities
- Lower issue cost
- Access to funds is faster.

BOUGHT-OUT DEALS

Buy-out is a process whereby an investor or a group of investors buy-out a significant portion of the equity of an unlisted company with a view to sell the equity to public within an agreed time frame. The company places the equity shares, to be offered to the public, with a sponsor. At the right time, the shares will be off loaded to the public through the OTCEI route or by way of a public issue. The bought-out deal route is relatively inexpensive, funds accrue without much delay (in a public issue funds reach the company only after a period of 2-3 months from the date of closure of the subscription list). In addition to this, it affords greater flexibility in terms of the issue and matters relating to off-loading with proper negotiations with the sponsor or the Merchant Banker involved. 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 the BOD method.
- The procedural complexities are reduced considerably and the funds reach the firm upfront. Added to this there is a cut in the issue costs.
- An advantage accruing the investor is that the issue price usually reflects the company's intrinsic value.

EURO-ISSUES

The Government has allowed Indian companies to float their stocks in foreign capital markets. The Indian corporates, which face high rates of interest in the domestic markets are now free to tap the global capital markets for meeting resource requirements at less costs and administrative problems. The instruments which the company can issue are Global Depository Receipts (GDRs), Euro-Convertible Bonds (ECBs), Foreign Currency Convertible Bonds (FCCBs). These instruments are issued abroad and listed and traded on a foreign stock exchange. Once they are converted into equity, the underlying shares are listed and traded on the domestic exchange.

Term Loans

Term Loans constitute one of the major sources of debt finance for a long-term project. Term loans are generally repayable in more than one year but less than 10 years. These term loans are offered by the All India Financial Institutions viz., IDBI, ICICI etc. and by the State Level Financial Institutions. The salient features of the term loans are the interest rates, security offered and the restrictive covenants.

The interest rate on the term loans will be fixed after the financial institution appraises the project and assesses the credit risk. Generally there will be a floor rate fixed for different types of industries. The interest and the principal installment payment are obligatory for the company and any defaults, in this regard will attract a penalty. The company will generally be given 1-2 years of moratorium period, and they will be asked to repay the principal in equal semi-annual installments.

Term Loans, which can be either in rupee or foreign currency, are generally secured through a first mortgage or by way of depositing title deeds of immovable properties or hypothecation of movable properties. In addition to the security, financial institutions also place restrictive covenants while granting the term loan. These depend mostly on the nature of the project and can include placing the nominees of the financial institution on the company's board, refrain the company from undertaking any new project without their prior approval, disallow any further charges on the assets, maintain the debt-equity ratio to a certain level, etc.

The major advantage of this source of finance is its post-tax cost, which is lower than the equity/preference capital and there will be no dilution of control. However, the interest and principal payments are obligatory and threaten the solvency of the firm. The restrictive covenants may, to a certain extent, hinder the company's future plans.

Internal Accruals

Financing through internal accruals can be done through the depreciation charges and the retained earnings. While depreciation amount will be used for replacing an old machinery etc., retained earnings on the other hand can be utilized for funding other long-term objectives of the firms. The major advantages the company gets from using this as a source of long-term finance are its easy availability, elimination of issue expenses and the problem of dilution of control. However, the disadvantage is that there will be limited funds from this source. In addition to this ploughing back of retained earnings implies foregoing of dividend receipts by the investors which may actually lead to higher opportunity costs for the firm.

Deferred Credit

The deferred credit facility is offered by the supplier of machinery, whereby the buyer can pay the purchase price in installments spread over a period of time. The interest and the repayment period are negotiated between the supplier and the buyer and there are no uniform norms. 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 schemes.

Leasing and Hire Purchase

The other sources of finance for companies are the leasing and hire purchase of assets. These two types of financing options, which are supplementary to the actual long-term sources, are offered by financial institutions, Non-Banking Finance Companies, Banks and manufacturers of equipment/assets. Leasing is a contractual agreement between the lessor and the lessee, wherein companies (lessee) can enter into a lease deal with the manufacturer of the equipment (lessor) or through some other intermediary. This deal will give the company the right to use the asset till the maturity of the lease deal and can later return the asset or buy it from the manufacturer. During the lease period the company will have to pay lease rentals, which will generally be at

negotiated rate and payable every month. 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 the mushrooming of non-banking finance companies offering the leasing and hire purchase of equipments, many companies are opting for this route to finance their assets. The cost of such financing generally lies between 20-25%.

Government Subsidies

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

Category A Districts	25 percent of the fixed capital investment subject to a maximum of Rs.25 lakh
Category B Districts	15 percent of the fixed capital investment subject to a maximum of Rs.15 lakh
Category C Districts	10 percent of the fixed capital investment subject to a maximum of Rs.10 lakh

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

- Satavahana Ispat Limited has been set up with the capacity to manufacture 1,20,000 tonnes of pig iron. The cost of project has been appraised by IDBI at Rs.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 Rs.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 'C' Category backward area.

Sales Tax Deferments and Exemptions

To attract industries, the state provides incentives, *inter alia*, 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.

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 which are 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.

Thus, with a definite increase in the variety of sources for long-term funds rising, an efficient finance manager will be the one who devises the optimum financing mix. The funding process should be a trade-off between the cost of funding, the risk involved and the returns expected, so that a reasonable spread is maintained for the firm.

Lupin Chemicals Ltd. have stated in their prospectus 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.

SUMMARY

- Long-term finance is absolutely essential for any operating concern. Any company needs to have a lot of money for investing in long-term assets such as land and buildings, plant and machinery, technical know-how and working capital margin and hence it needs long-term sources of funds to finance these investments as usage of short-term funds will only result in asset-liability mismatch and make the firm illiquid.
- There are three main sources of long-term funds – equity shares, preference shares and debentures. Equity shareholders are the owners of the company and enjoy residual profits after having paid all the commitments including preference share dividend. Companies have no fixed obligation to pay dividends and hence equity offers perpetual capital with limited liability for repayment. However, since the equity shareholders assume a lot more risk than others, cost of equity is higher than the cost of other sources of finance. In addition, since equity shareholders enjoy voting rights, too much of equity capital can dilute the control of the management.
- Preference shares are similar to equity in that there is no obligatory payment and the dividends are not tax deductible. However, preference shareholders earn a fixed rate of return for their investments and have a preference over equity shareholders to post-tax earnings in the form of dividends and assets in case of liquidation. Preference shares can be classified into three types: cumulative and non-cumulative, redeemable and perpetual and convertible and non-convertible.
- Debentures are marketable contracts where-in the company promises to pay the holder a specified rate of interest for a certain period and repay the principal on maturity. These instruments are generally secured by a charge on immovable properties of the companies. Interest paid on debentures is tax deductible and debentureholders have the first right to assets in case of liquidation. Debentures can be classified into non-convertible, partly convertible and fully convertible debentures.
- A company can raise money using any of these instruments by going to the capital market. There are many ways of doing it. A company can go for a public issue, a rights issue, private placement, buyout deals or euro-issues for raising finances.
- With a definite increase in the variety of sources for long-term funds raising, an efficient finance manager will be the one who devises the optimum financing mix. The funding process should be a trade-off between the cost of funding, the risk involved and the returns expected, so that a reasonable spread is maintained for the firm.

Chapter XI

Cost of Capital and Capital Structure Theories

After reading this chapter, you will be conversant with:

- The Meaning of Cost of Capital
- Costs of Different Sources of Finance
- Concept of Weighted Average Cost of Capital
- Weighted Marginal Cost of Capital Schedule
- Meaning of Capital Structure
- Factors affecting the Capital Structure
- Theories of Capital Structure

SECTION 1: THE MEANING OF COST OF CAPITAL

Introduction

Now that we are familiar with the different sources of long-term finance, let us find out what it costs the company to raise these various types of finance. The cost of capital to a company is the minimum rate of return that it must earn on its investments in order to satisfy the various categories of investors who have made investments in the form of shares, debentures or term loans. Unless the company earns this minimum rate, the investors will be tempted to pull out of the company, leave alone participate in any further capital investment in that company. For example, equity investors expect a minimum return as dividend on their perception of the risk undertaken based on the company's past perfosrmance, or on the returns they are getting from shares they have of other companies.

The weighted arithmetic average of the cost of different financial resources that a company uses is termed as its cost of capital. Let us look at a simple example. A company has a total capital base of Rs.500 lakh in the ratio of 1:1 of debt-equity[1] i.e., divided equally between debt and equity; Rs.250 lakh of debt and Rs.250 lakh of equity. If the post-tax costs of debt and equity are 7% and 18% respectively, the cost of capital to the company will be equal to the weighted average cost i.e.,

$$\frac{250}{500} \text{ x } 7\% + \frac{250}{500} \text{ x } 18\% = 12.5\%.$$

Assumptions

Given this definition of cost of capital, it must be noted that the use of this measure for appraising new investments will depend upon two important assumptions: (a) the risk characterizing the new project under consideration is not significantly different from the risk characterizing the existing investments of the firm, and (b) the firm will continue to pursue the same financing policies. Put differently, there will be no deviation from the debt-equity mix presently adopted by the firm.

For calculating the cost of capital of the firm, we have to first define the cost of various sources of finance[2] used by it. The sources of finance that are typically tapped by a firm are (a) debentures (b) term loans (c) preference capital (d) equity capital, and (e) retained earnings. The mechanics involved in computing the costs of these sources of finance are discussed in the following section.

COSTS OF DIFFERENT SOURCES OF FINANCE

Cost of Debentures

The cost of a debenture is defined as the discount rate which equates the net proceeds from issue of debentures to the expected cash outflows in the form of interest and principal repayments, i.e.

$$P = \sum_{t=1}^{n} \frac{I(1-t)}{(1+k_d)^t} + \frac{F}{(1+k_d)^n} \qquad \text{.....(1)}$$

where,

k_d = post-tax cost of debenture capital

I = annual interest payment per debenture capital

t = corporate tax rate

1. This text is called the Debt-Equity Ratio which will be covered in detail later in this chapter.
2. The cost of a source of finance is defined as the rate of discount which equates the present value of the expected payments to that source of finance with the net proceeds received from that source of finance. The formulae discussed in this section for obtaining the costs of the different sources have been derived using this definition.

F = redemption price per debenture
P = net amount realized per debenture and
n = maturity period.

The interest payment (I) is multiplied by the factor (1 – t) because interest on debt is a tax-deductible expense and only post-tax costs are considered.

An approximation formula as given below can also be used.

$$k_d = \frac{I(1-t) + \frac{F-P}{n}}{\frac{F+P}{2}} \quad \text{.....(2)}$$

Note: When the difference between the redemption price and the net amount realized can be written off evenly over the life of the debentures and the amount so written-off is allowed as a tax-deductible expense, the above two equations can be changed as follows:

Equation (1) becomes

$$P = \sum_{t=1}^{n} \frac{I(1-t) - \frac{(F-P)t}{n}}{(1+k_d)^t} + \frac{F}{(1+k_d)^n}$$

Equation (2) becomes

$$k_d = \frac{I(1-t) + \left(\frac{F-P}{n}\right)(1-t)}{\frac{F+P}{2}}$$

The following Illustration illustrates the application of this formula.

Illustration 11.1

Ajax Limited has recently made an issue of non-convertible debentures for Rs.400 lakh. The terms of the issue are as follows: each debenture has a face value of Rs.100 and carries a rate of interest of 14 percent. The interest is payable annually and the debenture is redeemable at a premium of 5 percent after 10 years.

If Ajax Limited realizes Rs.97 per debenture and the corporate tax rate is 50 percent, what is the cost of the debenture to the company?

Solution

Given I = Rs.14, t = 0.5, P = Rs.97, and n = 10 years, F = Rs.105, the cost per debenture (k_d) will be:

$$k_d = \frac{14(1-0.5) + \frac{105-97}{10}}{\frac{105+97}{2}} = 7.7 \text{ percent}$$

Cost of Term Loans

The cost of the term loans will be simply equal to the interest rate multiplied by (1 – tax rate). The interest rate to be used here will be the interest rate applicable to the new term loan. The interest is multiplied by (1 – tax rate) as interest on term loans is also tax deductible.

$$k_t = I(1-t)$$

Where,

I = Interest rate
t = Tax rate.

Cost of Preference Capital

The cost of a redeemable preference share (k_p) is defined as that discount rate which equates the proceeds from preference capital issue to the payments associated with the same i.e. dividend payment and principal payments, which can be

$$P = \sum_{t=1}^{n} \frac{D}{(1+k_p)^t} + \frac{F}{(1+k_p)^n} \quad \text{.....(3)}$$

where,

k_p = cost of preference capital

D = preference dividend per share payable annually

F = redemption price

P = net amount realized per share and

n = maturity period

An approximation formula as given below can also be used.

$$k_p = \frac{D + \frac{F-P}{n}}{\frac{F+P}{2}} \quad \text{.....(4)}$$

Illustration 11.2

The terms of the preference share issue made by Color-Dye-Chem are as follows: Each preference share has a face value of Rs.100 and carries a dividend rate of 14 percent payable annually. The share is redeemable after 12 years at par. If the net amount realized per share is Rs.95, what is the cost of the preference capital?

Solution

Given that D = 14, F = 100, P = 95 and n = 12

$$k_p = \frac{14 + \frac{100-95}{12}}{\frac{100+95}{2}} = 0.148 \text{ or } 14.8 \text{ percent}$$

Cost of Equity Capital

Measuring the rate of return required by the equity shareholders is a difficult and complex exercise because the dividend stream receivable by the equity shareholders is not specified by any legal contract (unlike in the case of debenture holders). Several approaches are adopted for estimating this rate of return like the dividend forecast approach, capital asset pricing approach, realized yield approach, earnings-price ratio approach, and the bond yield plus risk premium approach.

According to the dividend forecast approach, the intrinsic value of an equity stock is equal to the sum of the present values of the dividends associated with it, i.e.,

$$P_e = \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t} \quad \text{.....(5)}$$

where,

P_e = price per equity share

D_t = expected dividend per share at the end of year one, and

k_e = rate of return required by the equity shareholders.

If we know the current market price (P_e) and can forecast the future stream of dividends, we can determine the rate of return required by the equity shareholders (k_e) from equation (5) which is nothing but the cost of equity capital.

In practice, the model suggested by equation (5) cannot be used in its present form because it is not possible to forecast the dividend stream completely and accurately over the life of the company. Therefore the growth in dividends can be categorized as nil or constant growth or super normal growth and the equation (5) can be modified accordingly. How to value a security given the required rate of return and pattern of growth, has already been discussed in the chapter 'Valuation of Securities'. Cost of equity from the company's point of view is nothing but the rate at which the intrinsic value of the market price of the share is equal to the discounted value of the dividends. For instance, assume a constant growth rate (g) in DPS. Assuming a constant growth rate in dividends, the equation (5) can be simplified as follows:

$$P_e = \frac{D_1}{k_e - g} \qquad \text{.....(6)}$$

If the current market price of the share is given (P_e), and the values of D_1 and g are known, then the equation (6) can be rewritten as $k_e = \frac{D_1}{P_e} + g$

The following Illustration illustrates the application of this formula.

Illustration 11.3

The market price per share of Mobile Glycols Limited is Rs.125. The dividend expected per share a year hence is Rs.12 and the DPS is expected to grow at a constant rate of 8 percent per annum. What is the cost of the equity capital to the company?

Solution

The cost of equity capital (k_e) will be:

$$k_e = \frac{D_1}{P_e} + g = \frac{12}{125} + 0.08 = 17.6 \text{ percent}$$

Realized Yield Approach

According to this approach, the past returns on a security are taken as a proxy for the return required in the future by the investors. The assumptions behind this approach are that (a) the actual returns have been in line with the expected returns, and (b) the investors will continue to have the same expectations from the security. As these assumptions generally do not hold good in real life, the results of this approach are normally taken as a starting point for the estimation of the required return.

The realized return over a n-year period is calculated as $(W_1 \times W_2 \times \ldots\ldots W_n)^{1/n} - 1$

Where W_t, referred to as the wealth ratio, is calculated as $\frac{D_t + P_t}{P_{t-1}}$ and t = 1, 2.... n.

D_t = Dividend per share for year t payable at the end of year

P_t = Price per share at the end of year t.

Illustration 11.4

Year	1	2	3
DPS(Rs.)	1.50	2.00	1.50
Price per share at the end of the year	12.00	11.00	12.00

The wealth ratios are

If the price per share at the beginning of the year 1 is Rs.10.

Year	1	2	3
Wealth ratio	1.35	1.08	1.23

Realized yield $= (1.35 \times 1.08 \times 1.23)^{1/3} - 1$

$= 0.2149$ or 21.5%

Capital Assets Pricing Model Approach

According to this approach, the cost of equity is reflected by the following equation:

$$k_i = R_f + \beta_i (R_m - R_f) \quad \text{.....(7)}$$

where,

k_i = rate of return required on security i

R_f = risk-free rate of return

β_i = beta of security i

R_m = rate of return on market portfolio

Bond Yield Plus Risk Premium Approach

The logic behind this approach is that the return required by the investors is directly based on the risk profile of a company. This risk profile is adequately reflected in the return earned by the bondholders. Yet, since the risk borne by the equity investors is higher than that by the bondholders, the return earned by them should also be higher. Hence this return is calculated as:

Yield on the long-term bonds of the company + Risk premium.

This risk premium is a very subjective figure which is arrived at after considering the various operating and financial risks faced by the firm. Though these risks are already factored in the bond yield, since by nature equity investment is riskier than investments in bonds and is exposed to a higher degree of the firm's risks, they also have an impact on the risk-premium. For example, let us take two companies A and B, A having a net profit margin of 5% and B of 10% with other things being equal. Since company B faces less downside risk compared to company A, it will have to pay less interest to its bondholders. Hence, the risk of a company is already accounted for in the bondholders' return. Yet, when it comes to estimating the equityholders' risk premium, these risks are considered all over again because the equityholders are going to bear a larger part of these risks. In fact, these risks being taken into account for fixing the bondholders' return will result in a multiple increase in the equityholders' risk. Hence, the equityholders of company A will receive a higher risk premium than those of company B.

Earnings Price Ratio Approach

According to this approach, the cost of equity can be calculated as E_1/P

where,

E_1 = expected EPS for the next year

P = current market price per share

E_1 can be arrived at by multiplying the current EPS by (1 + growth rate).

This ratio assumes that the EPS will remain constant from the next year onwards.

There are two parameters which have to be analyzed to see if this approach will provide an accurate result or not. They are dividend pay-out ratio and the rate of return the firm is capable of earning on the retained earnings. The results are accurate in the following two scenarios.

a. When all the earnings are paid out as dividends. Here the rate of return the firm is capable of earning becomes irrelevant.

or,

b. The dividend pay-out ratio is less than 100 percent and retained earnings are expected to earn a rate of return equal to the cost of equity.

In all other cases there is scope for this approach not giving an accurate estimate. The option (a) is not normally seen in real life situations, while it is difficult to foresee the option (b). This approach should hence be used with caution.

Cost of Retained Earnings and Cost of External Equity

Earnings of a firm can be reinvested or paid as a dividend to the shareholder. If the firm retained part of its earnings for future growth of the firm, the shareholder will demand compensation from the firm for using that money. As a result, the cost of retained earnings simply represents a shareholder's expected return from the firm's common stock. Viewing retained earnings as fully subscribed issued of additional common stock we can set the firm's cost of retained earnings K_r to the cost of equity capital.

i.e. $K_r = K_e$

The cost of retained earnings is always less than the cost of new issue of common stock due to absence of floating costs when projects with retained earnings.

Cost of external equity comes into the picture when there are certain floatation costs involved in the process of raising equity from the market. It is the rate of return that the company must earn on the net funds raised, in order to satisfy the equityholders' demand for return. Under the dividend capitalization model, the following formula can be used for calculating the cost of external equity:

$$K'_e = \frac{D_1}{P_0\,(1-f)} + g$$

where,

K'_e = cost of external equity

D_1 = dividend expected at the end of year 1

P_o = current market price per share

g = constant growth rate applicable to dividends

f = floatation costs as a percentage of the current market price.

For all other approaches, there is no particular method for accounting for the floatation costs. The following formula can be used as an approximation in such cases:

$K'_e = k_e/(1 - f)$

where,

k_e = rate of return required by the equity investors

K'_e = cost of external equity

f = floatation costs as a percentage of the current market price.

Illustration 11.5

Gamma Asbestos Limited has got Rs.100 lakh of retained earnings and Rs.100 lakh of external equity through a fresh issue, in its capital structure. The equity investors expect a rate of return of 18%. The cost of issuing external equity is 5%. The cost of retained earnings and the cost of external equity can be determined as follows:

Cost of retained earnings:

$k_r = k_e$ i.e., 18%

Cost of external equity raised by the company:

$$\text{Now } K'_e = \frac{k_e}{1-f} = \frac{0.18}{1-0.05} = 18.95\%$$

CONCEPT OF WEIGHTED AVERAGE COST OF CAPITAL

To illustrate the calculation of the weighted average cost of capital, let us consider the following illustration.

Illustration 11.6

Ventura Home Appliances Ltd. has the following capital structure:

(Rs. in lakh)

Equity Capital (10 lakh shares at par value)	100
12 percent preference capital (10,000 shares at par value)	10
Retained earnings	120
14% Non-convertible Debentures (70,000 debentures at par value)	70
14% term loan from APSFC	100
Total	400

The market price per equity share is Rs.25. The next expected dividend per share (DPS) is Rs.2.00 and the DPS is expected to grow at a constant rate of 8 percent. The preference shares are redeemable after 7 years at par and are currently quoted at Rs.75 per share on the stock exchange. The debentures are redeemable after 6 years at par and their current market quotation is Rs.90 per share. The tax rate applicable to the firm is 50 percent. Calculate the weighted average cost of capital.

Solution

We will adopt a three-step procedure to solve this problem.

Step 1: Determine the costs of the various sources of finance. We shall define the symbols k_e, k_r, k_p, k_d and k_i to denote the costs of equity, retained earnings, preference capital, debentures, and term loans respectively.

$$k_e = \frac{D_1}{P_0} + g$$

$$= \frac{2.00}{25} + 0.08 = 0.16$$

$$k_r = k_e = 0.16$$

$$k_p = \frac{D + \frac{F - P}{n}}{\frac{F + P}{2}}$$

$$= \frac{12 + \frac{100 - 75}{7}}{\frac{100 + 75}{2}} = 0.1780$$

$$k_d = \frac{I(1 - t) + \frac{F - P}{n}}{\frac{F + P}{2}}$$

$$= \frac{14\,(1 - 0.5) + \frac{100 - 90}{6}}{\frac{100 + 90}{2}} = 0.0912$$

$$k_i = 0.14\,(1 - 0.5) = 0.07$$

Note: Market price can be taken as a close substitute of the net amount realizable per share or debenture.

Step 2: Determine the weights associated with the various sources of finance.

One issue to be resolved before concluding this section relates to the system of weighting that must be adopted for determining the weighted average cost of capital. The weights can be used on (i) book values of the sources of finance included in the present capital structure (ii) present market value weights of the sources of finance included in the capital structure and (iii) proportions of financing planned for the capital budget to be adopted for the forthcoming period.

Let us assume the book value approach and the weights of a source of fund, according to book value approach is equal to the book value of that particular source divided by the total of the book values of all sources i.e., weight given to equity would be equal to book value of equity divided by book value of equity, retained earnings, debt, preference shares (if any). Similarly the weights according to the market value approach is equal to the market value of a particular source divided by the market value of all sources. For instance, weight attached to equity is equal to the market value of equity divided by the market value of equity, debt, preference shares, if any.

We shall define the symbols W_e, W_r, W_p, W_d and W_i to denote the weights of the various sources of finance.

$$W_e = \frac{100}{400} = 0.25$$

$$W_r = \frac{120}{400} = 0.30$$

$$W_p = \frac{10}{400} = 0.025$$

$$W_d = \frac{70}{400} = 0.175$$

$$W_i = \frac{100}{400} = 0.25$$

Step 3: Multiply the costs of the various sources of finance with the corresponding weights and add these weighted costs to determine the weighted average cost of capital (WAC). Therefore,

$$WAC = W_e k_e + W_r k_r + W_p k_p + W_d k_d + W_i k_i$$

$$= (0.25 \times 0.16) + (0.30 \times 0.16) + (0.025 \times 0.1780) + (0.175 \times 0.0912) + (0.25 \times 0.07)$$

$$= 0.1259 \text{ or } 12.59 \text{ percent.}$$

WEIGHTED MARGINAL COST OF CAPITAL SCHEDULE

At the time of developing the concept of cost of capital, we had assumed that the risk profile and financing policy of the firm do not change. Now the question that arises is if these assumptions hold, does the weighted average cost of capital remains unchanged irrespective of the magnitude of financing? It does not. Normally, the WACC increases with the level of financing required. The suppliers of capital generally require a higher return as they supply more capital. A schedule showing the relationship between additional financing and the weighted average cost of capital is referred to as the **weighted marginal cost of capital schedule**.

Determining the Weighted Marginal Cost of Capital Schedule

The following steps have to be followed for determining the weighted marginal cost of capital schedule:

1. The cost of each individual source of finance for various levels of usage has to be estimated.
2. Given the ratio of different sources of finance in the new capital structure, find out the levels of total new financing at which the cost of various sources would change. These levels, called breaking points, can be found out as:

   Breaking Point on Account of a Source

   $$= \frac{\text{Total new financing from that source at the breaking point}}{\text{Proportion of that financing source in the capital structure}}$$

3. Calculate the weighted average cost of capital for various ranges of total financing between the breaking points.
4. List out the weighted average cost of capital for each level of total new financing. This is the weighted marginal cost of capital schedule.

We can illustrate the preparation of the weighted marginal cost of capital schedule with the help of an illustration. Consider the following illustration:

Illustration 11.7

Crypton Limited is planning to raise equity, preference and debt capital in the following proportions:

Equity : 0.50

Preference : 0.20

Debt : 0.30

The cost of the three sources of finance for different levels of usage has been estimated as below:

Source of Finance	Range of new financing from the source (Rs. in lakh)	Cost %
Equity	0-15	16.00
	15-25	17.00
	25 and above	18.00
Preference	0-3	14.00
	3 and above	15.00
Debt	0-20	8.00
	20 and above	10.00

Calculation of Breaking Point

Source of Finance	Cost %	Range of new Financing (Rs. in lakh)	Breaking Point (Rs. in lakh)	Range of Total new Financing (Rs. in lakh)
Equity	16.00	0-15	15/0.5 = 30	0-30
	17.00	15-25	25/0.5 = 50	30-50
	18.00	25 and above	–	50 and above
Preference	14.00	0-3	3/0.2 = 15	0-15
	15.00	3 and above	–	15 and above
Debt	8.00	0-20	20/0.3 = 66.67	0-66.67
	10.00	20 and above	–	66.67 and above

Weighted Average Cost of Capital for Various Ranges of Total New Financing.

Range of Total New Financing (Rs. in lakh)	Source of Finance	Proportion	Cost (%)	Weighted cost (%)
0-15	Equity	0.5	16	8.00
	Preference	0.2	14	2.80
	Debt	0.3	8	2.40
	Weighted Average Cost of Capital			**13.20**
15-30	Equity	0.5	16	8.00
	Preference	0.2	15	3.00
	Debt	0.3	8	2.40
	Weighted Average Cost of Capital			**13.40**
30-50	Equity	0.5	17	8.50
	Preference	0.2	15	3.00
	Debt	0.3	8	2.40
	Weighted Average Cost of Capital			**13.90**
50-66.67	Equity	0.5	18	9.00
	Preference	0.2	15	3.00
	Debt	0.3	8	2.40
	Weighted Average Cost of Capital			14.40
66.67 and above	Equity	0.5	18	9.00
	Preference	0.2	15	3.00
	Debt	0.3	10	3.00
	Weighted Average Cost of Capital			15**.00**

Weighted Marginal Cost of Capital Schedule

Range of Total New Financing (Rs. in lakh)	Weighted Marginal Cost of Capital (%)
0-15	13.2
15-30	13.4
30-50	13.9
50-66.67	14.4
66.67 and above	15.0

SECTION 2: MEANING OF CAPITAL STRUCTURE

The capital structure of a company refers to the mix of the long-term finances used by the firm. It is the financing plan of the company. Let us take a look at the capital structure of a company that has recently gone in for public issue.

Pennar Aluminium Company Limited has gone in for a project to manufacture Aluminium Rolled Products, Alloy Conductors and Aluminium Alloys. For raising finance, the company went in for a public issue of 1,93,45,000 equity shares of Rs.10 each at par and 28,25,000 secured PCDs of Rs.200 each. The capital structure of the company including the present issue as per the prospectus of the company was:

(Rs. in lakh)

A.	Authorized Capital 9,00,00,000 Equity shares of Rs.10 each	9,000.00
B.	Issued, subscribed and paid-up capital	825.50
C.	Present Issue	
	– Equity Shares at par	1934.50
	– 16% Secured PCDs	5,650.00
D.	Rupee Term Loan from Institutions and Banks	5,060.00
E.	Buyers Credit	1,350.00
		14,820.00

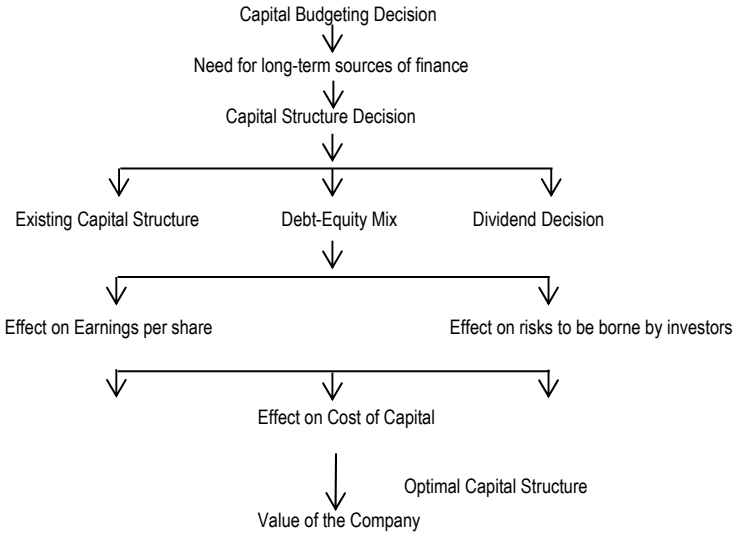
Importance of the Capital Structure Decision

The objective of any company is to mix the permanent sources of funds used by it in a manner that will maximize the company's market price. In other words companies seek to minimize their cost of capital. This proper mix of funds is referred to as the Optimal Capital Structure.

The capital structure decision is a significant managerial decision which influences the risk and return of the investors. The company will have to plan its capital structure at the time of promotion itself and also subsequently whenever it has to raise additional funds for various new projects. Wherever the company needs to raise finance, it involves a capital structure decision because it has to decide the amount of finance to be raised as well as the source from which it is to be raised.

The capital structure decision process can be represented diagrammatically as:

Figure 11.1: Process of Capital Structure Decisions



FACTORS AFFECTING THE CAPITAL STRUCTURE

Leverage: The use of fixed charges sources of funds such as preference shares, debentures and term loans along with equity capital in the capital structure is described as financial leverage or trading on equity. The term trading on equity is used because it is the equity that is used as a basis for raising debt. Financial Institutions while sanctioning long-term loans insist that companies should generally have a debt-equity ratio of 2:1 for medium and large-scale industries and 3:1 for small-scale industries. A debt-equity ratio of 2:1 indicates that for every 1 unit of equity the company has, it can raise 2 units of debt. The ratio is calculated using the formula $\frac{\text{Debt}}{\text{Equity}}$.

Increased use of leverage increases the fixed commitments of the company in the form of interest and repayments and thus increases the risk of the equity shareholders as their returns are affected.

The other factors that should be considered whenever a capital structure decision is taken are:

a. Cost of capital
b. Cash flow projections of the company
c. Size of the company
d. Dilution of control
e. Floatation costs.

Features of an Optimal Capital Structure

An optimal capital structure should have the following features:

- **Profitability** – The company should make maximum use of leverage at a minimum cost.
- **Flexibility** – The capital structure should be flexible to be able to meet the changing conditions. The company should be able to raise funds whenever the need arises and also retire debts whenever it becomes too costly to continue with that particular source.
- **Control** – The capital structure should involve minimum dilution of control of the company.
- **Solvency** – The use of excessive debt threatens the solvency of the company. In a high interest rate environment, Indian companies are beginning to realize the advantage of low debt. Companies are now launching public issues with the sole purpose of reducing debt. The recent equity issue of more than Rs.30 crore by Ballarpur Industries was purely aimed at repaying term loans and retiring debentures.

THEORIES OF CAPITAL STRUCTURE

Equity and debt capital are the two important sources of long-term finance for a firm. What should be the proportion of equity and debt in the capital structure of a firm, i.e. how much financial leverage should a firm employ? The answer is quite difficult and is based on an understanding of the relationship between the financial leverage and firm valuation or financial leverage and cost of capital. First of all, one should know whether there is any relationship between the financial leverage and firm valuation. To understand this, many approaches have been propounded, some say that there exists a relationship between the two and some state that there is no relation.

Assumptions and Definitions

The following are some of the common assumptions made to understand the relationship between financial leverage and cost of capital.

i. There is no income tax, corporate or personal.

ii. The firm has a policy of paying its earnings as dividend, i.e. a 100% dividend pay-out ratio is assumed.

iii. Investors have identical subjective probability distributions of net operating income (earnings before income and taxes) for each company.

iv. The net operating income is not expected to grow or decline over time.

v. Without incurring transaction costs, a firm can change its capital structure instantaneously.

Based on the above assumptions and some more stated as and when required, the cost of debt, equity and the firm are derived as follows:

Assuming that the debt capital is perpetual, k_d represent the cost of debt which is the discount rate at which discounted future constant interest payments are equal to the market value of debt i.e.

$$B = \sum_{t=1}^{\infty} \frac{F}{(1+k_d)^t} \text{ or}$$

$$k_d = \frac{F}{B} = \frac{\text{Annual Interest Charges}}{\text{Market Value of Debt}} \quad \text{.....(8)}$$

Based on the assumption of 100% dividend pay-out and constant earnings, cost of equity is the discount rate at which the discounted future dividend (or earnings) are equal to the MV of equity, i.e.

$$S = \sum_{t=1}^{¥} \frac{E}{(1+k_e)^t} \text{ or}$$

$$k_e = \frac{E}{S} = \frac{\text{Equity Earnings}}{\text{Market Value of Equity}} \quad \text{.....(9)}$$

Given the net operating income to be constant, the cost of capital of the firm, k_o is the discount rate at which the present value of net operating income is equal to the market value of the firm (i.e., sum of the market values of debt and equity). Hence,

$$K_0 = \frac{O}{V} = \frac{\text{Net Operating Income}}{\text{Market Value of the Firm}}$$

Where V = B + S and k_o is the overall capitalization rate for the firm. Since it is the weighted average cost of capital, it may be expressed as

$$k_o = k_d B/(B + S) + k_e S/(B + S) \quad \text{.....(10)}$$

Measured by the ratio B/S, what happens to k_d, k_e and k_o when financial leverage changes? The answer to this question is discussed below:

Net Income Approach

According to this approach, the cost of equity capital (k_e) and the cost of debt capital (k_d) remain unchanged when B/S, the degree of leverage varies. This means that k_o, the average cost of capital, measured as

$$k_o = k_d B/(B + S) + k_e S/(B + S)$$

declines as B/S increases. This happens because when B/S increases, k_d, which is lower than k_e, receives a higher weight in the calculation of k_o.

The following is the graphical representation of net income approach. B/S, the degree of leverage is plotted on the x-axis, k_e, k_d, and k_o are plotted on the y-axis.

From the graph it is clear that as B/S increases, k_o decreases because the proportion of debt, the cheaper source of finance, increases in the capital structure.

Figure 11.2

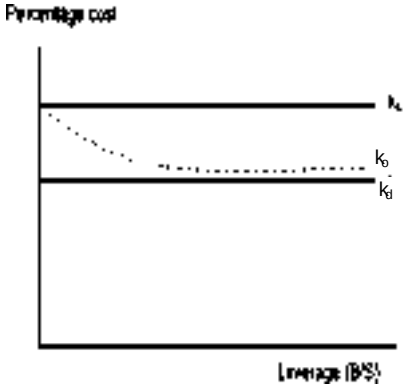


Illustration 11.8

The net income approach may be illustrated with a numerical Illustration. Consider two firms X and Y, which are identical in all respects except in the degree of leverage employed by them. The following is the financial data for these firms.

	Firm X	Firm Y
Net Operating Income (O)	Rs.20,000	Rs.20,000
Interest on Debt (F)	Rs.0	Rs,5,000
Equity Earnings (E)	Rs.20,000	Rs.15,000
Cost of Equity Capital (k_e)	12%	12%
Cost of Debt Capital (k_d)	10%	10%
Market Value of Equity (S = E/k_e)	Rs.1,66,667	Rs.1,25,000
Market Value of Debt (B)	Rs.0	Rs.50,000
Total Value of Firm (V)	Rs.1,66,667	Rs,1,75,000

The average cost of capital for firm X:

$$10\% \text{ x } \frac{0}{1{,}66{,}667} + 12\% \text{ x } \frac{1{,}66{,}667}{1{,}66{,}667} = 12\%$$

The average cost of capital for firm Y:

$$10\% \text{ x } \frac{50{,}000}{1{,}75{,}000} + 12\% \text{ x } \frac{1{,}25{,}000}{1{,}75{,}000} = 11.43\%$$

Net Operating Income Approach

According to the net operating income approach, the overall capitalization rate and the cost of debt remain constant for all degrees of leverage. Therefore, in the following equation k_o and k_d are constant for all degrees of leverage.

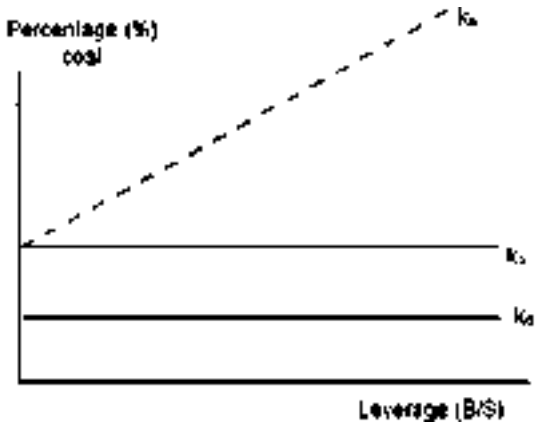
$$k_o = k_d B/(B + S) + k_e S/(B + S)$$

Therefore, the cost of equity can be expressed as:

$$k_e = k_o + (k_o - k_d)(B/S) \quad \text{.....(11)}$$

The behavior of k_d, k_e and k_o in response to changes in B/S is shown graphically as:

Figure 11.3



The critical assumption with this approach is that k_o is constant, regardless of the degree of leverage. The market capitalizes the value of the firm as a whole and therefore, the breakdown between debt and equity is unimportant. An increase in the use of supposedly "cheaper" debt funds is compensated exactly by the increase in the required equity return, k_e. Therefore, the weighted average of k_e and k_d remains unchanged for all degrees of leverage. As the firm increases its degree of leverage, it becomes more risky. Investors penalize the stock by raising required equity return with the view of increase in the debt-to-equity ratio. As long as k_d remains constant, k_e is a constant linear function of the debt-to-equity ratio. Because the cost of capital of the firm, k_o, cannot be altered through leverage, the net operating income approach implies that there is no optimal capital structure.

The net operating income position has been advocated eloquently by David Durand. According to him, the market value of a firm depends on its net operating income and business risk. The change in the degree of leverage employed by a firm cannot change these underlying factors. Changes take place in the distribution of income and risk between debt and equity without affecting the total income and risk which influence the market value of the firm. Hence the degree of leverage cannot influence the market value or the average cost of capital of the firm.

Illustration 11.9

Consider two firms MN and XY which are similar in all respects other than the degree of leverage employed by them. The following is the financial data of both these firms.

	Firm MN	Firm XY
Net Operating Income (O)	Rs.15,000	Rs.15,000
Overall Capitalization Rate (k_o)	0.17	0.17
Total Market Value (V)	Rs.88,235	Rs.88,235
Interest on Debt (F)	Rs.1500	Rs.3,500
Debt Capitalization Rate (k_d)	0.12	0.12
Market Value of Debt ($B = F/k_d$)	Rs.12,500	Rs.29,167
Market Value of Equity ($S = V - B$)	Rs.75,735	Rs.59,068
Degree of Leverage (B/S)	0.165	0.494

The equity capitalization rates of firms MN and XY are:

Firm MN:

$$\frac{\text{Equity Earnings}}{\text{Market Value of Equity}} = \frac{13,500}{75,735} = 17.83\%$$

Firm XY:

$$\frac{\text{Equity Earnings}}{\text{Market Value of Equity}} = \frac{11,500}{59,068} = 19.47\%$$

The equity capitalization rates for the above firms can also be calculated by using equation (11) i.e.,

$k_e = k_o + (k_o - k_d)B/S$

Firm MN: $k_e = 0.17 + (0.17 - 0.12)(0.165) = 17.83\%$

Firm XY: $k_e = 0.17 + (0.17 - 0.12)(0.494) = 19.47\%$

Traditional Approach

The traditional approach has the following propositions:

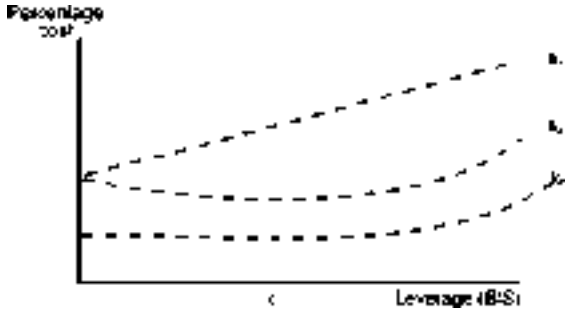
i. The cost of debt capital, k_d, remains more or less constant up to a certain degree of leverage but rises thereafter at an increasing rate.

ii. The cost of equity capital, k_e, remains more or less constant or rises only gradually up to a certain degree of leverage and rises sharply thereafter.

iii. The average cost of capital, k_o, as a consequence of the above behavior of k_e and k_d (a) decreases up to a certain point; (b) remains more or less unchanged for moderate increases in leverage thereafter, and (c) rises beyond a certain point.

The following is the graphical representation of the traditional approach.

Figure 11.4



The principal implication of the approach is that the cost of capital is dependent on the capital structure and there is an optimal capital structure which minimizes the cost of capital. In the above graph, it is the point X which is the optimal capital structure. At the optimal capital structure, the real marginal cost of debt and equity is the same. Before the optimal point the real marginal cost of debt is less than the real marginal cost of equity and beyond the optimal point the real marginal cost of debt is more than the real marginal cost of equity. Thus, the traditional approach implies that the cost of capital is not independent of the capital structure of the firm and that there is an optimal capital structure.

Illustration 11.10

The following is a numerical Illustration of the traditional approach. This table shows the average cost of capital for a firm which has a net operating income of Rs.1,25,000 that is split variously between interest and equity earnings depending on the degree of leverage employed by the firm.

F	E	K_d	K_e	B	S	V	K_o
Rs.	Rs.	(%)	(%)	Rs.	Rs.	Rs.	(%)
0	1,25,000	6.0	10.5	0	11,90,476	11,90,476	10.50
25,000	1,00,000	6.0	10.5	4,16,667	9,52,381	13,69,048	9.13
35,000	90,000	6.5	11.0	5,38,462	8,18,182	13,56,664	9.21
45,000	80,000	6.5	11.0	6,92,308	7,27,273	14,19,581	8.81
55,000	70,000	7.0	11.5	7,85,714	6,08,696	13,94,410	8.96
65,000	60,000	7.5	12.0	8,66,667	5,00,000	13,66,667	9.15
75,000	50,000	9.0	14.0	8,33,333	3,57,143	11,90,476	10.50
85,000	40,000	11.0	16.0	7,72,727	2,50,000	10,22,727	12.22
95,000	30,000	15.0	18.0	6,33,333	1,66,667	8,00,000	15.63
1,05,000	20,000	18.0	20.0	5,83,333	1,00,000	6,83,333	18.29

Miller and Modigliani Approach

Modigliani and Miller in their paper have stated that the relationship between leverage and the cost of capital is explained by the net operating income approach in terms of three basic propositions. They argue against the traditional approach by offering behavioral justification for having the cost of capital, k_o, remain constant throughout all degrees of leverage. It is therefore essential to spell out the assumptions underlying their analysis.

1. Capital markets are perfect. Information is costless and readily available to all investors. There are no transaction costs, and all securities are infinitely divisible.
2. Investors are assumed to be rational and behave accordingly i.e., choose a combination of risk and return that is most advantageous to them.
3. The average expected future operating earnings of a firm are subjected by random variables. It is assumed that the expected probability distribution values of all the investors are the same. The MM theory implies that the expected probability distribution values of expected operating earnings for all future periods are the same as present operating earnings.
4. Firms can be grouped into “equivalent return” classes on the basis of their business risks. All firms falling into one class have the same degree of business risk.
5. There is no corporate or personal income tax.

Basic Propositions

MM derived the following three propositions based on the above assumptions.

Proposition I: The total market value of the firm which is equal to the total MV of debt and market value of equity is independent of the degree of leverage and is equal to its expected operating incomes discounted at the rate appropriate to its risk class.

Symbolically, it is represented as:

$$V_j = S_j + B_j = O_j/\rho_k \quad \text{.....(12)}$$

where,

V_j = total market value of the firm j

S_j = market value of the equity of the firm j

B_j = market value of the debt of the firm j

O_j = expected operating income of the firm j

ρ_k = discount rate applicable to the risk class k to which the firm j belongs.

Proposition II: The expected yield on equity, i_j, is equal to ρ_k plus a premium which is equal to the debt-equity ratio times the difference between k and the yield on debt, r.

Symbolically it is represented as

$$i_j = \rho_k + (\rho_k - r)Bj/Sj \quad \text{.....(13)}$$

Proposition III: The manner in which an investment is financed does not affect the cut-off rate for the investment decision-making for a firm in a given risk class. The proposition emphasizes the point that average cost of capital is not affected by the financing decisions as both investment and financing decisions are independent.

Proof of MM Argument – The Arbitrage Mechanism

To prove their argument, MM suggested an Arbitrage mechanism. Two firms X and Y in the same risk class and same expected operating incomes but with varying financial leverages are considered.

	X	Y
Expected Operating Income	O	O
Market Value of Equity	S_x	S_y
Market Value of Debt	–	B_y
Market Value on the Firm	V_x	V_y
Interest Rate on Debt	–	r
Interest Burden	–	rB_y

Consider the case wherein the unlevered firm X has a market value which is less than that of the levered firm Y, (V_x, < V_y). Now if an investor holds S_y rupees worth of equity shares of firm Y, representing a fraction of the total outstanding market value of equity shares of firm Y($s_y = \alpha S_y$), the return he gets is:

$$P_y = \alpha\ (O - r\ B_y) \quad \text{.....(14)}$$

If the same investor sells his shares i.e., αS_y worth of shares of firm Y and borrows α By at an interest rate of r percent on his personal account, then he can purchase $\alpha\ (S_y + B_y)/S_x$ of the equity shares of firm X. (For firm X, $V_x = S_x$ since it is an all-equity firm).

After the above transactions, the return obtained by the investor would be:

$$P_x = \alpha \frac{(S_y + B_y)}{S_x} O - r\,\alpha\, B_y = \alpha \frac{V_y}{V_x} O - r\,\alpha\, B_y \quad \text{.....(15)}$$

Comparing the above equations (14) and (15) we find that as long as $V_y > V_x$, we have $P_x > P_y$, which means that the equity shareholders of firm Y will sell their shareholding and acquire shares of firm X by resorting to personal leverage since it is profitable to do so. In this process S_y (and hence V_y) will get depressed and S_x (and hence V_x) will rise till the equality between V_x and V_y is established. Hence, the difference in the values of the levered firm and the unlevered firm would be abolished by the personal leverage of the investors.

Next is the case wherein $V_x > V_y$. Here, let us put $V_x/V_y = \beta > 1$. For instance, if an investor holds equity shares worth S_x of firm X, representing a fraction α_x of the total market value of the outstanding shares, S_x, the return he gets is:

$$P_x = \frac{s_x}{S_x} O = \alpha O \quad \text{.....(16)}$$

If he sells his shareholding worth αV_x ($V_x = S_x$) he can buy a fraction $\alpha\beta$ of the equity shares and bonds of firm Y because the market value of the firm X is β times the market value of the firm Y which will therefore make his return equal to:

$$P_y = \alpha\beta (O - r B_y) + \alpha\beta (r B_y) = \alpha\beta O \quad \text{.....(17)}$$

without any change in the level of risk borne by him.

Comparing the above equations (16) and (17), we find that as long as $V_x > V_y$ ($\beta > 1$), we have $P_y > P_x$ which means that equity shareholders of firm X will sell their shareholding and buy a portfolio consisting of shares and bonds of firm Y since it is profitable to do so. In the process, V_x will get depressed and V_y will rise till the equality between V_x and V_y is established. The following is an illustration to show how the arbitrage mechanism works.

Illustration 11.11

Consider two firms P and Q similar in all respects except in their capital structure. Firm P is financed by only equity, firm Q is financed by a mixture of equity and debt. The following are the financial particulars of the two firms.

	Firm P	Firm Q
Total Capital Employed	Rs.20,00,000	Rs.20,00,000
Equity Capital	Rs.20,00,000	Rs.12,00,000
Debt	–	Rs.8,00,000
Net Operating Income	Rs.2,00,000	Rs.2,00,000
Debt Interest (@5%)	–	Rs.40,000
Market Value of Debt	–	Rs.8,00,000
Equity Earnings	Rs.2,00,000	Rs.1,60,000
Equity Capitalization Rate	10%	12%
Market Value of Equity	Rs.20,00,000	Rs.13,33,333
Total Market Value of the Firm	Rs.20,00,000	Rs.21,33,333
Average Cost of Capital	10%	9.38%
Debt Equity Ratio (in terms of Market Value)	0	0.6

The market value of the levered firm Q is higher than that of the unlevered firm P. MM argue that in such a situation equityholders would sell their equity investment in firm Q and invest in the equity of firm P resorting to personal leverage. For instance, an equity investor who owns 1 percent equity in firm Q would:

1. Sell his equity in firm Q for Rs.13,333
2. Borrow 1% of the debt of the firm Rs.8,000 at 5 percent interest on personal account and
3. Buy Rs.21,333 worth of shares i.e. 1.0667 percent of the equity of firm P.

The sequence of above transactions would result in:

Income on investment in firm P (1.0667% of Rs.2,00,000)	2,133.3
Less: Interest (8,000 x 0.05)	400.0
Net Income	1,733.3

This net income is higher than a net income of Rs.1,600 forgone by selling 1 percent equity of firm Y and when the leverage ratio is the same in both the cases.

The action of a number of investors undertaking similar arbitrage transactions result in driving up the price of firm P shares, lower its equity capitalization rate, drive down the price of firm Q, and increase its equity capitalization rate. This process of arbitrage will continue till there is no further opportunity for reducing one's investment outlay and achieving the same return. As a result, the average costs of capital, k_o, would be the same. The principle involved here is simply that investors are able to reconstitute their former positions by offsetting changes in corporate leverage with changes in personal leverage.

Criticisms of MM Proposition

TAXATION AND CAPITAL STRUCTURE

The irrelevance of capital structure rests on the absence of market imperfections. Though debt and equity are two different parts there is something called conservation of value, wherein the sum of parts is always the same. However, in the face of imperfections in the capital markets, the capital structure of a firm may affect the valuation i.e. the firm's valuations and cost of capital may change with changes in its capital structure.

CORPORATE TAXES

Presence of taxes is one of the major imperfections. Debt Financing is advantageous when taxes are applicable to corporate income. The reason is that the dividends and retained earnings are not deductible for tax purposes, whereas interest on debt is a tax-deductible expense. Hence, the combined income of stockholders and debtholders is greater when debt capital is used.

Illustration 11.12

Consider two firms A and B having an expected net operating income of Rs.5,00,000 which are similar in all respects except in the degree of leverage employed by them. Firm A employs no debt capital whereas firm B has Rs.20,00,000 in debt capital on which it pays 12 percent interest. The corporate tax rate applicable to both the firms is 50%. The income to stockholders and debtholders of both the firms is shown below.

	Rs. Firm A	Rs. Firm B
Net Operating Income	5,00,000	5,00,000
Interest on Debt	–	2,40,000
Profit before Taxes	5,00,000	2,60,000
Taxes	2,50,000	1,30,000
Profit after Tax (Income available to stockholders)	2,50,000	1,30,000
Combined Income of Debtholders and Stockholders	2,50,000	3,70,000

It is quite clear from the above table that the combined income of debtholders and stockholders of the levered firm B is higher than that of the unlevered firm A.

The explanation for this is: the interest payment of Rs.2,40,000 made by the levered firm brings a tax shield of Rs.1,20,000 (Rs.2,40,000 x Tax rate). Therefore, the combined income of the debtholders and stockholders of firm B is higher by this amount.

The present value of tax shield associated with interest payments, assuming debt to be perpetual in nature would be equal to

Present value of tax shield = $\frac{t_c B r}{r} = t_c B$ .....(18)

where,

t_c = corporate tax rate
B = market value of debt
r = interest rate on debt

In the above Illustration, for firm B, the present value of tax shield works out to: 0.5(20,00,000) = Rs.10,00,000 which represents the increase in market value arising from financial leverage.

In general, when corporate taxes are considered the value of the firm that is levered would be equal to the value of the unlevered firm increased by the tax shield associated with debt, i.e.

$$V = \frac{O(1-t_c)}{k} + t_c B \quad \text{.....(19)}$$

From the above equation it is quite clear that other things being equal, greater the leverage, greater is the value of the firm. This implies that the optimal strategy of a firm should be to maximize the degree of leverage in its capital structure.

Corporate Taxes and Personal Taxes

When personal taxes are considered along with corporate taxes and investors pay the same rate of personal taxes on debt returns as well as stock returns, the advantage of corporate tax in favor of debt capital remains intact.

Consider a 30% personal tax rate to debt as well as stock returns in the above Illustration. The income to debtholders and stockholders after taxes, both corporate and personal is calculated below:

Personal Taxes and Income of Debtholders and Stockholders

	Firm A	Firm B
Income available to stockholders	2,50,000	1,30,000
Less: Personal taxes at 30%	75,000	39,000
Income available to stockholders after personal tax	1,75,000	91,000
Income to debtholders	0	2,40,000
Less: Personal taxes at 30%	–	72,000
Income to debtholders after personal taxes	0	1,68,000
Combined income of stockholders and debtholders after personal taxes	1,75,000	2,59,000

From the above table, it is clear that although the combined post-tax income to stockholders and debtholders decreases in both the firms, the proportional advantage of debt remains unaffected because the combined income of stockholders and debtholders is still higher by 48% in the levered firm.

If the personal tax rate is t_p the tax advantage of debt becomes: $t_c B(1 - t_p)$.

The above formula is valid when personal tax rate applicable to stock as well as debt income is same as in the above Illustration. However, it is not the same in many countries including India. Stock income, which includes dividend income and capital gains is taxed at a lower rate when compared to that of debt income.

When the tax rate on stock income (t_{ps}) differs from the tax rate on debt income (t_{pd}) the tax advantage of debt capital may be expressed as:

$$\left[1 - \frac{(1-t_c)(1-t_{ps})}{(1-t_{pd})}\right] \text{x B}$$

t_c = corporate tax rate
t_{pd} = personal tax rate on debt income
t_{ps} = personal tax rate on equity income .....(20)

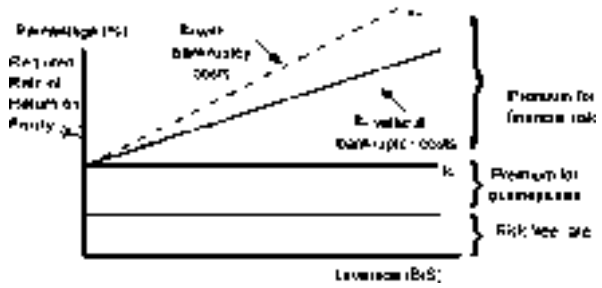
Bankruptcy Costs

Existence of bankruptcy costs is another important imperfection affecting the capital structure. Capital Market when perfect, has no costs associated with bankruptcy. Assets of a bankrupt firm can be sold at their economic values and legal and administrative expenses are not present. However, in the real world, there are costs associated with bankruptcy. Under distress conditions, assets are sold at a significant discount below their economic values. Moreover, costs like legal and administrative costs associated with bankruptcy proceedings are high. Finally, an impending bankruptcy entails significant costs in the form of sharply impaired operational efficiency.

The probability of bankruptcy for a levered firm is higher than for an unlevered firm, other things being equal. Beyond a threshold level, the probability of bankruptcy increases at an increasing rate as the debt-equity ratio increases. This means that the expected cost of bankruptcy increases when the debt-equity ratio increases. Investors expect a higher rate of return from a firm which is faced with the prospect of bankruptcy, as bankruptcy costs represent a loss that cannot be diversified away. The following figure is a graphical representation of the relationship between the required rate of return on equity, ke, and the leverage ratio, B/S.

Difference Between Corporate and Home-made Leverage

Figure 11.5



The following are some differences between corporate and personal leverage:

- In the propositions given, MM has stated that the premium of the levered firm over unlevered firm would be abolished by resorting to personal leverage by the investors. However, he had assumed that the rate at which an individual borrows would be the same at which the corporate borrows. In reality, an individual may not be able to borrow on his personal account at the same rate of interest as a company can do. In India, the average rate of interest on personal borrowings is higher than the average rate of interest on corporate borrowings.
- The creditors simply refuse to lend individuals who want to employ a high leverage ratio. Therefore an individual cannot adopt a leverage as high as a company can do.
- The liability of an individual borrower towards the borrowed amount on his account is unlimited whereas the equity stockholders of a company have limited liability irrespective of the company's level of borrowing.

Agency Costs

Whenever creditors are approached by a firm to obtain debt capital, they impose certain restrictions on the firm in the form of some protective covenants incorporated in the loan contract. They could be in the form of obtaining prior approval of the creditors for matters relating to key managerial appointments, maintenance of current ratio above a certain level, restriction on the rate of dividend during the currency of the loan, constraints on the additional issue of capital, limitation on further investments etc.

The above said restrictions generally entail legal and enforcement costs which also impair the operating efficiency of the firm. All these costs referred to as monitoring costs or agency costs, detract from the value of the firm.

Monitoring costs are a function of the level of debt in the capital structure. When the amount of debt is considerably less, then the creditors may limit their monitoring activity. But if the level of debt is high, then they may insist on continuous monitoring which entails substantial costs.

SUMMARY

- At one extreme, there is traditional position which states that there exists an optimal capital structure and financial leverage does affect the value of the firm. At the other end, there is MM approach which states that financial leverage does not have any impact on the value of the firm. However, there are certain imperfections like presence of taxes, bankruptcy costs, agency costs etc., which go against the latter approach.

Chapter XII

Dividend Policy

After reading this chapter, you will be conversant with:

- The Dividend Decisions of a Firm-Relevance/Irrelevance
- Models explaining the Relevance/Irrelevance of the Dividend Policy

DIVIDEND DECISIONS

There are basically two options which a firm has while utilizing its profits after tax. Firms can either plough back the earnings by retaining them or distribute the same to the shareholders. The first option suits those firms which need funds to finance their long-term projects. However, such projects should have enough growth potential and sufficient profitability. On the other hand, the second option of declaring cash dividends from the profits after tax will lead to maximization of the shareholders wealth.

The returns to the shareholders either by way of the dividend receipts or capital gains are affected by the dividend policies of the firms. This is mainly due to the fact that the dividend policy decides the retention ratio and pay-out ratio (dividend as a percent of profits). Furthermore, the dividend policy of the firm gains importance especially due to unambiguous relationship that exists between the dividend policy and the equity returns. Thus, a firm's decision should meet the investors' expectations.

A few models which studied this relationship and the dividend policies of firms are given below and discussed:

- Traditional Position
- Walter Model
- Gordon Model
- Miller & Modigliani Position
- Rational Expectations Model.

Traditional Position

The traditional approach to the dividend policy, which was given by B Graham and D L Dodd lays a clear emphasis on the relationship between the dividends and the stock market. According to this approach, the stock value responds positively to higher dividends and negatively when there are low dividends.

The following expression, given by traditional approach, establishes the relationship between market price and dividends using a multiplier:

$$P = m (D + E/3) \quad .....(1)$$

where,

P	=	Market Price
m	=	Multiplier
D	=	Dividend per share
E	=	Earnings per share

LIMITATIONS OF THE TRADITIONAL APPROACH

The traditional approach, further states that the P/E ratios are directly related to the dividend pay-out ratios i.e., a high dividend pay-out ratio will increase the P/E ratio and vice-versa. However, this may not be true in all situations. A firm's share price may rise even in case of a low pay-out ratio if its earnings are increasing. Here the capital gains for the investor will be higher than the cash dividends. Similarly for a firm having a high dividend pay-out ratio with a slow growth rate there will be a negative impact on the market price (because of lower earnings). In addition to this there may be a few investors of the company who would prefer the dividends to the uncertain capital gains and a few who would prefer lower taxed capital gains. These conflicting factors that have not been properly explained from the major shortcomings of the dividend policy given by the traditional approach.

Walter Model

Similar to the traditional approach, the dividend policy given by James E Walter also considers that dividends are relevant and they do affect the share price. In this model he studied the relationship between the internal rate of return (r) and the cost of capital of the firm (k), to give a dividend policy that maximizes the shareholders' wealth.

The model studies the relevance of the dividend policy in three situations: (i) $r > k_e$ (ii) $r < k_e$ (iii) $r = k_e$. According to the Walter Model, when the return on investment is more than the cost of equity capital, the earnings can be retained by the firm since it has better and more profitable investment opportunities than the investors. It implies that the returns the investor gets when the company re-invests the earnings will be greater than what they earn by investing the dividend income. Firms which have their $r > k_e$ are the growth firms and the dividend policy that suits such firms is the one which has a zero pay-out ratio. This policy will enhance the value of the firm.

In the second case the return on investment is less than the cost of equity capital and in such situation the investor will have a better investment opportunity than the firm. This suggests a dividend policy of 100% pay-out. This policy of a full pay-out ratio will maximize the value of the firm.

Finally, when the firm has a rate of return that is equal to the cost of equity capital, the firms' dividend policy will not affect the value of the firm. The optimum dividend policy for such normal firms will range between zero to a 100% pay-out ratio, since the value of the firm will remain constant in all cases.

Assumptions: The relevance of the dividend policy as explained by the Walter's Model is based on a few assumptions, which are as follows:

i. Retained earnings is the only source of finance available to the firm, with no outside debt or additional equity used.
ii. r and k are assumed to be constant and thus additional investments made by the firm will not change its risk and return profiles.
iii. Firm has an infinite life.
iv. For a given value of the firm, the dividend per share and the earnings per share remain constant.

According to Walter, the market price of the share is taken as the sum of the present value of the future cash dividends and capital gains. His formula is based on the share valuation model and is arrived at in the following manner:

Step 1: Market per share price of the firm is given as

$$P = D/(k_e - g \quad \text{.....(2)}$$

Thus, we have

$$k_e = D/P + g$$

since, $g = \Delta P/P$

we have, $k_e = D/P + \Delta P/P$

but since,

$$\Delta P = \frac{r(E-D)}{k_e}$$

(since retained earnings is the only sources of finance), substituting the same, we have

$$P = \frac{D}{k_e} + \frac{r(E-D)/k_e}{k_e} \quad \text{.....(3)}$$

where

P = Market price per share
D = Dividend per share
E = Earnings per share

r = Internal rate of return
k_e = Cost of equity capital
ΔP = Change in the price
g = Growth rate of earnings

Illustration 12.1

Given the following information about ZED Ltd, show the effect of the dividend policy on the market price of its shares, using the Walter's model:

Equity capitalization rate (k_e) = 12%

Earnings per share (E) = Rs.8

Assumed return on investments (r) are as follows:

i. r = 15%

ii. r = 10%

iii. r = 12%

Solution

To show the effect of the different dividend policies on the share value of the firm for the three levels of r let us consider the dividend pay-out (D/P) ratios of zero, 25%, 50%, 75% and 100%.

i. $r > k_e$ (r = 15%, k_e = 12%)

a. D/P ratio = 0; dividend per share = zero

$$P = \frac{0 + (0.15/0.12)(8-0)}{0.12}$$

$$= \text{Rs.83}$$

b. D/P ratio = 25%; dividend per share = Rs.2.00

$$P = \frac{2 + (0.15/0.12)(8-2)}{0.12}$$

$$= \text{Rs.79}$$

c. D/P ratio = 50%; dividend per share = Rs.4

$$P = \frac{4 + (0.15/0.12)(8-4)}{0.12}$$

$$= \text{Rs.75}$$

d. D/P ratio = 75%; dividend per share = Rs.6

$$P = \frac{6 + (0.15/0.12)(8-6)}{0.12}$$

$$= \text{Rs.71}$$

e. D/P ratio = 100%; dividend per share = Rs.8

$$P = \frac{8 + (0.15/0.12)(8-8)}{0.12}$$

$$= \text{Rs.67}$$

Interpretation: From the above calculations it can be observed that when the return on investment is greater than the cost of capital, there is an inverse relation between the value of the share and the pay-out ratio. Thus, the value of ZED Ltd. is the highest when the D/P ratio is zero (P = Rs.83) and this goes on declining as the D/P ratio increases. Hence the optimum dividend policy for a growth firm is a zero dividend pay-out ratio.

ii. $r < k_e$ ($r = 10\%$, $k_e = 12\%$)

a. D/P ratio = 0; dividend per share = zero

$$P = \frac{0 + (0.10/0.12)(8-0)}{0.12}$$

$$= \text{Rs.}56$$

b. D/P ratio = 25%; dividend per share = Rs.2

$$P = \frac{2 + (0.10/0.12)(8-2)}{0.12}$$

$$= \text{Rs.}58$$

c. D/P ratio = 50%; dividend per share = Rs.4

$$P = \frac{4 + (0.10/0.12)(8-4)}{0.12}$$

$$= \text{Rs.}61$$

d. D/P ratio = 75%; dividend per share = Rs.6

$$P = \frac{6 + (0.10/0.12)(8-6)}{0.12}$$

$$= \text{Rs.}64$$

e. D/P ratio = 100%; dividend per share = Rs.8

$$P = \frac{8 + (0.10/0.12)(8-8)}{0.12}$$

$$= \text{Rs.}67$$

Interpretation: When the return on investment is less than the cost of equity capital, calculations reveal that the firm's value will enhance as the D/P ratio 1increases. Due to this positive correlation between the share price and the dividend pay-out ratio, firms which have their returns on investment less than the cost of equity capital should prefer a higher dividend pay-out ratio in order to maximize the share value.

iii. $r = k_e$ ($r = 12\%$; $k_e = 12\%$)

a. D/P ratio = 0; dividend per share = zero

$$P = \frac{0 + (0.12/0.12)(8-0)}{0.12}$$

$$= \text{Rs.}67$$

b. D/P ratio = 25%; dividend per share = Rs.2

$$P = \frac{2 + (0.10/0.12)(8-2)}{0.12}$$

$$= \text{Rs.}67$$

c. D/P ratio = 50%; dividend per share = Rs.4

$$P = \frac{4 + (0.10/0.12)(8-4)}{0.12}$$

$$= \text{Rs.}67$$

d. D/P ratio = 75%; dividend per share = Rs.6

$$P = \frac{6 + (0.10/0.12)(8-6)}{0.12}$$

$$= \text{Rs.}67$$

e. D/P ratio = 100%; dividend per share = Rs.8

$$P = \frac{8 + (0.10/0.12)(8-8)}{0.12}$$

$$= \text{Rs.67}$$

Interpretation: In the final case where the firm has its' return on investment equal to the cost of equity capital, the dividend policy does not affect the share price of the firm. The price of the firm remains Rs.67 for all the given levels of the D/P ratio. However, in actual practice r and k will not be the same and it can only be a hypothetical case. Excepting the hypothetical cases of $r = k_e$ in other cases where $r < k_e$ or $r > k_e$, according to Walter model, the dividend policy of a firm, as shown above is relevant for maximizing the share price of the firm.

LIMITATIONS OF THE WALTER'S MODEL

Most of the limitations for this model arise due to the assumptions made. The first assumption of exclusive financing by retained earnings make the model suitable only for all-equity firms. Secondly, Walter assumes the return on investments to be constant. This again will not be true for firms making high investments. Finally, Walter's model on dividend policy ignores the business risk of the firm which has a direct impact on the value of the firm. Thus, k cannot be assumed to be constant.

Gordon's Dividend Capitalization Model

Yet another model that has given importance to the dividend policy of the firm is the Gordon Model. Myron Gordon used the dividend capitalization approach to study the effect of the firms' dividend policy on the stock price.

Assumptions: The following are the assumptions based on which Gordon based the dividend policy model for firms.

i. The firm will be an all-equity firm with the new investment proposals being financed solely by the retained earnings.
ii. Return on investment (r) and the cost of equity capital (k_e) remain constant.
iii. Firm has an infinite life
iv. The retention ratio remains constant and hence the growth rate also is constant (g = br).
v. k > br i.e. cost of equity capital is greater than the growth rate.

Gordon's Model assumes that the investors are rational and risk-averse. They prefer certain returns to uncertain returns and thus put a premium to the certain returns and discount the uncertain returns. Thus, investors would prefer current dividends and avoid risk. Retained earnings involve risk and so the investor discounts the future dividends. This risk will also affect the stock value of the firm.

Gordon explains this preference for current income by the bird-in-hand argument. Since a bird-in-hand is worth two in the bush, the investors would prefer the income that they earn currently to that income in future which may or may not be available. Thus, investors would prefer to pay a higher price for the stocks which earn them current dividend income and would discount those stocks which either postpone/ reduce the current income. The discounting will differ depending on the retention rate (percentage of retained earnings) and the time.

Gordon's dividend capitalization model gave the value of the stock as:

$$P = \frac{E(1-b)}{k_e - br} \quad \text{.....(4)}$$

where,

P	=	Share price
E	=	Earnings per share
b	=	Retention ratio
(1 – b)	=	Dividend pay-out ratio
k_e	=	Cost of equity capital (or cost of capital of the firm)
br	=	Growth rate (g) in the rate of return on investment

Illustration 12.2

If k_e = 11%, and E = Rs.15 calculate the stock value of Swan Ltd. for (i) r = 12% (ii) r = 11% (iii) r = 10% for the various levels of the D/P ratios.

	D/P Ratio (1 – b)	Retention Ratio
a.	10%	90%
b.	20%	80%
c.	30%	70%
d.	40%	60%
e.	50%	50%

Solution

i. $r > k_e$ ($r = 12\%$, $k_e = 11\%$)

a. D/P ratio = 10%

b = 90%

g = br = 0.90 x 0.12 = 0.108

$$P = \frac{E(1-b)}{k_e - b_r}$$

$$= \frac{15(1-0.9)}{0.11 - 0.108}$$

= Rs.750

b. D/P ratio = 20%

= 80%

b = br = 0.80 x 0.12 = 0.096

$$P = \frac{15(1-0.8)}{0.11 - 0.096}$$

= Rs.214.28

c. D/P ratio = 30%

b = 70%

g = br = 0.70 x 0.12 = 0.084

$$P = \frac{15(1-0.7)}{0.11 - 0.084}$$

= Rs.173.08

d. D/P ratio = 40%

b = 60%

g = br = 0.60 x 0.12 = 0.072

$$P = \frac{15(1-0.6)}{0.11 - 0.072}$$

= Rs.158

e. D/P ratio = 50%

b = 50%

g = br = 0.50 x 0.12 = 0.06

$$P = \frac{15(1-0.5)}{0.11 - 0.06}$$

= Rs.150

ii. $r = k_e$ ($r = 11\%$, $k_e =$ 11%)

a. D/P ratio = 10%
b = 90%
g = br = 0.90 x 0.11 = 0.099
P = $\frac{15(1-0.9)}{0.11-0.099}$
= Rs.136.36

b. D/P ratio = 20%
b = 80%
g = br = 0.80 x 0.11 = 0.088
P = $\frac{15(1-0.8)}{0.11-0.088}$
= Rs.136.36

c. D/P ratio = 30%
b = 70%
g = br = 0.70 x 0.11 = 0.077
P = $\frac{15(1-0.7)}{0.11-0.077}$
= Rs.136.36

d. D/P ratio = 40%
b = 60%
g = br = 0.060 x 0.11 = 0.066
P = $\frac{15(1-0.6)}{0.11-0.066}$
= Rs.136.36

e. D/P ratio = 50%
b = 50%
g = br = 0.50 x 0.11 = 0.055
P = $\frac{15(1-0.5)}{0.11-0.055}$
= Rs.136.36

iii. $r < k_e$ ($r = 10\%$, $k_e = 11\%$)

a. D/P ratio = 10%
b = 90%
g = br = 0.90 x 0.10 = 0.09
P = $\frac{15(1-0.9)}{0.11-0.09}$
= Rs.75

b. D/P ratio = 20%
b = 80%
g = br = 0.80 x 0.10 = 0.08
P = $\frac{15(1-0.8)}{0.11-0.08}$
= Rs.100

c. D/P ratio = 30%

b = 70%

g = br = 0.70 x 0.10 = 0.07

$$P = \frac{15(1-0.7)}{0.11-0.07}$$

= Rs.112.5

d. D/P ratio = 40%

b = 60%

g = br = 0.60 x 0.10 = 0.06

$$P = \frac{15(1-0.6)}{0.11-0.06}$$

= Rs.120

e. D/P ratio = 50%

b = 50%

g = br = 0.50 x 0.10 = 0.05

$$P = \frac{15(1-0.5)}{0.11-0.05}$$

= Rs.125

The above illustration explains the relevance of dividends as given by the Gordon's Model. In the given three situations, the firm's share value is positively correlated with the pay-out ratio when $r_e < k_e$ and decreases with an increase in the pay-out ratio when $r > k_e$. Thus, firms with a rate of return greater than the cost of capital should have a higher retention ratio and those firms which have a rate of return less than the cost of capital should have a lower retention ratio. The dividend policy of firms which have a rate of return equal to the cost of capital will, however, not have any impact on its share value.

Miller and Modigliani Model

Miller and Modigliani have propounded the MM hypothesis to explain the irrelevance of a firms' dividend policy. This model which was based on a few assumptions, sidelined the importance of the dividend policy and its effect thereof on the share price of the firm. According to the model, it is only the firms' investment policy that will have an impact on the share value of the firm and hence should be given more importance.

Critical Assumptions: Before discussing the details of the model let us first look into the assumptions upon which the model is based:

- The first assumption is the existence of a perfect market in which all investors are rational. In perfect market condition there is easy access to information and the floatation and the transaction costs do not exist. The securities are infinitely divisible and hence no single investor is large enough to influence the share value.
- Secondly, it is assumed that there are no taxes, implying that there is no differential tax rates for the dividend income and the capital gains.
- The third assumption is a constant investment policy of the firm, which will not change the risk complexion nor the rate of return even in cases where the investments are funded by the retained earnings.
- Finally, it was also assumed that the investors are able to forecast the future earnings, the dividends and the share value of the firm with certainty. This assumption was however, dropped out of the model.

Based on these assumptions and using the process of arbitrage Miller and Modigliani have explained the irrelevance of the dividend policy. The process of arbitrage balances or completely offsets two transactions which are entered into simultaneously. Arbitrage can be applied to the investment function of the firm. As mentioned earlier, firms have two options for utilizing its after tax profits (i) to retain the earnings and plough back for investment purposes (ii) distribute the earnings as cash dividends. If the firm selects the second option and declares dividend, then it will have to raise capital for financing its investment decisions by selling new shares. Here, the arbitrage process will neutralize the increase in the share value due to the cash dividends by the issue of additional shares. This makes the investor indifferent to the dividend earnings and the capital gains since the share value of the firm depends more on the future earnings of the firm, than on its dividend policy. Thus, if there are two firms having similar risk and return profiles the market value of their shares will be similar in spite of different pay-out ratios.

Symbolically the model is given as:

In the first step the market price of the share is equal to the sum of the present values of the dividend paid and the market price at the end of the period.

$$P_0 = \frac{1}{(1+k_e)} (D_1 + P_1) \quad \text{.....(5)}$$

where,

P_0 = Current market price of the share (t = 0)

P_1 = Market price of the share at the end of the period (t = 1)

D_1 = Dividends to be paid at the end of the period (t = 1)

k_e = Cost of equity capital

With no external financing the total value of the firm will be as follows:

$$nP_0 = \frac{1}{(1+k_e)} (nD_1 + nP_1) \quad \text{.....(6)}$$

where,

n = No. of shares outstanding

Now, if the firm finances its investment decisions by raising additional capital issuing n_1 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, (6) remains as it is. Thus we have,

$$nP_0 = \frac{1}{(1+k_e)} (nD_1 + (n + n_1)P_1 - n_1P_1) \quad \text{.....(7)}$$

Firms will have to raise additional capital to fund their investment requirements, if its investment requirement is more than its retained earnings, additional equity capital (n_1P_1) after utilizing its retained earnings is as follows:

$$n_1P_1 = I - (E - nD_1) \quad \text{.....(8)}$$

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,

$$n_1P_1 = I - E + nD_1 \quad \text{.....(9)}$$

Substitute this value of the new shares in equation (7) to get,

$$nP_0 = \frac{1}{(1+k_e)}\left[(nD_1 + (n+n_1)P_1 - I + E - nD_1)\right]$$

$$= \frac{nD_1 + (n+n_1)P_1 - I + E - nD_1}{(1+k_e)}$$

$$\Rightarrow nP_0 = \frac{(n+n_1)P_1 - I + E}{(1+k_e)} \quad \text{.....(10)}$$

Thus, according to the MM model, the market value of the share is not affected by the dividend policy and this is explicitly shown in equation (10) (dividend does not figure in the equation used to calculate the share price).

Illustration 12.3

The capitalization rate of A1 Ltd. is 12%. This company has outstanding shares to the extent of 25,000 shares selling at the rate of Rs.100 each. Anticipating a net income of Rs.3,50,000 for the current financial year, A1 Ltd. plans to declare a dividend of Rs.3 per share. The company also has a new project the investment requirement for which is Rs.5,00,000. Show that under the MM model, the dividend payment does not affect the value of the firm.

To prove that the MM model holds good, we have to show that the value of the firm remains the same whether the dividends are paid or not.

i. The value of the firm, when dividends are paid:

Step 1: Price per share at the end of year 1

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1)$$

$$100 = \frac{1}{(1.12)}(3 + P_1)$$

$$P_1 = \text{Rs.}109$$

Step 2: Amount to be raised by the issue of new shares

$$n_1P_1 = I - (E - nD_1)$$

$$= 5{,}00{,}000 - (3{,}50{,}000 - 75{,}000)$$

$$= \text{Rs.}2{,}25{,}000$$

Step 3: Number of additional shares to be issued

$$n_1 = \frac{2{,}25{,}000}{109} \text{ shares}$$

Step 4: Value of the firm

$$nP_0 = \frac{(n+n_1)P_1 - I + E}{(1+k_e)}$$

$$= \frac{(25{,}000 + 2{,}25{,}000/109)\,109 - (5{,}00{,}000 - 3{,}50{,}000)}{1.12}$$

Value of the firm, nP_0 = Rs.25,00,000

ii. Value of the firm when dividends are not paid.

Step 1: Price per share at the end of the year 1

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1)$$

$$100 = P_1/1.12$$

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

Step 2: Amount to be raised from the issue of new shares

n_1P_1 = (5,00,000 – 3,50,000) = Rs.1,50,000

Step 3: Number of new shares to be issued

n_1 = 1,50,000/112 shares

Step 4: Value of the firm

$$nP_0 = \frac{(n + n_1)P_1 - I + E}{(1 + k_e)}$$

$$= \frac{(25,000 + 1,50,000/112)\,112 - (5,00,000 - 3,50,000)}{1.12}$$

Value of the firm, nP_0 = Rs.25,00,000

Thus, the value of the firm, in both the cases remains the same.

Critical Analysis of the Assumptions

The MM approach to the irrelevance of dividends has been based on a few assumptions which need to be evaluated critically especially since a perfect market and absence of floatation costs and transaction costs are situations which do not happen in reality. Few assumptions have been critically viewed below:

TAX EFFECT

This assumption cannot be true, since in the real world the tax rate for the dividend income is higher than the tax rate applicable to the capital gains.

FLOATATION COSTS

The proceeds which the firm gets from the issue of securities will be net off the issue expenses. The total issue expenses which include the underwriting expenses, brokerage, other marketing costs will be around 10-15% of the total issue (in India). With the costs of mobilizing capital from the primary market being high, these costs cannot be ignored.

TRANSACTION COSTS

This is an unrealistic assumption, since investors do have to incur certain transaction costs like the brokerage expenses while they dispose off their shares. Thus, if the investors are to equate the capital gains to the dividend income, they should sell off the shares at a higher price. In addition to this, the inconvenience and the uncertainty involved in the share price movements make the investors prefer current income by way of dividends to plough back profits.

MARKET CONDITIONS

Sometimes the 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, the firms will have to depend on the retained earnings and have a low dividend pay-out ratio. In still other cases, there may be certain sub-standard investment opportunities in which the firm will invest just because there is an easy access to funds from the market.

UNDERPRICING OF SHARES

If the company has to raise funds from the market, it will have to sell the shares to the new shareholders at a price that is less than the prevailing market price. Thus, with the shares being underpriced the firm will have to sell more shares to replace the dividend amount.

These criticisms and the preference for current income, uncertain market conditions, presence of transaction and floatation costs, underpricing etc. highlight the shortcomings of the Miller & Modigliani's dividend irrelevance policy. Thus, the dividend policy of a company does have an effect on its share value.

RATIONAL EXPECTATIONS MODEL

According to the rational expectations model, there would be no impact of the dividend declaration on the market price of the share as long as it is at the expected rate. However, it may show some adjustments in case the dividends declared are higher or lower than the expected level. For instance, when a firm declares dividends higher than what was expected, it would result in an upward movement of the share price as there would be expectations of higher earnings and similarly low dividends would be taken as a fall in future earnings. Thus, the rational expectations model suggests that alterations in the market price will not be necessary where the dividends meet the expectations and only in case of unexpected dividends will there be a change in the market price as stated above.

SUMMARY

- There are two different schools of thought on the dividend policies of a firm. According to one school of thought in a perfect market situation investment and financing decisions are independent and thus, the dividend decisions become irrelevant. The model given by Miller & Modigliani belongs to this school of thought. They also consider that the share value of the firm is based on the investment opportunities of the firm. However, the imperfect market conditions and the uncertainty prevailing in the future earnings do not provide enough support to this model. The second school of thought explains the relevance of the dividend policy and the impact of the same on the share value. However, in spite of these dividend models, it should be noted that investors are risk-averse and prefer current dividend to future earnings. Further, with maximization of shareholder wealth being the most important issue, the dividend policies of a firm will vary, depending on the operational environment.

Chapter XIII

Working Capital Management

After reading this chapter, you will be conversant with:

- Introduction to Working Capital Management
- Components of Current Assets and Current Liabilities
- Objective of Working Capital Management
- Static and Dynamic view of Working Capital
- Factors Affecting Composition of Working Capital
- Interdependence among Components of Working Capital
- Criteria for Evaluation of Working Capital Management
- Important Working Capital Ratios

SECTION 1

INTRODUCTION TO WORKING CAPITAL MANAGEMENT

Assets and liabilities of a company can be classified on the basis of duration into:

Assets – Fixed Assets and Current Assets

Liabilities – Long-term liabilities and short-term or current liabilities.

Assets are nothing but possessions owned by the firm which are capable of being expressed in monetary terms, whether tangible (like land, building, stock, etc.,) or intangible (goodwill, patents, copyrights, etc). These are used by the company for generating future benefits. Fixed assets are those assets which are permanent in nature and are held for use in business activities and not for sale. Examples of fixed assets are land, building, machinery, long-term investment, etc. Current assets, on the other hand, are those liquid assets of the company which are either held in the form of cash or can be easily converted into cash within one accounting period, usually a year. Examples of current assets are cash, short-term investments, sundry debtors or accounts receivable, stock, loans and advances, etc.

Liabilities are economic obligations of the company to pay cash or provide goods or services to outsiders including shareholders. Liabilities may be long-term or current. Long-term liabilities are those which are repayable over a period greater than the accounting period like share capital, debentures, long-term loans etc. Current liabilities on the other hand have to be paid within the accounting period like sundry creditors or accounts payable, bills payable, outstanding expenses, short-term loans, etc.

The management of fixed assets and current assets differs in three important ways -

- In managing fixed assets, the time factor is very important. That is why discounting and compounding play a very important role in any capital budgeting decision. But because the time frame of current assets is only one accounting period, the time value of money is less significant in the management of current assets.
- The liquidity position of a firm is dependent on the investment in current assets, the more, the better, whereas the role of fixed assets as far as liquidity is concerned is negligible.
- Any short run, immediate need of the company whether that be need for cash or adjustments to fluctuations in sales can be made only through adjusting the levels of the various components of the current assets. This calls for efficient management of current assets which forms part of management of working capital.

COMPONENTS OF CURRENT ASSETS AND CURRENT LIABILITIES

Working capital management involves not only managing the different components of current assets, but also managing the current liabilities, or to be more precise, the financing aspect of current assets. It is, therefore appropriate to provide a brief description of current assets and current liabilities. To provide an insight into the practices followed in the Indian corporate sector we shall make the presentation in the context of XYZ Ltd., taken from the company's balance sheet, the practices followed are presented in Table 13.1.

Table 13.1

XYZ Co. Ltd.

Composition of Current Assets and Current Liabilities
Current Assets, Loans and Advances

			Rupees in lakh
A.	**INVENTORIES**		
1.	Stores and Spare Parts		37.63
2.	Loose Tools		13.37
3.	Stock of machines, including own manufactured	1952.11	
4.	Goods in Transit	550.20	
			2502.31
5.	Raw Materials		411.91
6.	Work-in-process		567.61
7.	Value of incomplete job contracts carried forward		2133.03
Note:			5665.86
1.	Inventories are as valued and certified by the Management [See Note a for mode of valuation]		
			Rupees in lakh
B.	**SUNDRY DEBTORS**		
1.	Debts outstanding for a period exceeding six months		
	Unsecured-Good		1173.43
	Unsecured-Doubtful		17.93
			1191.36
	Less: Provision for doubtful debts		17.93
			1173.43
2.	Other debts (Unsecured-Good)		4069.35
			5242.78
			Rupees in lakh
C.	**CASH AND BANK BALANCES**		
1.	Cash and Cheques on hand and at collection centers including remittances in transit Rs.40.40 lakh		501.13
2.	Balance with Scheduled Banks:		
	In Current Account	9.09	
	In Fixed Deposits (Receipts endorsed favoring customers as security)	1.49	
	In Guarantee/L/C/Margin Account	23.73	34.31
3.	Balances with Non-Scheduled Banks in Current Account with:		
	a. Bank of Ceylon	0.21	
	b. In Investioni Bank (Czechoslovakia)	1.85	2.06
			537.50
* Includes Rs.0.54 lakh (Rs. 0.54 lakh) with a Bank in liquidation			

		Rupees in lakh
D.	**LOANS AND ADVANCES**	
1.	Bills Receivable-Guaranteed by Scheduled Banks	30.97
2.	Loans including secured Rs.4.48 lakh (Rs. 5.01 lakh)	28.83
3.	Advances & loans to Subsidiary (See Note 9)	308.46
4.	Advances recoverable in cash or in kind or for value to be received	
	Considered Good	1229.94
	Considered Doubtful	0.18
		1230.12
	Less: Provision for doubtful advances	0.18
		1229.94
5.	Balances with Excise, Customs and Port Trust	23.83
6.	Taxes paid in advance and deducted at source (after adjusting provision for taxation Rs.114.87 lakh)	183.93
		1805.96
E.	**OTHER CURRENT ASSETS**	313.48
	Total of A + B + C + D + E	13,565.58

Current Liabilities and Provisions

		Rupees in lakh
A.	**CURRENT LIABILITIES**	
1.	Acceptances:	1435.15
2.	Sundry Creditors (including premium on Redemption of Debentures Rs.25.54 lakh)	3906.76
3.	Advances and Deposits from Customers	2688.35
4.	Other Liabilities	437.40
5.	Unclaimed Dividends	7.50
6.	Application Money Refundable	5.21
7.	Interest accrued but not due on loans	105.67
8.	Hire Purchase Dues	42.23
9.	Temporary Bank Overdraft as per books of account	15.81
		8644.08
B.	**PROVISIONS**	
1.	Provision for Taxation (for Wealth Tax)	0.16
2.	Proposed Dividend	42.44
		42.60
C.	**SECURED LOANS**	
	From Banks for working capital	2959.40
D.	**UNSECURED LOANS**	
1.	Fixed Deposits	40.88
2.	Short-term loans and advances	600.00
3.	Other term loans and advances	363.00
		1003.88
	TOTAL (A + B + C + D)	12649.96

Note: Valuation of Inventories

a. Stores and spare parts, loose tools, goods-in-transit, raw materials and work-in-process are valued at cost.

b. The finished goods including those manufactured by the company are valued at cost or estimated market value, whichever is lower.

c. Incomplete job contracts are valued at the direct cost incurred on such contracts.

Current Assets

1. When the Balance Sheet is presented in the form of a 'T', the right hand side will present the current assets, loans and advances of the company. The first item of current assets is inventories whose value is certified by the management in accordance with the principle of conservatism which says that inventories are to be valued at cost or market price whichever is lower. Item (1) in inventories denotes the value of stores and spare parts which amounted to Rs.37.63 lakh at the end of the accounting period. When spare parts for machinery used are not readily available, they are acquired at the time of purchase and held in stock. In the case of imported plant & machinery, the supplier also sells spare parts which may be lying in stock. Some of the stores and spares will be consumed during the year when the machinery is being operated. However, when a better machine comes into the market, existing machinery may have to be replaced for increased operational efficiency. At that time, spares of the old machine will fetch very little in the market. A thorough analysis of spares in terms of Vital, Essential and Desirable (VED) categories is warranted when they comprise a reasonably large chunk of current assets. The company started with an opening inventory of stores and spares of Rs.39.52 lakh. Stores to the extent of Rs.160.43 lakh were consumed during the year as revealed by the annual reports of the company.

2. Item (2) shows loose tools used by the company for the manufacture and repair of the various machines and equipment, which stood at Rs.13.37 lakh at the end of the year. The opening balance was Rs.14.89 lakh and purchases of loose tools amounted to Rs.43.49 lakh, indicating that loose tools worth Rs.45.01 lakh were consumed during the year. (consumption = opening stock plus purchases less closing stock.)

3. The company is in the business of manufacturing various items of machinery and machine tools like industrial equipment, pollution control equipment, air-conditioning and refrigeration systems, textile machinery, etc. As such, the machines manufactured by the company for the purposes of sale will be included under inventories and not under fixed assets. The set of machines used for making these machineries meant for sale will come under fixed assets as these will be used by the company year after year for the manufacture of its goods (machineries for sale). Item (3) indicates the closing stock of the finished goods of the company including goods (machinery) in transit. This amounts to Rs.2,502.31 lakh. The company had an opening stock of finished goods of Rs.1,728.02 lakh. These are also conservatively valued by the company at cost or market value whichever is lower.

4. Item (5) denotes raw materials. The company started with an opening balance of raw materials of Rs.359.14 lakh. The company purchased raw materials worth Rs.1,835.23 lakh during the year, making Rs.2,194.37 lakh available for consumption. Actual consumption was to the tune of Rs.1,782.46 lakh, leaving a closing balance of Rs.411.91 lakh.

5. Work-in process, also called stock-in process indicates partially finished goods which have been valued at the end of the year at Rs.567.61 lakh. Since it takes some time for the raw materials and components that enter the production process to become finished goods, at any point of time, there will always be some partly finished goods besides goods that are finished and

ready for sale shown in item (3). Item (6) shows the value of such work-in process which have been valued at cost.

6. The company undertakes job works on contract basis like project engineering. Job contracts which are incomplete at the end of the accounting period, and which are to be carried forward to the next accounting period. Such items will also be shown under inventories. This is shown in item (7) and such incomplete jobs have been valued at Rs.2,133.03 lakh.

7. Item (B) represents sundry debtors or accounts receivable and is more liquid than inventories as it arises consequent upon the sale of finished goods on a credit basis. In accordance with the provisions of Company Law, debtors are to be categorized into 2 groups – one group outstanding for a period exceeding 6 months and the other below 6 months. For the company, debtors outstanding for a period exceeding 6 months amount to Rs.1,191.36 lakh, of which Rs.17.93 lakh are considered doubtful for which a provision has to be made, and this leaves the net amount at Rs.1,173.43 lakh. The second group amounts to Rs.4,069.35 lakh, making total sundry debtors Rs.5,242.78 lakh.

8. Item (C) indicates the most liquid form of all current assets, viz., cash and bank balances. While these assets provide immediate liquidity, they do not generate any returns unless they are invested in some other form. Consequently only a reasonably small percentage is held in this form, the influencing or determining factors being the degree of synchronization of cash inflows and outflows, the degree of uncertainty surrounding them and the ability of the firm to raise liquid cash at short notice. For the Company the amount of cash and bank balance is only 3.96% of total current assets whereas inventory accounts for 41.8% of total current assets.

9. Item (D) consists of loans and advances which include bills receivables, advances and loans to subsidiaries of the company, balances with Excise, Customs and Port Trust, advance payments of tax, etc., after deducting provision for taxation and providing for doubtful advances. The net amount under this head for the company amounts to Rs.1,805.96 lakh. Item (E) represents other current assets like interest accrued on investments, prepaid expenses etc., which amount to Rs.313.48 lakh.

Current Liabilities

These are shown on the left hand side of a 'T' shaped Balance Sheet and are grouped under 4 heads. As per the provisions of the Companies Act, Items (C) and (D) of Table 13.1 will not be shown as part of current liabilities but will be shown separately along with other long-term secured and unsecured loans. However, as the liabilities have been utilized for financing the current assets of the company, they have been included here to give a complete picture.

1. Item (A) represents current liabilities, the major chunk of which is contributed by sundry creditors or accounts payable, followed by advances and deposits from customers which have to be returned. Refund of application money on non-allotment, interest accrued but not due, hire purchase dues, unclaimed dividends, temporary bank over draft (OD) and other outstanding expenses also come under this head, creating a total of Rs.8,664.08 lakh.

2. Item (B) includes provisions which like current liabilities also call for short-term payments by the company, but the exact figure of which is not known beforehand. The company has provided Rs.0.16 lakh for taxes and Rs.42.44 lakh for dividend, totalling to Rs.42.60 lakh.

3. As per the requirements of Company Law, the arrangements made with banks for working capital towards the financing part of the current assets by providing security in the form of hypothecation of stocks or pledge on sundry debtors are shown separately under the head secured loans along with term

loans from financial institutions secured by mortgaging fixed assets or bank guarantees. But since bank loans for working capital are strictly of short-term nature and used for financing the current assets of the company, these should also be shown along with current liabilities and provisions. Item (C) shows that the company has availed itself Rs.2,959.40 lakh as secured loan for working capital from commercial banks.

4. Strictly speaking, fixed deposits repayable within one year should also form part of current liabilities. However, since fixed deposits are mainly raised to meet the financial requirement of current assets, it may not be a bad idea to consider the total amount of fixed assets as part of current liabilities. However in Table 13.1, Item (D) Fixed Deposits and other short-term loans includes only those repayable within one year by the company. They amount to Rs.1,003.88 lakh.

OBJECTIVE OF WORKING CAPITAL MANAGEMENT

Liquidity vs. Profitability

The basic objective of working capital is to provide adequate support for the smooth functioning of the normal business operations of a company. The question then arises as to the determination of the quantum of investment in working capital that can be regarded as 'adequate'. Once we recognize the fact that a company has to operate in an environment permeated with uncertainty/risk, the term 'adequate working capital' becomes somewhat subjective depending upon the attitude of the management towards uncertainty/risk. Therefore the quantum of investment in current assets has to be made in a manner that it not only meets the needs of the forecasted sales but also provides a built-in cushion in the form of safety stocks to meet unforeseen contingencies arising out of factors such as delays in arrival of raw materials, sudden spurts in sales demand etc. Consequently, the investment in current assets for a given level of forecasted sales will be higher if the management follows a conservative attitude than when it follows an aggressive attitude. Thus a company following a conservative approach is subjected to a lower degree of risk than the one following an aggressive approach. Further, in the former situation the high amount of investment in current assets imparts greater liquidity to the company than under the latter situation wherein the quantum of investment in current assets is less. This aspect considers exclusively the liquidity dimension of working capital. There is another dimension to the issue, *viz.*, the 'profitability' and it is discussed below.

Once we recognize the fact that the total amount of financial resources at the disposal of a company is limited and these resources can be put to alternative uses, the larger the amount of investment in current assets, the smaller will be the amount available for investment in other profitable avenues at hand with the company. A conservative attitude in respect of investment in current assets leaves less amount for other investments than an aggressive approach does. Further, since current assets will be more for a given level of sales forecast under the conservative approach, the turnover of current assets (calculated as the ratio of net sales to current assets) will be less than what they would be under the aggressive approach. This being so, even if we assume the same level of sales revenue, operating profit before interest and tax and net (operating) fixed assets, the company following a conservative policy will have a low percentage of operating profitability compared to its counterpart following an aggressive approach as can be seen from the numerical illustration 13.1.

Illustration 13.1

S.No.	Particulars	Conservative Policy	Aggressive Policy
1.	Net Sales	Rs.50 lakh	Rs.50 lakh
2.	Operating Profit Before Interest and Tax	Rs.5 lakh	Rs.5 lakh
3.	Net (Operating) Fixed Assets	Rs.10 lakh	Rs.10 lakh
4.	Current Assets	Rs.8 lakh	Rs.5 lakh
5.	Total Operating Assets [= (3) + (4)]	Rs.18 lakh	Rs.15 lakh
6.	Net Operating Profit Margin $\left[=\frac{(2)}{(1)}\right]$	$\frac{5}{50}=10\%$	$\frac{5}{50}=10\%$
7.	Turnover of Net Operating Fixed Assets $\left[=\frac{(1)}{(3)}\right]$	$\frac{50}{10}=5$ times	$\frac{50}{10}=5$ times
8.	Turnover of Current Assets $\left[=\frac{(1)}{(4)}\right]$	$\frac{50}{8}=6.25$ times	$\frac{50}{5}=10$ times
9.	Turnover of Total Operating Assets $\left[=\frac{(1)}{(5)}\right]$	$\frac{50}{18}=2.78$ times	$\frac{50}{15}=3.33$ times
10.	Rate of Return on Total Operating Assets [= (6) x (9), (2) x 100 (5)]	27.8%	33.3%
11.	Ratio of Current Assets to Net Operating Fixed Assets $\left[=\frac{(4)}{(3)}\right]$	$\frac{8}{10}=0.8$	$\frac{5}{10}=0.5$
		= 80%	= 50%

From the illustration, it can be easily seen from item (10), that the alternative of following a conservative approach to investment in current assets results in a low profitability of 27.8 percent compared to the profitability of 33.3 percent obtained under the alternative – an aggressive approach. The reason for this can be directly traced to the low turnover of current assets leading to a lower turnover of total operating assets under the conservative approach compared to that under the aggressive approach. From item (11) it can be seen that current assets comprise 80 percent of net operating fixed assets resulting in higher proportion of current assets and hence greater liquidity compared to the corresponding figure of 50 percent indicating low liquidity under the aggressive approach.

From the above discussion it is apparent that management of current assets inevitably leads to a trade-off between 'profitability' and 'liquidity'. An aggressive approach results in greater profitability but lower liquidity while a conservative approach results in lower profitability but higher liquidity. This can be resolved to a certain extent by the management by following a moderate policy which is neither highly aggressive nor highly conservative. Under this approach some liquidity and some profitability have to be sacrificed so that the resultant figures of liquidity and profitability are reasonably satisfactory to the company. For eample, in the numerical illustration given earlier, if the management decides to follow a moderate approach which leads to an investment of Rs.6.5 lakh in current assets, then the rate of return of total operating assets will become 30.30 percent $\left(=\frac{5}{16.5}\right)$ which is higher than the rate of return of 27.8 percent under the conservative approach but lower than the figure of 33.3 percent under the aggressive approach. Further, the degree of liquidity as indicated by the ratio of current assets to net operating fixed assets will now be 65 percent which is lower than the figure of 80 percent under the conservative approach but higher than the figure of 50 percent under the aggressive approach. Thus, a proper balancing between liquidity and profitability can be reached by considering alternatives along with their consequences on liquidity and profitability. Among the alternatives the one which matches the attitude of the management toward risk can be selected.

Choosing the Pattern of Financing

The objective of working capital management covers not only the management of current assets in tune with the attitude of management toward risk and arriving at a satisfactory level of current assets that balances the liquidity and profitability criteria but also the management of financing the chosen level of current assets, once again taking into consideration the attitude of management towards risk.

From the description of current assets and current liabilities discussed above, it can be observed that in the normal course of business a company will usually have access to non-interest bearing short-term liabilities such as sundry creditors, accrued expenses and other current liabilities as also provisions toward financing current assets. These are called spontaneous liabilities as they arise more or less automatically in the context of current assets. The difference between the amounts of current assets and spontaneous liabilities needs to be financed by a combination of bank borrowings in the form of cash credit/overdraft arrangement and long-term sources of finance such as debentures and equity capital. Fixed deposits obtained from the public for periods ranging from one to three years can also be used for the same purpose. Here also an aggressive financing policy will tend to have a financing mix tilted in favor of bank borrowings and public deposits compared to a conservative policy tilted more towards long-term sources like equity and to some extent debentures.

Except in rare instances, the general tendency in the case of manufacturing and trading companies is that during certain periods in an year the need for current assets will be much higher than in other periods in the year. As the financing charges in the case of bank borrowings are geared to and move in tandem with the credit needs occassioned by the higher investment in current assets, the total interest charge is likely to be low. However, debt-servicing cost will be high as bank borrowings have to be repaid (rather re-negotiated for the coming year). Consequently, the risk of 'technical insolvency' (a situation where a company is not in a position to honor its current liabilities including short-term bank borrowings which can arise even in the case of profitable companies) is likely to be high. On the other hand, a conservative policy having a high proportion of equity capital and to some extent debentures will have comparatively low debt-servicing resulting in a lower degree of the risk of technical insolvency. However, the cost of financing will be high as the cost of equity capital is the highest and it

does not provide tax benefit which the interest on borrowed capital provides to the company and debenture interest (even after reckoning with tax benefit) has to be paid throughout the year irrespective of the fluctuating credit needs of a company towards financing its current assets. Even in the case of choosing the mix of instruments for financing current assets the risk of technical insolvency tends to be high while the cost of financing tends to be low under an aggressive policy compared to a conservative policy under which the risk of technical insolvency will be low while the cost of financing tends to be high. Once again, the management's attitude toward risk will go a long way in determining the financing-mix considered appropriate to the company.

The tendency of the management to follow an aggressive mix of financial instruments towards financing current assets is severely handicapped by the restrictions imposed by the commercial banks in permitting cash credit/overdraft limits.

From the above discussion it emerges that working capital management encompasses the management of current assets and the means of financing them. The objective of working capital management is to balance the 'liquidity' and 'profitability' criteria while taking into consideration the attitude of management toward risk and the constraints imposed by the banking sector while providing short-term credit in the form of cash credit/bank overdraft.

STATIC VIEW OF WORKING CAPITAL AND ITS SHORTCOMINGS

Traditionally the term working capital is defined in two ways, *viz.*, gross working capital and net working capital. Gross working capital is equal to the total of all current assets (including 'loans and advances') of a company. Net working capital is defined as the difference between gross working capital and current liabilities (including 'provisions'). Sometimes net working capital is also referred to as 'net current assets.' Since both gross working capital and net working capital are obtained from the data contained in the balance sheet, working capital viewed in either sense denotes the position of current assets (or net current assets) as at the end of a company's accounting year. An important characteristic of current assets is conventionally considered to be their convertibility into cash within a single accounting year unlike fixed assets which provide the 'production capacity' for the manufacture of finished goods for sale. Current liabilities arise in the context of and hence are derived from current assets. Conventionally current liabilities are of short-term nature and come up for payment within a single accounting year. Consequently, a lot of emphasis is traditionally placed on the current assets (which are valued on a conservative basis in accordance with the 'conservatism principle' of accounting) vis-à-vis current liabilities. As a rule of thumb, the value of 2:1 for the ratio of current assets to current liabilities (popularly known as current ratio) is considered to be satisfactory by the short-term creditors, the underlying logic being that a company can face the unlikely situation of meeting all of its current liabilities by liquidating its current assets even at half of their recorded value without any financial embarrassment.

Limitations

The definition of working capital given above considers the purpose of current assets is to provide adequate cover for current liabilities. This definition suffers from many limitations as stated below.

First, the amount of working capital, viewed in either sense, is obtained from the data contained in the balance sheet which merely indicates the financial position of a company as on a specific date and, is therefore, 'static' in nature. Consequently 'working capital' as defined traditionally provides a snapshot picture of current assets and current liabilities as on the balance sheet date. It fails to reflect the true dynamic nature of working capital which can be captured by combining the data contained in both the balance sheet and profit and loss account of a company. The dynamic approach to working capital is far more useful from the point of view of managerial decision-making than the static approach.

Secondly, the balance sheet of a company is prepared and presented in the annual report in accordance with the Schedule VI requirements of the Indian Companies Act. As a result, the amount of net working capital obtained by subtracting current liabilities from current assets presented in the balance sheet fails to reflect the true amount of net working capital. This is so, for the following reasons:

- Bank borrowings in the form of cash credit/overdraft accounts obtained for financing current assets, which are basically short-term borrowings, are not shown as part of current liabilities but separately under the head-secured loans. Similarly, unsecured loans of short-term duration such as public deposits are also shown separately under the head-unsecured loans. To obtain a true picture of the position of net working capital the above mentioned items have to be regarded as part of current liabilities. This problem is taken care of by the Bombay Stock Exchange official directory as their classification of current liabilities includes all borrowings other than long-term borrowings.
- Current assets, as presented in the balance sheet do not include marketable securities such as treasury bills whose main motive is to improve the liquidity position of the company and are held for short periods. These are considered under the generic head 'investments' which include both trade investments and others.
- Points mentioned above tend to distort the calculation of net working capital from the simple balance sheet heads stated as current assets and current liabilities. For XYZ Company, net working capital as per the Static definition will amount to Rs.4,878.90 lakh i.e., current assets, loans and advances of Rs.13,565.58 lakh from which current liabilities and provisions of Rs.8,686.68 lakh have been deducted. But if we include bank loan for working capital of Rs.2,959.40 lakh and unsecured loans repayable within one year of Rs.1,003.88 lakh, we find that net working capital amounts to only Rs.915.62 lakh. This seems to be a more realistic amount and denotes the magnitude of long-term funds used for financing the balance amount of current assets not financed from short-term funds.
- A negative net working capital indicates the siphoning off of short-term funds for the financing of long-term or fixed assets which when continued for long can lead to problems of liquidity for an organization. This is because, the investment in fixed assets will not create liquidity in the short run and the company may face problems in meeting its short-term financial obligations. It is worth noting that the calculation of net working capital made above is more in line with what bankers follow, as it will be useful in taking managerial decisions in respect of working capital which encompasses not only the management of current assets but also the management of the 'financing' aspect of current assets.

DYNAMIC VIEW OF WORKING CAPITAL

In the light of shortcomings of the traditional view of working capital there is a need for evolving a more expressive definition that highlights the importance of working capital to a company. Working capital can be viewed as the amount of capital required for the smooth and uninterrupted functioning of the normal business operations of a company ranging from the procurement of raw materials, converting the same into finished products for sale and realizing cash along with profit from the accounts receivables that arise from the sale of finished goods on credit.

From the above definition, the need for working capital by a typical manufacturing and selling company becomes self-evident. In order to meet the production plans of a company some quantity of raw materials has to be maintained in the form of inventory as there will usually be a time lag from the moment an order is placed for raw materials with suppliers till the same is received by the company. Absence of adequate raw materials inventory may result in stoppage of production for want of raw materials.

The quantum of raw material inventory to be maintained by a company depends, *inter alia,* on the availability of raw materials in the domestic market, the need for importing raw materials in case they are not indigeneously available, the existence or otherwise of curbs by the government on imported raw materials, the lead time (the time gap between placing an order and receiving the supply of raw materials) for the procurement of raw materials, availability of bulk purchase discounts offered by suppliers and inflationary pressure on the price of raw materials. Once the raw materials are put into the production process, the company has to incur manufacturing expenses like wages and salaries, fuel and other manufacturing overheads. The nature of process technology adopted by the company is an important factor in determining the time taken for converting raw materials into finished goods. Consequently, the company may have some amount of finished goods and the balance in the form of partly-finished goods denoted by the term work-in-process. Thus, work-in-process inventory which a company carries becomes an inevitable accompanying feature of the production process.

The quantum of finished goods inventory a company carries is basically determined by the degree of accuracy in forecasting sales demand, the ability to meet sudden and unforeseen spurts in the demand for finished goods of the company, seasonality of the demand considered in conjunction with the production policy and the amenability of the product to become perishable in a relatively short period of time (as in the case of cigarettes and certain types of pharmaceuticals). The amount of finished goods inventory held by a company should normally provide its sales executives reasonable elbow-room for negotiating and clinching deals with new customers. Unless a company enjoys special advantage over its competitors, it may have to honor the practices followed by the industry to which it belongs in the sale of finished goods. By and large in a competitive market, the finished goods are sold on a credit basis. When a company gives a credit period to its customers from the date of consummation of sale, the amount of sales value will become accounts receivable or sundry debtors which get converted into cash only after the expiry of credit period.

Further, a company usually maintains at all times some amount of liquid cash either on hand or at bank towards meeting cash payments arising out of transactions as also for providing adequate cushion towards meeting unanticipated demand for cash such as, for example, availing cash discount on purchases suddenly introduced by suppliers, before the generation of cash takes place in the normal course of business. One more point needs to be considered at this stage. Just as the company extends credit to its customers, in many instances it can receive credit from its suppliers of materials. Consequently, the drain on cash resources of the company can be delayed till the expiry of credit period. Until such time the amount will become 'Accounts payable' of the company and as such provides a spontaneous source of credit. From this discussion it is evident how important a role working capital plays in supporting the normal business operations of a typical manufacturing and trading company.

FACTORS AFFECTING THE COMPOSITION OF WORKING CAPITAL

We have discussed the need for working capital along with its constituent elements in the case of a typical manufacturing and selling organization. But it is not necessary that every company should have all the constituent elements considered earlier. For example, a purely trading company which purchases finished products on credit basis and sells the same for cash will only have finished goods inventory and cash as current assets and accounts payable as current liabilities. Since there is no manufacturing involved, the investment in fixed assets will be minimal, say around 5 percent of the investment in current assets. Consequently working capital management assumes greater significance in such organizations. Now, we shall try to identify some of the significant factors affecting the composition of working capital or current assets.

Nature of Business

As mentioned above purely trading organizations will have basically finished goods inventory, accounts receivable (in some cases) and cash as current assets and accounts payable as current liabilities. Similarly travel agency firms will have predominantly accounts receivable and some amount of cash as current assets unlike manufacturing and trading companies. The investment in net (operating) fixed assets[1] will at most be around 5 percent of investment in current assets. On the other hand, capital goods manufacturing and trading companies will have a high proportion of current assets in the form of inventory of raw materials components and work-in-process. The ratio of net (operating) fixed assets to current assets will be around 100 percent or more.

Nature of Raw Material Used

The nature of major raw material used in the manufacture of finished goods will greatly influence the quantum of raw material inventory. For example, if the raw material is an agricultural product whose availability is pronouncedly seasonal in character the proportion of raw material inventory to total current assets will be quite high. For example, tobacco is the major raw material for cigarette industry whose availability is seasonal in nature and also the tobacco procured requires a reasonably long 'curing' period. Consequently, the percentage of raw material inventory to total current assets will be quite high compared to other items.

Similarly, companies using imported raw materials with long lead time tend to have a high proportion of raw material inventory. In the case of a capital goods manufacturing company the demand for whose product is growing over time the tendency will be to have high inventory of raw materials and components.

Process Technology Used

In case the raw material has to go through several stages during the process of production, the work-in-process inventory is likely to be much higher than any other item of current assets.

Nature of Finished Goods

The nature of finished goods greatly influences the amount of finished goods inventory. For example, if the finished goods have what is called a short span of 'shelf-life' as in the case of cigarettes the finished goods inventory will constitute a very low percentage of total current assets.

In the case of construction companies, which undertake work on a turnkey basis, as soon as the construction is completed the customer will take possession of it. Consequently the finished goods inventory will be virtually insignificant and the work-in-process inventory (rather work-in-process) will be considerably high.

In the case of companies the demand for whose finished goods is seasonal in character, as in the case of fans, the inventory of finished goods will constitute a high percentage of total current assets. This is mainly because from the point of view of fixed costs to be incurred by the company it would be more economical to maintain optimum level production throughout the year than stepping up production operations during busy season.

In the case of reputed companies, manufacturing consumer goods that enjoy growing demand over the years, the finished goods inventory need not be high as sales demand can be forecast with a reasonable degree of accuracy. However, in such companies the raw material inventory tends to be high in view of the large variety of products to be manufactured.

1. The term net (operating) fixed assets consists only of net fixed assets that are being used for the normal business operations of a company and will not include capital work-in-progress as the latter cannot be used for the present operations of the company.

Degree of Competition in the Market

When the degree of competition in the market for finished goods in an industry is high, then companies belonging to the industry may have to resort to an increased credit period to its customers, partially lowering credit standards and similar other practices to push their products. These practices are likely to result in a high proportion of accounts receivable.

SECTION 2

INTER DEPENDENCE AMONG COMPONENTS OF WORKING CAPITAL

Inter-dependence among the various components of working capital can be easily understood from figure 13.1 given below:

Figure 13.1: Working Capital Cycle (Operating)

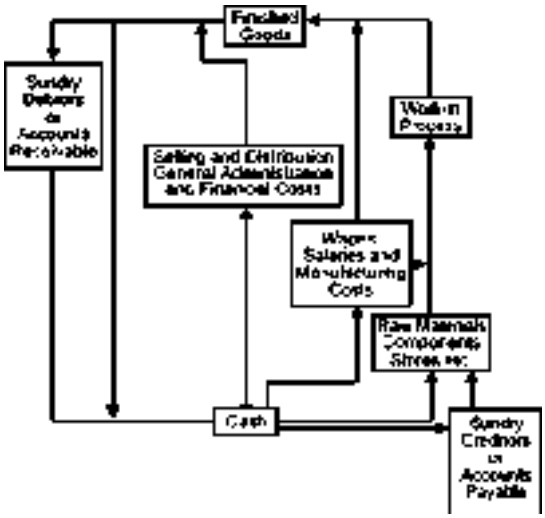


Figure 13.1 depicts the inter-dependence among the components of working capital. A company starting with cash purchases raw materials, components etc., on a cash or credit basis. These materials will be converted into finished goods after undergoing the stage of work-in-process. For this purpose the company has to make payments towards wages, salaries and other manufacturing costs. Payments to suppliers have to be made on purchase in the case of cash purchases and on the expiry of credit period in the case of credit purchases. Further, the company has to meet other operating costs such as selling and distribution costs, general, administrative costs and non-operating costs described as financial costs (interest on borrowed capital). In case the company sells its finished goods on a cash basis it will receive cash along with profit with least delay. When it sells goods on a credit basis, it will pass through one more stage, viz, accounts receivable and gets back cash along with profit on the expiry of credit period. Once again the cash will be used for the purchase of materials and/or payment to suppliers and the whole cycle termed as working capital or operating cycle repeats itself. This process indicates the dependence of each stage or component of working capital on its previous stage or component.

The dependence of one component of working capital on its previous stage/component is described above highlighting the inter-dependence among the components of working capital. However, there can be other kinds of inter-dependence which are not dictated by the usual sequence of manufacturing and selling operations. For example, in case the manufacturing process may require a raw material which is in short supply, the company may have to make advance payment in anticipation of the receipt of that raw material. This will cause immediate drain on cash resources unlike a situation where credit purchase of raw materials can be made. Similarly, if there is an excessive accumulation of finished

goods inventory the company may have to provide more liberal credit period and/or relax its existing credit standards which will increase sundry debtors. In situations of greater need for cash, even providing cash discount as part of credit-terms for sale which is likely to boost the cash resources, may have to be resorted to. In such cases, the relative benefits and costs may have to be taken into consideration before taking decisions.

Operating Cycle Approach to Working Capital Management

What has been considered in figure 13.1 above as working capital cycle is more popularly known as the operating cycle. This title is more expressive in the sense that the normal business operations of a manufacturing and trading company start with cash, go through the successive segments of the operating cycle, viz, raw material storage period, conversion period, finished goods storage period and average collection period before getting back cash along with profit. The total duration of all the segments mentioned above is known as 'gross operating cycle period'. In case the company is placed in an advantageous position of being able to sell its products for cash then the segment of average collection period will disappear from the gross operating cycle period and to that extent the total duration of the cycle gets reduced. In case advance payments are to be made for procuring materials, the operating cycle period increases. The purchase of raw materials, components etc., are usually made on a credit basis, thereby giving rise to the spontaneous current liability, viz, accounts payable. When the average payment period of the company to its suppliers is deducted from the gross operating cycle period the resultant period is called net operating cycle period or simply 'operating cycle period'. It becomes obvious that shorter the duration of operating cycle period, faster will be the transformation of current assets into cash. The operating cycle approach is quite useful both in controlling and forecasting working capital. The step by step calculation of the different segments of operating cycle is presented below.

RAW MATERIAL STORAGE PERIOD

1. Annual consumption of raw materials, components etc.
2. Average daily consumption of raw materials, components etc. assuming an year of 360 days for convenience = (1) ÷ 360
3. Average stock of raw materials, components etc.

$$\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$$

4. Raw material storage period = (3) ÷ (2) = n_1 days.

CONVERSION PERIOD

1. Annual cost of production = Opening Stock of work-in process + Consumption of raw materials etc + Other manufacturing costs such as wages and salaries, power and fuel etc. + Depreciation — Closing work-in process.
2. Average daily cost of production = (1) ÷ 360
3. Average Stock of work-in process

$$= \frac{\text{Opening W.I.P.} + \text{Closing W.I.P}}{2}$$

4. Average conversion period = (3) ÷ (2) = n_2 days.

FINISHED GOODS STORAGE PERIOD

1. Annual cost of sales = Opening stock of finished goods + Cost of production + Excise duty + Selling and distribution costs + General administrative costs + Financial costs – Closing stock of finished goods.
2. Average daily cost of sales = (1) ÷ 360

3. Average stock of finished goods

$$= \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

4. Finished goods storage period = (3) ÷ (2) = n_3 days.

AVERAGE COLLECTION PERIOD

1. Annual credit sales of the company.
2. Average daily credit sales = (1) ÷ 360
3. Average balance of sundry debtors

$$= \frac{\text{Opening balance} + \text{Closing balance}}{2}$$

4. Average collection period = (3) ÷ (2) = n_4 days

AVERAGE PAYMENT PERIOD

1. Annual credit purchases made by the company
2. Average daily credit purchases = (1) ÷ 360
3. Average balance of sundry creditors

$$= \frac{\text{Opening balance} + \text{Closing balance}}{2}$$

4. Average payment period = (3) ÷ (2) = n_5 days

From the above calculations, the gross operating cycle period is obtained as (n_1 + n_2 + n_3 + n_4) days where n_1 denotes the raw material storage period, n_2 denotes the period for conversion of raw materials into finished goods, n_3 denotes the finished goods storage period and n_4, the average collection period; each of which is expressed in days. When the average payment period of n_5 days is subtracted from the gross operating cycle period, as calculated above, the resultant figure provides the operating cycle period. When the operating cycle period is short it implies that the locking up of funds in current assets is for a relatively short duration and the company can obtain greater mileage from each rupee invested in current assets.

Illustration 13.2

The gross and net operating cycle periods for XYZ Industries Ltd. are calculated below, using the principles of calculation already developed, for the previous accounting year. The following assumptions are made for the calculation in respect of the data contained in the annual reports of the company.

- Manufacturing expenses have been selectively taken from total items given in the schedule which gives details of manufacturing, selling, distribution and administrative expenses.
- 'Wages and salaries' given under manufacturing costs are inclusive of wages and salaries to employees engaged in non-manufacturing functions also.
- 'Purchase' figures are obtained as the balancing item of the equation:
- Opening stock + Purchases – Closing stock = Consumption of 'materials', where all the items excepting purchases are obtained from the annual reports. In the absence of detailed information 'purchases' are assumed to have been made on a credit basis.
- In the absence of information in respect of categorization of sales into cash and credit components all sales are assumed to have been made on a credit basis.
- For the sake of convenience an year is assumed to have 360 days.

The data for the calculation of operating cycle are presented below:

Data for the previous year

	Particulars	Amount (Rs. in lakh)
1.	Opening Balance of	
	a. Raw Materials, Stores and Spares, etc	3454.84
	b. Work-in-Process	56.15
	c. Finished Goods	637.92
	d. Accounts Receivable	756.45
	e. Accounts Payable	2504.18
2.	Closing Balance of	
	a. Raw Materials, Stores and Spares, etc.	4095.41
	b. Work-in-Process	72.50
	c. Finished Goods	1032.74
	d. Accounts Receivable	1166.32
	e. Accounts Payable	3087.47
3.	Purchases of Raw Materials, Stores and Spares, etc.	10676.10
4.	Manufacturing Expenses	1146.76
5.	Depreciation	247.72
6.	Customs and Excise duties	35025.56
7.	Selling, Administration and Financial Expenses	4557.48
8.	Sales	54210.65

The calculations of the different segments of the operating cycle for XYZ Industries are shown below:

A. Raw Material Storage Period

1. Average stock of Raw Materials

$$= \frac{3,454.84 + 4,095.41}{2} = 3,775.13$$

2. Annual Consumption of Raw Materials

= Opening Stock + Purchases – Closing Stock

= 3,454.84 + 10,676.10 – 4,095.41

= 10,035.53

3. Average daily consumption of Raw Materials

$$= \frac{10,035.53}{360} = 27.88$$

4. Raw Material Storage Period

$$= \frac{3,775.13}{27.88} = 135 \text{ days}$$

AVERAGE CONVERSION OR WORK-IN-PROCESS PERIOD

1. Average Stock of Work-in-process

$$= \frac{56.15 + 72.50}{2} = 64.33$$

2. Annual cost of production

= Opening work-in-process
+ Consumption of materials
+ Manufacturing Expenses + Depreciation
– Closing work-in-process

= 56.15 + 10,035.53 + 1,146.76 + 247.72 – 72.50

= 11,413.66

3. Average daily cost of production

$$= \frac{11,413.66}{360} = 31.70$$

4. Average conversion period = $\frac{64.33}{31.70} = 2$ days

FINISHED GOODS STORAGE PERIOD

1. Average inventory of finished goods

$$= \frac{637.92 + 1,032.74}{2} = 835.33$$

2. Annual cost of sales

= Opening stock of finished goods
+ Cost of production
+ Selling, administration and financial expenses
+ Customs and excise duties
– Closing stock of finished goods.

= 637.92 + 11,413.66 + 4,557.48
+ 35,025.56 – 1,032.74

= 50601.88

3. Average daily cost of sales

$$= \frac{50,601.88}{360} = 140.56$$

4. Finished goods storage period

$$= \frac{835.33}{140.56} = 6 \text{ days}$$

AVERAGE COLLECTION PERIOD

1. Average book debts

$$\frac{756.45 + 1,166.32}{2} = 961.38$$

2. Annual Sales

= 54,210.65

3. Average daily Sales

$$\frac{54,210.65}{360} = 150.59$$

4. Average Collection Period

$$\frac{961.38}{150.59} = 6 \text{ days}$$

AVERAGE PAYMENT PERIOD

1. Average balance of trade creditors

$$= \frac{2,504.18 + 3,087.47}{2} = 2,795.82$$

2. Annual purchases

= 10,676.10

3. Average daily purchases

$$= \frac{10,676.10}{360} = 29.66$$

4. Average payment period

$$\frac{2,795.82}{29.66} = 94 \text{ days}$$

Operating cycle period

= 135 + 2 + 6 + 6 – 94 = 55 days

The number 135 against segment (A) can be interpreted as 135 days' worth of 'raw material consumption' is held, on the average, in the form of raw material inventory during the year. It may be noted that Raw Material storage period is the maximum compared to other segments. The greater raw material storage period has also increased the operating cycle.

The number 2 days against (B) indicates that 2 days' worth of 'cost of production' on the average is held in the form of work-in-process inventory reflecting efficiency in the management of work-in-process inventories.

The number 6 days against (C) represents 6 days' worth of cost of sales', has been held in the form of finished goods inventory on the average. Average collection period denotes that '6 days' worth of (credit) sales' are held, on an average in the form of finished goods inventory. This reflects high turnover of accounts receivable indicating efficiency in the management of receivables. XYZ has an average payment period of 94 days indicating that 94 days' worth of credit purchases' are held in the form of sundry credits. Although sundry creditors is a non-interest bearing current liability a reduction in the average payment period is likely to enhance the image of the company from its suppliers' point of view.

The end result of the calculations is reflected in the operating cycle whose duration is 55 days.

APPLICATION OF THE OPERATING CYCLE

As mentioned earlier, operating cycle approach proves quite useful as a technique for exercising control over working capital. Each segment of operating cycle can be compared with a pre-specific norm or with the corresponding figure in the previous accounting year or with the corresponding figure obtainable from the master budget of the company. Significant deviations call for closer scrutiny by the management who can seek the reasons for such occurrences. The deviations may have occurred due to a variety of reasons. For example, an increase in the average conversion period may have occurred due to shortage of an important raw material (in which case the purchase manager may be asked for an explanation), plant break-down (in which case the maintenance engineer may be asked for an explanation), a wild-cat strike by the workers (which calls for an explanation from the chief of personnel and industrial relations) etc. Once the reasons are known, remedial measures can be taken in respect of immediately controllable factors and the other factors may be accepted as constraints for the time being, pending long-term solutions. For example, frequent break-down of plant may call for replacement of certain sections and/or modernization which cannot be implemented immediately but can be implemented say in about a year. Towards the end of exercising better control, the operating cycle may be calculated on a quarterly basis and/or on a product group basis.

In the case of seasonal industries such as tea industry, two sets of operating cycles may be calculated – one for the busy season and the other for the slack season – for exercising better control. As inter-temporal comparisons for monitoring working capital efficiency for a company are likely to be affected by the inflation factor, necessary adjustments can be made by the application of appropriately chosen price-index. The comparisons made, after neutralizing the impact of inflation both on sales and working capital, are more likely to provide greater insight into the efficiency of working capital management across the years.

Another important area for the application of operating cycle approach lies in estimating the working capital requirement of a company to support the forecasted level of sales. Given the duration of various components of the operating cycle, the working capital needs can be estimated.

This may be illustrated with the help of an illustration.

Illustration 13.3

R.K. Ltd. plans to sell 1,00,000 units next year. The expected cost of goods sold is as follows:

Particulars	Unit Cost	Monthly Cost*
Raw Material Cost	Rs.50	Rs.4,00,000
Manufacturing Expenses	20	1,60,000
Selling, Administration, Financial Expenses	15	1,20,000
Total	Rs.85	Rs.6,80,000
The selling price per unit is expected to be Rs.100		

* At a monthly sales level of 8,000.

The deviations at various stages of the operating cycle are expected to be as follows:

Raw materials stage	=	3 months
Work-in-process stage	=	1 month
Finished goods stage	=	1 month
Debtors stage	=	2 months

Based on this information, investment in various current assets can be calculated.

Investment in Various Current Assets

(Rs. in thousand)

Input	Period (in months)	Raw Materials	Work-in process	Finished Goods	Debtors	Total
1. Raw Material						
In Stock	3	1,200				
In W.I.P.	1		400			
In Finished goods	1			400		
In Debtors	2				800	
						2,800
2. Manufacturing Expenses						
In W.I.P.	½@	–	80			
In Finished Goods	1			160		
In Debtors	2				320	
						560
3. Selling, Administration and Financial Expenses						
In Finished Goods	1	–	–	120		
In Debtors	2				240	
						360
4. Profit						
In Debtors	2	–	–	–	240	
						240
Total		1,200	480	680	1,600	3,960

@ Manufacturing expenses are expected to occur evenly. The work-in-process stage lasts for one month. Hence, on an average, the manufacturing expense component in work-in-process value will be equal to half month's manufacturing expenses.

The total investment in various assets works out to Rs.3,960 lakh. To this sum a desired cash balance may be added to get an estimate of working capital needs.

SECTION 3

CRITERIA FOR EVALUATION OF WORKING CAPITAL MANAGEMENT

In the first Section we have considered working capital in two ways. First, when working capital is viewed as the difference between 'current assets' and 'current liabilities' the basic objective of working capital appears to be one of providing adequate cover to meet the current obligations of a company as and when they become due. This approach lays greater emphasis on the 'liquidity' aspect of working capital. Second, when working capital is looked upon as the amount held in different forms of current assets to provide adequate support to the smooth functioning of the normal business operations of a company the objective becomes one of deciding on the trade-off between liquidity and profitability. While developing suitable criteria for the evaluation of working capital management we shall bear in mind both the approaches to working capital.

The following criteria may be adopted for evaluating the working capital management of a company:

Liquidity

By and large, the current assets of a company are considered to be more liquid than fixed assets. Even among the current assets, some items are considered to be much more liquid than others. In a descending order of liquidity, the current asset items can be stated as cash and bank balances, marketable securities, sundry debtors, raw material inventory, finished goods inventory and work-in-process inventory. But, of these items, inventories are considered to be less liquid as they have to pass through the different stages of the operating cycle before becoming accounts receivable and eventually back to cash. The ultimate test of liquidity is the ability of a company to meet its current obligations.

Although accounts receivables are generally considered to be liquid, the degree of liquidity depends upon the paying habits of customers and the collection efforts made by the company. So the degree of liquidity of current assets both in its qualitative and quantitative aspects has to be assessed. Consequently, the efficiency of working capital management can be regarded as the ability of a company to have adequate liquidity in its current assets so that it can honor its financial obligations without creating embarrassment of 'technical insolvency'. The criterion of liquidity can be quantitatively assessed by means of ratios to be discussed in subsequent paragraphs.

Availability of Cash

Even the most profitable companies may have faced at sometime or the other problems of cash shortage. In seasonal industries it is much more common to pass through bouts of cash shortage while in other cases it can happen because of mismatching of cash inflows and cash outflows. As a result companies keep some minimum cash balance. It should be noted that the larger the proportion of current assets held in the form of cash and bank balances, the liquidity position of the company improves but at the cost of sacrificing profitability as idle cash fetches no return. However, the great uncertainty surrounding future cash flows, lack of synchronization between cash inflows and cash outflows, the liquidity mix in terms of cash and bank balances and marketable securities, the attitude of management towards risk are some of the important factors that are likely to influence the proportion of cash in the total current assets of a company. This aspect will also be considered as part of the ratio analysis for the evaluation of the working capital management of a company.

Inventory Turnover

Any type of inventory will represent the amount of cash locked up and the amount of carrying costs, which can be as high as 25 percent of the value of inventory, associated with inventory. Too high a level of inventory and too low a level of inventory are not conducive to the financial health of a company as the former can create problems of liquidity while the latter can affect profitability due to stoppage of work for want of raw materials and/or loss of a customer for want of finished goods in the inventory in adequate quantity. The application of inventory theoretic models will help mitigate the problem but the utility of these models will eventually depend on the attitude of management towards risk. Thus risk-return trade-off is inevitable. However, turnover of inventory can be useful for comparisons across time, across companies belonging to the same industry or against norms stipulated by banks or by the company's budgeting system.

Credit Extended to Customers

In a competitive market environment, the output of a company is usually sold on credit basis. Credit sales has got many dimensions. Indiscriminate sale of output without reckoning with the credit standards may result in higher volume of sales, larger amount of cash locked up in the form of receivables and higher incidence of bad debt losses. By following high credit standards, the company's sales volume may get adversely affected.

It is therefore, necessary to ensure whether reasonable credit is provided to customers as part of the evaluation of working capital management. This can be quantified in the form of turnover of receivables or average collection period.

Credit Obtained from Suppliers

Just as a company extends credit to its customers it would also obtain credit from its suppliers in most cases. Working capital management should provide adequate flexibility to the purchase department so that they can shop around and obtain better terms for procurement of supplies. Further, regular payment habit on the part of the company can instill confidence in the minds of the suppliers. This can be quantified by the average payment period.

Under-Trading and Over-Trading

Before considering precautionary measures against under-trading and over-trading, let us first understand the meaning of these two terms, their financial implications and the precautionary measures to be taken.

UNDER-TRADING

A situation of under-trading arises in a company when the volume of sales is much less than the amount of assets employed. This becomes apparent when the performance of the company is compared against similar companies. Under-trading also indicates that funds of the company are locked up in current assets resulting in a lower turnover of working capital. Another way of stating under-trading is that a company is over capitalized compared to the volume of sales. As this would result in lower turnover, the company has to take precautionary measures such as altering capital structure so that the debt-equity ratio comes down, hastening the collection process, reducing the levels of inventory to reasonable levels compared to the sales forecast and production plans. Unless these measures are taken, the rate of return on equity is likely to come down as a result of which the market price of the company can be adversely affected.

OVER-TRADING

Over-trading is a situation which is the opposite of under-trading. The symptoms of over-trading can be noticed from the disproportionately high turnover of assets compared to the volume of sales. In the context of working capital over-trading can be noticed from high turnover of current assets compared to similar companies. While increase in the turnover of current assets is generally considered

to be a virtue, disproportionately high turnover is indicative of less amount of cash invested in current assets which can create problems of liquidity at the time of making payments for current obligations. The problem of over-trading can be restated as one of under capitalization.

Precautionary measures for over-trading can be taken by initially reducing the sales to a level commensurate with the amount of assets and a final solution lies in increasing the asset base through additional finances raised through the issuance of shares and/or obtaining loan funds.

Unless a company takes precautionary measures once it observes symptoms of over or under-trading, it may run into serious working capital problems as outlined above.

Profit Criterion for Working Capital

When we analyze whether to make an investment or not, we check whether the proposed investment will have a positive Net Present Value (NPV)[2]. The NPV of a proposed investment is calculated by deducting the present value of the outflows from the present value of the inflows. Investment in working capital should also be evaluated on the same lines. Yet, there is a significant difference between other types of investments and investment in current assets. Investment in current assets is generally completely realizable at the time of liquidation.

For these types of investments, the profit per period criterion is equivalent to the NPV criterion.

The profit per year on current assets would be:

$$P_r - P_k$$

Where

P_r = return for the year

P_k = cost of funds for the year.

The net present value, assuming that the investment in the current asset continues for n years will be

$$NPV = -P + P_r\,(PVIFA_{k,n}) + P\,(PVIF_{k,n})$$

On putting the values of PVIFA and PVIF in the formula and solving further, we get

$$NPV = (P_r - P_k)\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$$

Since the NPV criteria is a multiple of the profit per period criteria, they can be taken as equivalent. Hence, for the purpose of evaluating investment in working capital, the profit-per-period criteria can be used.

IMPORTANT WORKING CAPITAL RATIOS

Despite the usual limitations associated with ratios, ratio analysis is still popular among financial analysts. This is mainly attributable to the simplicity in calculation and indication of the direction in which further probing is necessary. We shall briefly outline below some of important ratios that can be used for gauging the efficiency of working capital management.

Current Ratio

This is the ratio of 'current assets' to 'current liabilities'. In a broad sense, the value of current ratio indicates the ability of a company to meet its current liabilities. A minimum current ratio of 1.33 has been recommended by the Tandon Committee and the same is followed by commercial banks.

2. **Note**: For details of NPV calculation, refer to the chapter on 'Capital Expenditure Decisions'.

Net working capital is regarded as the difference between 'current assets' and 'current liabilities', while current ratio is the amount of 'current assets' divided by the amount of 'current liabilities'. As a result the current ratio value of less than unity implies that net working capital is negative for the company. This is not a healthy sign as it amounts to a diversion of short-term funds for long-term purposes.

Quick Ratio

This ratio is calculated by considering quick assets ('current assets' – inventories) in the numerator and current liabilities in the denominator. As inventories are farther placed in the liquidity hierarchy of current assets these are not considered. Quick ratio is supposed to provide a better measure of the liquidity position of a company in meeting its current liabilities. A caution is needed here that sundry debtors that are slow moving may not be readily convertible into cash and, therefore, one cannot draw immediate inference as to the liquidity position of a company by the magnitude of quick ratio.

Cash to Current Assets

As cash on hand and at bank is the most liquid form of all the current assets the ratio of cash to current assets will indicate the liquidity position of a company much better than the earlier ratios. While a high ratio is indicative of better liquidity the opportunity loss sustained by the company by keeping a large amount of idle cash should also be taken note of.

Sales to Cash

This indicates the turnover of cash, the higher the turnover the better it is from the company's point of view. However, for a given level of sales, the higher turnover of cash can also indicate that the cash balance is less. Only by considering the turnover for a few years, one can draw meaningful conclusions as to the liquidity position of the company, as the relationship between cash balance and sales is not quite direct and easily comprehensible.

Average Collection Period

As this is discussed in detail in the chapter on Receivables Management it will not be repeated here. However, a few observations on it are relevant here. Average collection period can be compared with the credit period stipulated by the company. If the average collection period is found to be consistently higher than the net credit period extended by the company to its customers, then the collection effort has to be made more effective as cash is locked up for a period more than what is warranted by the credit terms extended.

Inventory Turnover Ratio

In the literature one comes across two definitions for inventory turnover ratio. The first one is to calculate the ratio of average sales to inventory. This ratio suffers from one shortcoming. While the numerator i.e., sales includes profit, the denominator by the very definition of inventory, cannot include profit. Consequently, this ratio's importance is considerably reduced.

An alternative definition calls for the calculation of cost of goods sold to average inventory. As both the numerator and denominator are devoid of profit element, this ratio is much more consistent than the earlier one.

By and large, the higher the turnover of inventory, the better it is from the point of view of efficiency in working capital management. However, caution is needed as very high turnover may be indicative of over-trading. This can be verified by comparing the ratio with that of the average for the industry or with that of the competitor company.

Working Capital to Sales

This ratio indicates the reciprocal of the popular ratio of working capital turnover. Working capital turnover is the ratio of sales to working capital and indicates how many times working capital has turned over during the year. Higher the turnover, the better it is for the company. Given the profit margin, sales and net fixed assets, the larger the turnover the higher will be the rate of return on net operating capital employed. Very low and very high turnover values will call for a closer look as they may be indicative of the symptoms of under-trading and over-trading respectively in its incipient stage. Precautionary measures can be initiated before the situation gets worsened. Similar arguments and comments (in the opposite way) will hold good in the case of working capital to sales ratio which is the reciprocal of working capital turnover.

While we have discussed some of the criteria for evaluating working capital management, certain aspects of management of working capital need more specific attention *viz.*, Inventory Management, Receivables Management and Cash Management. These have been covered under separate chapters. How a company decides to finance its current assets is also an important aspect of working capital management which we will study in the next chapter.

SUMMARY

- Financial statement analysis involves the application of analytical tools and techniques to financial data to get information that is useful in decision-making. As we have observed, the foundation of any good analysis is a thorough understanding of the objectives to be achieved and the uses to which it is going to be put. Such understanding leads to economy of effort as well as to a useful and most relevant focus on the points that need to be clarified and the estimates and projections that are required.
- So, to begin with, financial statement analysis is oriented towards the achievement of definite objectives. Importantly there are three types of users to whom the financial statement analysis could be very useful. They are short-term lenders, long-term lenders and stockholders. Having defined the objectives, the next step is to decide the tools of analysis. An important tool – Ratio Analysis is covered extensively in this chapter. Other tools covered are Comparative analysis and Du Pont analysis.
- The analysis of a ratio gives the relationship between two variables at a point of time and over a period of time. There are three kinds of ratios and they are liquidity ratio, profitability ratio and ownership ratio. Liquidity ratios measure the short-term liquidity of the firm with the help of ratios like current ratio, quick ratio and turnover ratios. Profitability ratios measure the operational efficiency of the firm. They give the details of how efficient the firm is in applying its resources to get the maximum returns. Ownership ratios help the present or future stockholder in assessing the value of his investment. Earning ratios, leverage ratios (capital structure and coverage ratios) and dividend ratios fall into the category of ownership ratios. Leverage ratios measure the long-term solvency of the firm. They are further divided into capital structure ratios and coverage ratios.
- Du Pont analysis divides a particular ratio into its components and studies the effect of each and every component on the ratio. Comparative analysis gives an idea as to where a firm stands across the industry and studies its financial trends over a period of time.
- The final step in analysis is the interpretation of the data and measures assembled as a basis for decision and action. This is the most important and difficult of the steps, and requires application of a great deal of judgments, skill, and effort.
- Though there are limitations for financial statement analysis, it is the only means by which the financial realities of an enterprise can be reduced to a common denominator that is quantified and that can be mathematically manipulated and projected in a rational and disciplined way.

Chapter XIV

Financing Current Assets

After reading this chapter, you will be conversant with:

- Behavior of Current Assets and Pattern of Financing
- Spontaneous Sources of Finance
- Trade Credit
- Short-term Bank Finance
- Public Deposits for Financing Current Assets
- Commercial Paper and Factoring
- Regulation of Bank Credit: Reports of Various Committees

SECTION 1

BEHAVIOR OF CURRENT ASSETS AND PATTERN OF FINANCING

At any point of time a manufacturing company will have some minimum level of current assets. This level is largely influenced by the operating cycle period of the company concerned and the policy of management to provide some degree of flexibility to the production and sales functions of the company. The minimum level of current assets maintained by a company is more in the nature of fixed assets and, therefore, can be regarded as 'permanent or fixed component' of current assets. For example, cash, receivables and inventory required to carry on the operations without any break.

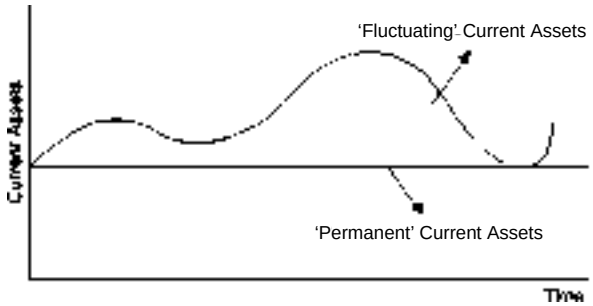
Fluctuating Component of Current Assets

Over and above the minimum level, the current assets of a company vary depending upon the level of activity or operations. For example, a higher level of finished goods inventory will enable the company to cope with the busy period demand for its product. Further, the level of Accounts Receivables will also tend to increase as a result of the increased level of sales. Thus, the level of current assets associated with the tempo of business activity can be regarded as the 'fluctuating or temporary component' of current assets. This component is likely to be more pronounced in seasonal industries where either the demand for output or the supply of the important input is seasonal in nature. Woollen garment-making companies are characterized by seasonal demand for output while sugar manufacturing companies are characterized by the seasonal nature in the supply of the important input, viz., sugarcane.

The Behavior of Current Assets

The level of current assets of a company can be looked upon as the permanent component of current assets superimposed by the fluctuating component. As the behavior of current assets in terms of fixed and fluctuating components has an important bearing on the pattern of financing to be normally adopted, the level of current assets over time (which can be restricted to a single accounting year) is depicted in figure 14.1 below.

Figure 14.1: Behavior of Current Assets



As can be seen from figure 14.1, the 'permanent component' of current assets is more in the nature of a fixed asset than of a current asset. However, this analogy cannot be stretched too far. The so called permanent current assets will go through the different stages of the operating cycle but are not locked-up permanently as in the case of fixed assets. However, the current assets released will be replaced thereby giving the appearance of 'permanency'. Consequently, the permanent component needs to be financed from the long-term sources of finance available to a company such as internal accruals, ordinary shares, preference shares, debentures and to some extent term loans. The 'temporary or fluctuating component' can be financed from short-term sources such as accounts payables or trade credit, short-term bank borrowings and public deposits. Although public deposits have a maturity period of two or three years they cannot be strictly considered as short-term source or a current liability. These have been included here keeping in view their end use.

From the above discussion, it is apparent that the 'behavior' of current assets influences in a broad sense the pattern of financing to be adopted by a company. Further, it lays down the logical foundation for the insistence of commercial banks (as per Tandon Committee recommendations to be discussed later in this chapter) that companies should place greater reliance on long-term sources towards financing current assets. It is also clear from the discussion that long-term sources should be used for financing fixed assets and part of the current assets (preferably the permanent component).

SPONTANEOUS SOURCES OF FINANCING CURRENT ASSETS

During the normal course of business operations, a company will usually have ready access to certain sources for financing its current assets to some extent. As these sources emerge in the normal course of business these are referred to as 'spontaneous' sources. These include accrued expenses, provisions and trade credit. As trade credit is one of the very important sources of finance. It merits a detailed discussion in its own right. It is taken up in the following section while the other two sources are considered below.

Accrued Expenses

These are basically liabilities covering expenses incurred on and prior to a specified date, payable at some future date. Typical examples of accrued expenses are accrued wages and salaries. In case, a company decides to make payment of wages on a monthly basis instead of weekly basis (assuming trade unions accept the policy change without demur) the amount of accrued wages will increase and the drain on cash resources is deferred by three weeks. It should be noted that 'accrued expenses' constitute a small fraction of current liabilities and its usefulness as a source of financing current assets is very much limited.

Provisions

These are basically charges for an estimated expense. Typical examples are provision for dividends, provision for taxes and provision for payment of bonus. Provisions also do not call for immediate cash drain. The drain on cash resources occurs when the actual amount of liability is known and paid for. The usefulness of 'provisions' as a source of financing current assets is very much limited.

TRADE CREDIT

Trade credit or accounts payables or sundry creditors is a very important spontaneous source for financing current assets. On an average, trade credit accounts for about 40 percent of current liabilities.

Trade credit has two important facets. The first one is to instill confidence in suppliers by maintaining good relations supported by prompt payment. This will enable a company to obtain trade credit. It may not be out of place here to mention that some of the reputed companies tend to stretch payment to their suppliers. In one instance involving an automobile manufacturing company, one of the supplying companies stopped supplies because of unduly delayed payments. This aspect needs a little elaboration. The second facet of trade credit relates to the cost of trade credit when suppliers provide an incentive in the form of cash discount for prompt payment. These two aspects are briefly discussed below.

Obtaining Trade Credit

Just as a company decides whether it should offer the facility of credit sales to its customers, which is discussed in the chapter on the management of receivables, the companies supplying materials will also consider whether or not to extend credit

sales to its customers. In order to obtain trade credit from its suppliers, a company has to prove its creditworthiness. This can be achieved by tackling the problem both quantitatively and qualitatively. The quantitative measures are outlined below:

- Good track record of profitability and liquidity. Profitability measures include return on investment, return on equity, earnings per share and dividends per share. Measures of liquidity include current ratio, quick ratio, average collection period and other liquidity ratios covered in chapter 6. As these measures have already been discussed in earlier chapters, no elaboration is made here.
- A record of prompt payment by the company to other suppliers will not only help in projecting a good image but also instill confidence in the potential suppliers as they get the information through the usual grapevine.

The qualitative measures are outlined below:

- Even in the case of companies which are profitable and reasonably well managed, external factors such as recession, wild cat strike by workers, etc., can impair its ability to pay promptly to its suppliers. In such situations, a free and frank discussion with the suppliers can go a long way in establishing the company's credibility.
- Once the suppliers are satisfied, the company can negotiate for payments to synchronize with the company's cash inflows. The arrangement will help reduce idle cash balances of the company.

Trade credit helps in paying at the end of the credit period for supplies received now and prevents immediate cash drain.

Cost of Trade Credit

Whenever a company purchases materials on credit basis the supplier stipulates the credit terms. If the credit period allowed is, say, net 30 days then the company can pay on the 30th day for the purchases made now. By paying earlier than the stipulated 30 day period the company is not going to gain anything. It is therefore, advisable to defer payment till the last day of the credit period. The question may arise whether trade credit under the terms net 30 days is cost-free or not. In so far as explicit cost is concerned, it can be regarded as cost-free. However, once we recognize the fact that the drain on the cash resources of the company is deferred by one month, then the amount of cash equal to the purchase value of materials can be utilized to earn some rate of return either by investing in short-term securities of equivalent maturity period or by crediting the same to its cash credit/over draft account thereby reducing the incidence of interest to some extent. This can be regarded as the opportunity gain associated with the prevention of cash drain for one month.

When suppliers offer credit terms such as 2/15, Net 30, there is a cost implicitly associated for not availing oneself of the cash discount of 2 percent offered for payment made on or before the 15th day of sale. As payment made beyond the 15th day but on the 30th day will not entitle the company for cash discount there is an implicit cost associated with 'buying' time for 15 days for not making payment. The implicit cost can be calculated as:

By not availing the cash discount the company is losing at the rate of 2/98 x 100 or 2.041 percent for gaining 15-day period for payment. The implicit cost is thus

$$\frac{2.041 \text{ x } 360 \text{ days}}{15 \text{ days}} = 48.98 \text{ percent, which is quite high.}$$

The above calculation can be summarized into a simple formula as shown below:

$$\frac{\text{Rate of discount}}{1 - \text{Rate of discount}} \text{ x } \frac{\text{Number of days in a year}}{(\text{Credit period} - \text{Discount period})}$$

In the above illustration, the implicit cost of not availing oneself of discount can be obtained as

$$\frac{0.02}{(1-0.02)} \times \frac{360}{(30-15)} = 48.98 \text{ percent.}$$

The cost of trade credit under different credit terms is presented below with a view to drawing broad conclusions on the relationship between the cost of trade credit and credit terms.

Credit Terms	Cost of Trade Credit
2/10, Net 30	36.72 percent
2/10, Net 45	20.99 percent
2/10, Net 60	14.69 percent
1/10, Net 30	18.18 percent
1/10, Net 45	10.39 percent
1/10, Net 60	7.27 percent
2/15, Net 30	48.98 percent
1/15, Net 30	24.24 percent

From the above calculations, we can make the following observations, all other factors under credit terms remaining the same.

- The higher the discount rate offered, the higher will be the cost of trade credit. This can be seen by comparing the cost of trade credit under the terms 2/10, Net 30 and 1/10, Net 30. By the same token the smaller the discount rate offered, the lower will be the cost of trade credit.
- The smaller the spread between credit and cash discount periods, the higher will be the cost of trade credit. This can be noticed, for example, by comparing the cost of trade credit under the terms 2/10, Net 30 and 2/15, Net 30. By the same token, the larger the spread between credit and cash discount periods, the lower will be the cost of trade credit.

On the basis of the above observations, the following aspects may be considered before taking policy decisions in respect of availing oneself of or foregoing cash discounts offered by suppliers to a company.

Cost of Trade Credit vs. Opportunity Cost of Cash

First, the usual credit terms offered by suppliers give rise to a high cost of trade credit. This will inevitably result in a decision to avail oneself of cash discount. However, it is preferable to calculate the implicit cost of trade credit and compare the same with the opportunity cost of cash. A decision to avail oneself of cash discount can be taken only when the cost of trade credit exceeds the opportunity cost of cash. For example, the cost of trade credit associated with the credit terms 1/10, Net 60 and, 1/10, Net 45 are only 7.27 percent and 10.39 percent respectively. In such situations, foregoing cash discounts is likely to be more advantageous from the company's point of view as the opportunity cost of cash can be much higher.

Flexibility to Cash

Secondly, if a company could not avail itself of the cash discount facility during the stipulated time period, for some reason or the other, it is more advantageous to pay the amount only on the date of expiry of the credit period. This strategy provides greater flexibility to cash without incurring any additional cost as payments made after the discount period but before the credit period will not result in any financial gain to the company.

Image of the Company

Thirdly, if delaying payment even beyond the stipulated credit period is not likely to impair the creditworthiness of a company this possibility can also be explored and utilized. However, frequent delays in payment beyond the normal credit period can adversely affect the company's image in the long run. Therefore, this course of action can be followed only when there are compelling reasons for delayed payment.

SHORT-TERM BANK FINANCE

Traditionally, bank finance is an important source for financing the current assets of a company. Bank finance is available in different forms. Bankers are guided by the creditworthiness of the customer, the form of security offered and the margin requirement on the assets provided as security. These aspects will be discussed below.

Bank finance may be either direct or indirect. Under direct financing the bank not only provides the finance but also bears the risk. Cash credit, overdraft, note lending, purchase/discounting of bills belong to the category of direct financing. When the bank opens a Letter of Credit in favor of a customer, the bank assumes only the risk of default by the customer and the finance is provided by a third party. Both direct and indirect forms of finance are briefly outlined below.

Cash Credit

Under the cash credit arrangement, the customer is permitted to borrow up to a pre-fixed limit called the cash credit limit. The customer is charged interest only on the amount actually utilized, subject to some minimum service charge or maintaining some minimum balance also known as compensatory balance in the cash credit account. The security offered by the customer is in the nature of hypothecation or pledge to be discussed later in this chapter under the head security. As per the banking regulations, the margins are specified on different types of assets provided as security. From the operational view point, the amount that can be borrowed at any time is the minimum of the sanctioned limit and the value/asset as reduced by the required margin. A simple illustration is given below for better understanding.

(Rs. in lakh)

	Situation A	Situation B
1. Sanctioned Limit	2	2
2. Value of Security	2	3
3. Margin Requirement	20%	20%
	(0.40)	(0.60)
4. Value of Security Less Margin:	1.6	2.4
5. Drawing Power = (Minimum of 1 and 4)	1.6	2

Overdraft

Overdraft arrangement is similar to the cash credit arrangement described above. Under the overdraft arrangement, the customer is permitted to overdraw upto a pre-fixed limit. Interest is charged on the amount(s) overdrawn subject to some minimum charge as in the case of cash credit arrangement. The drawing power is also determined as in the case of cash credit arrangement. Both cash credit and overdraft accounts are running accounts and are frequently treated synonymously. However, there is a minor technical difference between these two arrangements. Cash credit account operates against security of inventory and accounts receivables in the form of hypothecation/pledge. Overdraft account operates against security in the form of pledge of shares and securities, assignment of life insurance policies and sometimes even mortgage of fixed assets. While advances provided by banks in the form of cash credit or overdraft are technically repayable on demand, in actual practice it never happens. As a matter of fact, the chief executive of a nationalized bank remarked that the so called overdraft is more permanent than term loans sanctioned by financial institutions like IDBI as the latter are repaid while cash credit/overdraft is only re-negotiated for a further period referred to in common parlance as the "roll over phenomenon". This is peculiar to the Indian market.

Purchasing/Discounting of Bills

With a view to reduce reliance on cash credit/overdraft arrangement as also to create a market for bills which can be purchased by banks with surplus funds and sold by banks with shortage of funds the Reserve Bank of India has been trying hard for nearly two decades for the creation of an active bill market but with very limited success.

Under this arrangement, the bank provides finance to the customer either by outright purchasing or discounting the bills arising out of sale of finished goods. Obviously, the bank will not pay the full amount but provides credit after deducting its charges. To be on the safe side the banker will scrutinize the authenticity of the bill and the creditworthiness of the concerned organization besides covering the amount under the cash credit/overdraft limit.

Unlike open credit sale of goods which gives rise to accounts receivables, the bill system specifies the date by which the purchaser of goods has to make payment. Thus, the buyer is time-bound in his payment under this system which did not find much favor with many buyers. This is the real reason besides stamp duties etc., for the limited success of the bill market scheme.

Letter of Credit

Letter of credit is opened by a bank in favor of its customer undertaking the responsibility to pay the supplier (or the supplier's bank) in case its customer fails to make payment for the goods purchased from the supplier within the stipulated time. Letter of credit arrangement is becoming more and more popular both in the domestic and foreign markets. Unlike in other types of finance where the arrangement is between the customer and bank and the bank assumes the risk of non-payment and also provides finance, under the letter of credit arrangement the bank assumes the risk while the supplier provides the credit.

Security

As mentioned earlier, before taking a decision to provide financial assistance to a company the bank will consider the creditworthiness of the company and the nature of security offered. For providing accommodation towards financing the current assets of a company, the bank will ask for security in the form of hypothecation and/or pledge.

Hypothecation

By and large, security in the form of hypothecation is limited to movable property like inventories. Under hypothecation agreement, the goods hypothecated will be in the possession of the borrower. The borrower is under obligation to prominently display that the items are hypothecated to such and such a bank. In the case of limited companies, the hypothecation charge is required to be registered with the Registrar of Companies of the state where the registered office of the company is located.

Pledge

Unlike in the case of hypothecation, in a pledge, the goods/documents in the form of share certificates, book debts, insurance policies, etc., which are provided as security will be in the possession of the bank lending funds but not with the borrowing company. Thus possession of items of security, distinguishes pledge from hypothecation. In the event of default by the borrowing company either under hypothecation or pledge, the lender can sue the company that has borrowed funds and sell the items of security to realize the amount due, on giving the pledger reasonable notice of the sale.

PUBLIC DEPOSITS FOR FINANCING CURRENT ASSETS

Regulations imposed on the availability of bank finance have induced many companies to explore alternative sources for financing their current assets. Mobilization of funds from general public, especially from the middle and upper middle class people, by offering reasonably attractive rates of interest has become an important source. The deposits thus mobilized from public by non-financial manufacturing companies are popularly known as 'Public Deposits' or 'Fixed deposits'. These are governed by the regulations of public deposits under the Companies (Acceptance of Deposits) Amendment Rules, 1978. Let us consider the salient features of public deposits from the legal point of view and later as a source of finance from the viewpoint of the company mobilizing such deposits.

Salient Features of 'Public Deposits'

- A company cannot raise more than 10 percent of its 'paid-up share capital' and 'free-reserves'. However, for the purpose of calculating the maximum amount a company can raise from public, the treatment accorded to reserves is in favor of the company. For Illustration, 'capital redemption reserve' is treated as part of free reserves and 'share premium account' is treated as part of paid-up share capital. This will allow a company to raise more money even within the 10 percent limit. Government companies can accept deposits up to 35% of their paid-up share capital and free reserves.
- The maximum maturity period allowed for public deposits is three years while the minimum permitted maturity period is six months. In certain cases, a maturity period of even three months also is allowed. By and large companies invite public deposits with maturity periods of 1, 2 and 3 years.
- A company inviting deposits from the public is required to issue an advertisement disclosing the following details and the same has to be filed with the Registrar of Companies before releasing it to the press. The details contained in the advertisement are:
  - Name of the company.
  - Date of incorporation.
  - Business carried out by the company and its subsidiary with the registered office and details of branches and units, if any.
  - Particulars of the management and board of directors indicating the names, addresses and occupations.
  - Profits and dividends of the company over the preceding three consecutive years.
  - Summarized financial position of the company as appearing in the two latest audited balance sheets along with brief particulars of contingent liabilities.
  - Declaration in respect of compliance with the provisions of Companies (acceptance of deposits) Rules as amended up-to-date; that the deposits to be accepted by the company are of unsecured nature and as such rank pari passu with other unsecured loans of the company; that compliance with rules does not imply repayment of deposits is guaranteed by the Central Government.

Evaluation of Public Deposits from the Company's Point of View

From the point of view of the company, public deposits are quite advantageous for the following reasons:

- The procedure involved in raising public deposits is fairly simple, as it does not involve underwriting and related issue expenses are minimal.
- No security is offered in the case of public deposits while security in the form of hypothecation/pledge is necessary for procuring bank finance and

mortgage of assets in the case of long-term debt. Thus, the unencumbered assets can be used in raising further funds from banks/financial institutions.

- The after-tax cost of public deposits will be much less than the after-tax cost of bank borrowing.
- As public deposits with maturity periods of two and three years cannot be regarded as current liabilities, the calculation of 'working capital gap' by the bankers to provide short-term finance is likely to be favorable from the company's point of view.
- Unlike term loans/bank finance, public deposits will not have restrictive covenants in respect of dividend payments, appointment of senior executives etc.

Despite the advantages associated with public deposits outlined above, there are certain limitations which have to be recognized.

- The scope for mobilization of public deposits is somewhat limited.
- With the maximum maturity period being limited to three years, debt servicing may become difficult.
- If there is a grain of truth in the allegations made in one of the reputed business magazines that some well reputed companies failed to honor their commitments in the repayment of public deposits, the middle class people may not be forthcoming to invest their hard earned savings in public deposits of companies. This has two repercussions. First, a very useful source for financing the current assets of a company may dry up. Secondly, the Reserve Bank of India cannot afford to turn a blind eye to the malpractices/abuse of public funds and may come up with greater restrictions.

Considering both pros and cons, it is obvious that the public deposits are quite advantageous from the point of view of a company.

COMMERCIAL PAPER AND FACTORING

Commercial Papers (CPs) are short-term usance promissory notes with a fixed maturity period, issued mostly by leading, reputed, well-established, large corporations who have a very high credit rating. It can be issued by body corporates whether financial companies or non-financial companies. Hence, it is also referred to as Corporate Paper.

CPs are mostly used to finance current transactions of a company and to meet its seasonal need for funds. They are rarely used to finance the fixed assets or the permanent portion of working capital. The rise and popularity of CPs in other countries like USA, UK, France, Canada and Australia, has been attributed to the limitations and difficulties they experienced in obtaining funds from banks.

Factoring is a "continuing" arrangement between a financial intermediary called a "Factor" and a "Seller" (also called a client) of goods or services. Based on the type of factoring, the factor performs the following services in respect of the Accounts Receivables arising from the sale of such goods or services.

- Purchases all accounts receivables of the seller for immediate cash.
- Administers the sales ledger of the seller.
- Collects the accounts receivable.
- Assumes the losses which may arise from bad debts.
- Provides relevant advisory services to the seller.

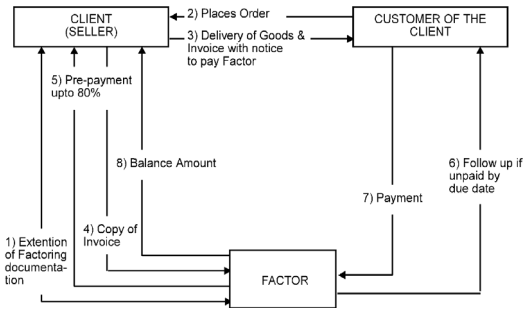
Factors are usually subsidiaries of banks or private financial companies. It is to be noted that factoring is a continuous arrangement and not related to a specific transaction. This means that the factor handles all the receivables arising out of the credit sales of the seller company and not just some specific bills or invoices as is done in a bills discounting agreement.

Mechanics of Factoring

The factoring arrangement starts when the seller (client) concludes an agreement with the factor, wherein the limits, charges and other terms and conditions are mutually agreed upon. From then onwards, the client will pass on all credit sales to the factor. When the customer places the order, and the goods along with invoices are delivered by the client to the customer, the client sells the customers account to the factor and also informs the customer that payment has to be made to the factor. A copy of the invoice is also sent to the factor. The factor purchases the invoices and makes prepayment, generally up to 80% of the invoice amount. (Just as in the case of cash credit, for factoring also, a "drawing power" is fixed based on a margin which is normally around 20%. The client is free to withdraw funds up to the drawing power). The factor sends monthly statements showing outstanding balances to the customer, copies of which are also sent to the client. The factor also carries follow-up if the customer does not pay by the due date. Once the customer makes payment to the factor, the balance amount due to the client is paid by the factor.

The factoring process is explained in figure 14.2.

Figure 14.2: Mechanics of Factoring



Servicing and Discount Charges

For rendering the services of collection and maintenance of sales ledger, the factor charges a commission which varies between 0.4% to 1% of the invoice value, depending upon the volume of operations. This service charge is collected at the time of purchase of invoices by the factor. For making an immediate part-payment to the client, the factor collects discount charges from the client. These discount charges are comparable to bank interest rates in that it is calculated for the period between the date of advance payment by the factor to the client and the date of collection by the factor from the customer. These are collected monthly.

Types of Factoring

Factoring can be classified into many types. This section covers only those forms of factoring which are more prevalent in India today.

1. **Recourse Factoring:** Under recourse factoring, the factor purchases the receivables on the condition that any loss arising out of irrecoverable receivables will be borne by the client. In other words, the factor has recourse to the client if the receivables purchased turn out to be irrecoverable.

2. **Non-recourse or Full Factoring:** As the name implies, the factor has no recourse to the client if the receivables are not recovered, i.e., the client gets total credit protection. In this type of factoring, all the components of service viz., short-term finance, administration of sales ledger and credit protection are available to the client.

3. **Maturity Factoring:** Under this type of factoring arrangement, the factor does not make any advance or pre-payment. The factor pays the client either on a guaranteed payment date or on the date of collection from the customer. This is as opposed to "Advance factoring" where the factor makes prepayment of around 80% of the invoice value to the client.

4. **Invoice Discounting:** Strictly speaking, this is not a form of factoring because it does not carry the service elements of factoring. Under this arrangement, the factor provides a pre-payment to the client against the purchase of accounts receivables and collects interest (service charges) for the period extending from the date of pre-payment to the date of collection. The sales ledger administration and collection are carried out by the client.

In terms of the services available to the client, these 4 types of factoring can be illustrated with the help of table 14.1:

Table 14.1

Types of Factoring \ The Service	Short-term Finance	Sales Ledger Administration	Credit Protection
Recourse Factoring	✓	✓	×
Non recourse Factoring	✓	✓	✓
Maturity Factoring	×	✓	×
Invoice Discounting	✓	×	×

There are also other types of factoring such as Bank Participation Factoring, Supplier Guarantee Factoring, and Cross Border or International Factoring which are beyond the scope of this chapter.

Factoring in India

While factoring in the modern sense of the term is more than three decades old in Europe and other developed countries, it came to India as a result of the recommendations of the 'Kalyansundaram Committee' a study group set up at the request of RBI, much later. The first two factoring companies in India, viz., SBI Factors and Commercial Services Ltd. and Canbank Factors Ltd. commenced operations in 1991. These companies provide only recourse factoring at present. Private financial companies are also planning to enter the factoring arena.

SECTION 2

REGULATION OF BANK CREDIT – REPORTS OF VARIOUS COMMITTEES

Traditionally, bank finance is an important source of financing the current assets of companies. The banking sector provides the funds so long as there is adequate security for the funds lent. The security-oriented approach followed by the banking sector has resulted in over-financing large and, to some extent, medium scale companies who could provide adequate security. As a result, those companies could utilize the money for piling up stocks with a view to derive holding period gains as the rate of inflation was high and for the diversion of bank finance, which is basically meant to meet the short-term credit needs, for acquiring fixed assets.

In the wake of nationalization of major banks in 1969, the banking sector had been called upon to act as catalyst in the overall development of different sections of society. The development potential approach had to be adopted by the banking sector in place of security-oriented approach. Consequently, the demand on bank finance had gone up considerably. This had resulted in focusing attention on the weaknesses of the system followed by the banks earlier.

First, the cash credit/overdraft system followed by the banks had been tilted to favor borrowers rather than the banks. Once the cash credit limit is decided, then the quantum of funds to be utilized is decided by the needs of the borrower and not

on the availability of funds lying with the bank at that point in time. As a result, credit planning by the banks had become extremely difficult.

Secondly, the banks are called upon to provide financial assistance to weaker sections of the society who may not be in a position to provide security.

Thirdly, large and medium borrowers abused bank finance to acquire stock much more than warranted by the production programs and to divert funds for other uses unrelated to working capital.

It is against this backdrop, that the Reserve Bank of India had appointed some special study groups for streamlining the practices followed by banks so that the weaknesses of the existing practices are removed and a better sense of direction provided to the banking sector. We shall confine ourselves to four important committees. These are – the Tandon Committee, the Chore Committee, the Marathe Committee and the Kannan Committee.

Summary of Recommendations of the Tandon Committee

The Reserve Bank of India (RBI) constituted in July 1974 a study group to frame guidelines for the follow-up of bank credit programs under the chairmanship of P.L.Tandon. The report submitted by the committee in August, 1975 is popularly referred to as the Tandon Committee Report. The terms of reference for the committee were:

- To suggest guidelines for commercial banks to follow up and supervise credit to ensure proper end-use of funds and to keep a watch on the safety of the advances and to suggest the type of operational data and other information that may be obtained by banks periodically from such borrowers and by the Reserve Bank of India from the lending banks.
- To make recommendations for obtaining periodical forecasts from borrowers of (a) business/production plans and (b) credit needs.
- To make suggestions for prescribing inventory norms for different industries both in the private and public sectors and indicate the broad criteria for deviating from these norms.
- To suggest criteria regarding satisfactory capital structure and sound financial basis in relation to borrowings.
- To make recommendations regarding the sources for financing the minimum working capital requirements.
- To make recommendations as to whether the existing pattern of financing working capital requirements by cash credit/overdraft system etc., requires to be modified, and if so, to suggest suitable modifications, and
- To make recommendations on any other related matter as the group may consider germane to the subject of enquiry or any other allied matter which may be specifically referred to it by the Reserve Bank of India.

The study group reviewed the existing practices, obtained views from different associations of industries, chambers of commerce and executives and came up with a comprehensive set of recommendations. These may be broadly grouped under the following four heads outlined below.

NORMS FOR INVENTORY AND RECEIVABLES

The Committee has come out with a set of norms that represent the maximum levels for holding inventory and receivables in each of 15 major industries, covering about 50 percent of industrial advances of banks. As norms cannot be rigid, deviations from norms can be permitted under extenuating circumstances such as bunched receipt of raw materials including imports, power-cuts, strikes, transport bottlenecks etc., for usually short periods. Once normalcy is restored, the norms should become applicable. The norms should be applied to all industrial borrowers with aggregate limits from the banking system in excess of Rs.10 lakh and extended to smaller borrowers progressively.

APPROACH TO LENDING

- As a lender, the bank should only supplement the borrower's resources in carrying a reasonable level of current assets in relation to his production requirements.
- The difference between total current assets and current liabilities other than bank borrowing is termed as working capital gap. The bank should finance a part of the working capital gap and the balance should be financed through long-term sources comprising equity and long-term borrowings.
- Three alternative methods have been suggested for calculating the maximum permissible bank borrowing. These methods will progressively reduce the maximum permissible bank borrowing. These three methods are explained by means of a numerical illustration which indicates the projected financial position as at the end of the next year.

Illustration14.1

The financial position of Simplex Co. Ltd., has been projected for the forthcoming year as summarized below:

Current Liabilities		Current Assets*	
	(Rs. in lakh)		(Rs. in lakh)
Accounts Payable	150	Raw Materials	250
Other Current Liabilities	50	Work-in-Process	50
		Finished Goods	150
	200	Receivables	90
Bank borrowings (including bills discounted with banks)	360	(including bills discounted with banks)	
		Other Current Assets	20
	560		560

* As per suggested norms or past practice, whichever is lower, in relation to projected production for the forthcoming year.

Under Method I, the bank will finance at the most 75 percent of the working capital gap i.e., maximum permissible bank finance = 0.75 (Current Assets - Current Liabilities).

This method will ensure a minimum current ratio of unity.

Under Method II, the borrower will finance 25 percent of total current assets (140) through long-term sources. The bank will finance at the most 220 of the working capital gap (360 – 140). i.e, maximum permissible bank finance = (0.75 x Current Assets) – Current Liabilities. This method will ensure a current ratio of 1.33.

Under Method III, there will be further reduction in bank borrowings which will ensure a still higher current ratio. The amount of excess borrowing calculated as the difference between the amount of bank borrowing and the maximum permissible bank borrowing to which the borrower is eligible will be converted into a term loan, that is to be repaid over a suitable period, depending upon the cash generating capacity and ability to raise additional equity etc., i.e., maximum permissible bank finance = 0.75 (Current Assets – Core Current Assets) – Current Liabilities.

Method I

Total Current Assets :	560
Less : Current Liabilities other than Bank Borrowings	200
Working Capital Gap	360
25% of above from long-term sources	90
Maximum Permissible Bank Borrowings (75% of 360)	270
Excess Borrowing:	90
Current Ratio = $\frac{560}{470}$	1.19

Method II

Total Current Assets :	560
25% of above from long-term sources	140
75% of current assets	420
Less : Current Liabilities other than Bank Borrowings	200
	220
Working Capital Gap	360
Maximum Permissible Bank Borrowings	220
Excess Borrowing:	140
Current Ratio = $\frac{560}{420}$	1.33

Method III

Total Current Assets:	560
Less: 'Core' Current Assets (illustrative figure) from long-term sources	100
Real Current Assets	460
25% of above long-term sources	115
	345
Less: Current liabilities other than Bank Borrowings	200
	145
Working Capital Gap:	360
Maximum Permissible Bank Borrowings	145
Excess Borrowing:	215
Current Ratio = $\frac{560}{345}$	1.62

STYLE OF CREDIT

The Tandon Committee suggested the following:

- Instead of making available the amount to which a borrower becomes eligible, the bank may bifurcate the credit limit into a loan and a demand cash credit, which will be reviewed annually.
- The irreducible minimum level of borrowing which is expected to be used throughout the year will comprise the loan component while the fluctuating part will be taken care of by the cash credit component.
- As the loan component carries interest throughout the year it will induce financial discipline on the part of the borrower to plan his credit needs carefully.
- As the intention of the proposed approach is to ensure financial discipline on the part of the borrower the interest rate structure can be charged such that, the rate of interest on loan component is lower than the rate of interest on cash credit component while the rate of interest chargeable on excess borrowing converted into a term loan should carry a slightly higher interest rate than the cash credit component.
- A part of the total eligible amount could also be provided by way of bill limits to finance the selling company's receivables, besides the cash credit and loan components. This is likely to ensure proper-end-use of credit.

INFORMATION SYSTEM

The information system suggested by the committee is intended to induce better planning of the credit needs by the borrowing company, ensure end-use of credit for the intended purpose and to ensure better monitoring of the borrower's credit situation by the banker. Keeping these aspects in view, the committee had recommended a quarterly budgeting-cum-reporting system. The following statements are to be submitted by the borrowing company.

- Quarterly profit and loss statement giving details of previous year's actuals, current year's budget, previous quarter's budget and actuals, and current quarter's projections of revenues, costs and profit.
- Quarterly statement of current assets and current liabilities giving details of raw material inventory (imported and indigenous) work-in-process; finished goods and consumable stores; receivables; advances to suppliers and other current assets and current liabilities.
- Half-yearly proforma balance sheet and profit and loss statement within two months.
- Annual audited accounts within three months and
- Monthly stock statement in required detail so as to enable the banker to reconcile stocks of raw materials and finished goods.

The Tandon Committee had identified the problems associated with cash credit system and recommended for the bifurcation of the credit limit into a loan component and a fluctuating cash credit component. The information system recommended by the committee is intended to ensure proper end-use of credit besides introduction of financial discipline on the part of borrowing companies.

Summary of Recommendations of Chore Committee

Various committees constituted by the Reserve Bank of India including the Tandon Committee had pointed out the drawbacks of the cash credit system. Though the Tandon Committee had recommended for the bifurcation of the credit limit into a demand loan and a fluctuating cash credit component, the progress achieved in this respect had been very slow. Consequently, a small working group was set up by the Reserve Bank of India under the chairmanship of Shri K. B. Chore in April 1979 with specific terms of reference outlined below:

TERMS OF REFERENCE OF THE CHORE COMMITTEE

- To review the operation of the cash credit system in recent years, particularly with reference to the gap between sanctioned credit limits and the extent of their utilization;
- In the light of the review, to suggest:
  - modifications to the system with a view to making the system more amenable to rational management of funds by commercial banks and/or
  - alternative types of credit facilities, which would ensure greater credit discipline and also enable banks to relate credit limits to increases in output or other productive activities, and
- To make recommendations on any other related matter as the group may consider germane to the subject.

The Working Group had analyzed the existing data in respect of cash credit/overdraft by the banking sector, practices followed by other countries and submitted its report on August 31, 1979. The recommendations of the Chore Committee were accepted by the Reserve Bank of India and implemented by the commercial banks. Summary of the recommendations made by the committee is presented below:

1. The advantages of the existing system of extending credit by a combination of the three types of lending, viz., cash credit, loan and bill should be retained. At the same time it is necessary to give some directional changes to ensure that wherever possible the use of cash credit would be supplanted by loans and bills. It would also be necessary to introduce necessary corrective measures to remove the impediments in the use of bill system of finance and also to remove the drawbacks observed in the cash credit system.

2. Bifurcation of cash credit limit into a demand loan portion and a fluctuating cash credit component has not found acceptance either on the part of the banks or the borrowers. Such bifurcation may not serve the purpose of better credit planning by narrowing the gap between sanctioned limits and the extent of utilization thereof. It is not likely to be voluntarily accepted nor does it confer enough advantages to make it compulsory.
3. The need for reducing the over-dependence of the medium and large borrowers – both in the private and public sectors – on bank finance for their production/trading purposes is recognized. The net surplus cash generation of an established industrial unit should be utilized partly at least for reducing borrowing for working capital purposes.
4. In order to ensure that the borrowers do enhance their contributions to working capital and to improve their current ratio, it is necessary to place them under the second method of lending recommended by the Tandon Committee which would give a minimum current ratio of 1.33:1. As many of the borrowers may not be immediately in a position to work under the second method of lending, the excess borrowings should be segregated and treated as a working capital term loan which should be made repayable in installments. To induce the borrowers to repay this loan, it should be charged a higher rate of interest. For the present, the group recommends that the additional interest may be fixed at two percent per annum over the rate applicable on the relative cash credit limits. This procedure should be made compulsory for all borrowers (except sick units) having aggregate working capital limits of Rs.10 lakh and over.
5. While assessing the credit requirements, the bank should appraise and fix separate limits for the 'normal non-peak level' as also for the 'peak level' credit requirements indicating also the periods during which the separate limits would be utilized by the borrower. This procedure would be extended to all borrowers having working capital limits of Rs.10 lakh and above. One of the important criteria for deciding such limits should be the borrowers' utilization of credit limits in the past.
6. If any ad hoc or temporary accommodation is required in excess of the sanctioned limit to meet unforeseen contingencies, the additional finance should be given, where necessary through a separate demand loan account or a separate 'non-operable' cash credit account. There should be a stiff penalty for such demand loan or 'non-operable' cash credit portion, at least two percent above the normal rate, unless Reserve Bank exempts such penalty. This discipline may be made applicable in cases involving working capital limits of Rs.10 lakh and above.
7. The borrower should be asked to give his quarterly requirement of funds before the commencement of the quarter on the basis of his budget, the actual requirement being within the sanctioned limit for the particular peak level and non-peak level periods. Drawings less than or in excess of the operative limit so fixed (with a tolerance of 10 percent either way) but not exceeding sanctioned limit would be subject to a penalty to be fixed by the Reserve bank from time to time. For the time being, the penalty may be fixed at 2 percent per annum. The borrower would be required to submit his budgeted requirements in triplicate and a copy would be sent immediately by the branch to the controlling office and the Head Office for record. The penalty would be applicable only in respect of parties enjoying credit limits of Rs.10 lakh and above, subject to certain exemptions.
8. The non-submission of the returns in time is partly due to certain features in the forms themselves. To get over this difficulty, simplified forms have been proposed. As the quarterly information system is part and parcel of the revised style of lending under the cash credit system, if the borrower does not submit the return within the prescribed time, he should be penalized by

charging for the whole outstandings in the account at a penal rate of interest, one percent per annum more than the contracted rate for the advance from the due date of the return till the date of its actual submission.

9. Requests for relaxation of inventory norms and for ad hoc increases in limits should be subjected to close scrutiny by banks and agreed to only in exceptional circumstances.
10. The banks should devise their own check lists in the light of the instructions issued by the Reserve Bank for the scrutiny of data at the operational level.
11. Delays on the part of banks in sanctioning credit limits could be reduced in cases where the borrowers co-operate in giving the necessary information about their past performance and future projections in time.
12. As one of the reasons for the slow growth of the bill system is the stamp duty on usance bills and difficulty in obtaining the required denominations of stamps, these questions may have to be taken up with the State Governments.
13. Banks should review the system of financing book debts through cash credit and insist on the conversion of such cash credit limits into bill limits.
14. A stage has come to enforce the use of drawee bills in the lending system by making it compulsory for banks to extend at least 50 percent of the cash credit limit against raw materials to manufacturing units whether in the public or private sector by way of drawee bills. To start this, discipline should be confined to borrowers having aggregate working capital limits of Rs.50 lakh and above from the banking system.
15. Banks should insist on the public sector undertakings/large borrowers to maintain control accounts in their books to give precise data regarding their dues to the small units and furnish such data in their quarterly information system. This would enable the banks to take suitable measures for ensuring payment of the dues to small units by a definite period by stipulating, if necessary, that a portion of limits for bills acceptance (drawee bills) should be utilized only for drawee bills of small scale units.
16. To encourage the bill system of financing and to facilitate call money operations, an autonomous financial institution on the lines of the Discount Houses in the U.K. may be set up.
17. No conclusive data are available to establish the degree of correlation between production and quantum of credit at the industry level. As this issue is obviously of great concern to the monetary authorities, the Reserve Bank may undertake a detailed scientific study in this regard.
18. Credit control measures to be effective will have to be immediately communicated to the operational level and should be followed up. There should be a 'Cell' attached to the Chairman's office at the Central Office of each bank to attend such matters. The Central Offices of banks should take a second look at the credit budget as soon as changes in credit policy are announced by the Reserve Bank and revise their plan of action in the light of the new policy and communicate the correct measures to the operational levels as quickly as possible.
19. Banks should give particular attention to monitor the key branches and critical accounts.
20. The communication channels and systems and procedures within the banking system should be toned up so as to ensure that minimum time is taken for collection of instruments.
21. Although banks usually object to their borrowers dealing with other banks without their consent, some of the borrowers still maintain current accounts and arrange bill facilities with other banks, which vitiate the credit discipline. Reserve bank may issue suitable instructions in this behalf.

Summary of Recommendations of the Marathe Committee

With a view to regulate the growth of bank credit the Reserve Bank of India has advised all commercial banks to obtain its prior authorization before sanctioning credit limit to any single party with a limit of Rs.1 crore or above from the entire banking sector. This was felt imperative as the economy was passing through a period of considerable stress during 1965 and the stipulation of the Reserve Bank provided an additional measure of credit regulation for ensuring greater alignment of bank credit to the requirements of the plan. This regulation of RBI is the genesis for what has come to be known more popularly as the credit authorization scheme (CAS).

Since 1965 many environmental changes took place. These include – the nationalization of banks in 1969; the fixing up of percentages of bank credit to priority sector borrowers such as small scale industries, agriculture etc; the recommendations of Dehejia Committee report which highlighted the need for banks to take into consideration a broad view of the borrowers operations rather than be guided solely by security orientation; the recommendations of Tandon and Chore Committees which underlined the need for banks to switch over from security oriented approach to 'end-use' or 'need-based' approach that called for greater financial discipline on the part of banks as well as borrowers; the Krishnaswamy Committee report of 1980 which provided guidelines for fixing sub-targets for 'weaker' sectors in the wake of 20 Point Program in 1976; and Integrated Rural Development Program in 1979; and the recommendations of the Ghosh Committee report in 1982 which refined further the definitions and 'Groups' needing special attention in lending operations. In the light of these environmental changes, the credit authorization scheme also underwent several changes. The credit limit originally fixed at Rs.1 crore has been progressively increased to Rs.3 crore and later in certain cases to Rs.5 crore. It is against this backdrop that the Reserve Bank of India, set up a committee under the chairmanship of Shri S. S. Marathe in November, 1982 with the following terms of reference.

TERMS OF REFERENCE OF THE MARATHE COMMITTEE

- To examine the objectives, scope and content of the scheme and make suggestions with regard to making modifications therein, if any, having regard to the changing economic situation.
- To examine the adequacy or otherwise of the credit appraisal machinery/procedures in commercial banks, and based thereon, suggest modifications, if any, in the modalities in this behalf.
- To study the existing set-up for compliance with the requirements of the scheme within the commercial banks at the head and regional office levels and suggest any modifications therein considered necessary to facilitate proper appraisal and expeditious disposal of applications and monitoring thereof.
- To examine the existing data base relevant for making recommendations by banks to Reserve Bank of India for authorizing a given level of credit for a particular party and suggest modification/ simplification, if any, in that behalf.
- To examine the existing format for submitting applications by banks to Reserve Bank of India in respect of seeking authorization and suggest modifications therein, if necessary.
- To study the desirability of introducing time bound guidelines to be observed within commercial banks and Reserve Bank for speeding up the processing and disposal of applications.
- To make any other recommendations which are germane to the scheme.

BROAD-BASING THE OBJECTIVES OF CREDIT AUTHORIZATION SCHEME

After making a thorough study of CAS in its historical perspective, the committee had followed broad-based objectives of CAS whose initial aim was to closely align the growth of bank credit with the requirements of the plan and use it as an additional measure of credit regulations. The enlarged objectives of CAS are:

- To ensure that additional bank credit is in conformity with the approved purposes and priorities and that the bigger borrowers do not pre-empt scarce resources;
- To enforce financial discipline on the larger borrowers, where necessary, on uniform principles;
- Where a borrower is financed by more than one bank, to ensure that the customer's proposal is assessed in the light of the information available with all the banks; and
- To bring about improvements in the techniques of credit appraisal by banks and their system of follow-up.

Kannan Committee Recommendations

Kannan Committee headed by Bank of Baroda chairman, Mr. K. Kannan was formed on the suggestion of the Reserve Bank of India in January, 1997 to examine the validity of the MPBF concept and to suggest what could replace it. The report submitted in March, 1997 gave the following recommendations:

The report suggested doing away with the prescribed uniform formula for MPBF with the bank having sole discretion to determine the borrowing limits of corporates.

In a significant move, the committee has said that developing the modalities of working capital assessment of borrowers will be left to the banks, which may devise a flexible system. Corporate borrowers may be allowed to issue short-term working capital debentures of 12-18 months' maturity and banks may subscribe to such debentures as working capital assistance.

Alternatively, borrowers with working capital requirements of over Rs.20 crore may be granted working capital facility in full by way of a demand loan. Borrowers with requirements of over Rs.10 crore up to Rs.20 crore may have a loan component of 75 percent.

Interest rate incentives will be provided to borrowers availing full working capital finance by way of loan component. Also, margin and holding level of stocks, book-debts, etc. as security for working capital facility, may entirely be left to the discretion of the financing bank. The current benchmark ratio of 1.33 and matters relating to the ideal debt-equity ratio of the borrower should also be left to the discretion of the financing bank. Borrowers have to obtain prior approval for investment of funds outside the business, like inter-corporate deposits, investment in associate concerns or in other investments.

The committee recognizes that the existing norms/guidelines as prescribed by the Tandon-Chore Committee in 1974 do not serve the needs of the productive sectors of the economy. It recommended that need-based working capital finance should be made available without sticking to an age-old rule which may have largely outlived its utility.

Nayak Committee Recommendations

A committee headed by Mr P R Nayak, ex-Deputy Governor of RBI was set up in December, 1991 to look into the adequacy of the institutional credit to SSI sector, suggest modifications to the financing norms to SSI as per Tandon-Chore Committee norms and revisions, if any, for the rehabilitation of sick SSI units. Among them the relevant portions for the computation of working capital are that the working capital requirement of SSI should be worked out based on the projected turnover and the limit should be to the extent of 20% of such projected

turnover. This recommendation was accepted and the process of assessment of working capital requirement was made very simple and easy. But the onus lies with the bank to check up the genuineness of the projected turnover. If the request for working capital is from a new borrower who is starting the venture, the bank has to compare the projected turnover with the performance of already existing entrepreneurs in the same industry. If the proposal is for a renewal of the existing limit of working capital, the projected enhanced turnover should be studied from the angle of previous years' performance and the possible trend that could be extrapolated.

As per the extant guidelines from the RBI, banks are advised to follow turnover method of assessment of working capital requirement mentioned above for limits up to Rs.2 crore in the case of other than SSI borrowers and up to Rs.5 crore for SSI borrowers. In respect of loans beyond these limits banks have been given discretion to choose any method like MPBF method or cash budget method, etc. Even while applying MPBF, the level of current ratio to be maintained has been left to the discretion of the individual bank.

Implementation of Loan Delivery System: In terms of the guidelines of RBI, the working capital limit sanctioned to all borrowal accounts with fund based working capital limit of Rs.10 crore and above from the banking system, funds are to be disbursed as demand loan and cash credit in the ratio of 80:20. The demand loan portion of the working capital is called Working Capital Demand Loan which is repayable with in a year. This was brought in to introduce more discipline among the borrowers availing the working capital finance.

SUMMARY

- Any company will need to maintain a minimum level of current assets at any point of time. This level can be termed as the 'permanent' or 'fixed' component of current assets. Above this level, the current assets vary as per the level of activity of the company – higher the level of activity, more the current assets required. Since the 'permanent' component of current assets are locked up permanently within the organization just as fixed assets, this component needs to be financed from long-term sources of finances such as internal accruals, equity shares, preference shares, debentures and to an extent, term loans.
- The 'fluctuating' component of current assets can be financed through short-term sources such as accounts payable/trade credit, short-term bank borrowings and public deposits. Some other sources of financing current assets include commercial paper and factoring.

Chapter XV

Inventory Management

After reading this chapter, you will be conversant with:

- The Role of Inventory in Working Capital
- The Purpose of Inventories
- Types of Inventory and Costs Associated with it
- Inventory Management Techniques
- Inventory Planning
- Other Inventory Management Techniques
- Pricing of Inventories
- Inventory and Finance Manager

Introduction

Inventory Management involves the control of assets being produced for the purposes of sale in the normal course of the company's operations. Inventories include raw material inventory, work-in process inventory and finished goods inventory. The goal of effective inventory management is to minimize the total costs – direct and indirect – that are associated with holding inventories. However, the importance of inventory management to the company depends upon the extent of investment in inventory. It is industry-specific.

THE ROLE OF INVENTORY IN WORKING CAPITAL

Inventories are a component of the firm's working capital and, as such, represent a 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 to cash in the current accounting cycle, which is normally, one year. In some cases, this is not entirely true, for example, a vintner may require that the wine be aged in casks or bottles for many years. Or, a manufacturer of fine pianos may have a production process that exceeds one year. In spite of these and similar problems, we will view all inventories as being convertible into cash in a single year.

2. **Level of Liquidity:** Inventories are viewed as a source of near cash. For most products, this description is accurate. At the same time, most firms hold some slow-moving items that may not be sold for a long time. With economic slowdowns or changes in the market for goods, the prospects for sale of entire product lines may be diminished. In these cases, the liquidity aspects of inventories become highly important to the manager of working capital. At a minimum, the analyst must recognize that inventories are the least liquid of current assets. For firms with highly uncertain operating environments, the analyst must discount the liquidity value of inventories significantly.

3. **Liquidity Lags:** Inventories are tied to the firm's pool of working capital in a process that involves three specific lags, namely:

    a. *Creation Lag:* In most cases, inventories are purchased on credit, creating an account payable. When the raw materials are processed in the factory, the cash to pay production expenses is transferred at future times, perhaps a week, month, or more. Labor is paid on payday. The utility that provided the electricity for manufacturing is paid after it submits its bill. Or for goods purchased for resale, the firm may have 30 or more days to hold the goods before payment is due. Whether manufactured or purchased, the firm will hold inventories for a certain time period before payment is made. This liquidity lag offers a benefit to the firm.

    b. *Storage Lag:* Once goods are available for resale, they will not be immediately converted into cash. First, the item must be sold. Even when sales are moving briskly, a firm will hold inventory as a back-up. Thus, the firm will usually pay suppliers, workers, and 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 on credit and become accounts receivable. The firm must wait to collect its receivables. This lag also represents a cost to the firm.

4. **Circulating Activity:** Inventories are in a rotating pattern with other current assets. They get converted into receivables which generate cash and invested again in inventory to continue the operating cycle.

THE PURPOSE OF INVENTORIES

The purpose of holding inventories is to allow the firm to separate the processes of purchasing, manufacturing, and marketing of its primary products. The goal is to achieve efficiencies in areas where costs are involved and to achieve sales at competitive prices in the market place. Within this broad statement of purpose, we can identify specific benefits that accrue from holding inventories.

1. **Avoiding Lost Sales:** Without goods on hand which are ready to be sold, most firms would lose business. Some customers are willing to wait, particularly when an item must be made to order or is not widely available from competitors. In most cases, however, a firm must be prepared to deliver goods on demand. **Shelf stock** refers to items that are stored by the firm and sold with little or no modification 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 light industrial goods.

2. **Gaining Quantity Discounts:** In return for making bulk purchases, many suppliers will reduce the price of supplies and component parts. The willingness to place large orders may allow the firm to achieve discounts on regular prices. These discounts will reduce the cost of goods sold and increase the profits earned on a sale.

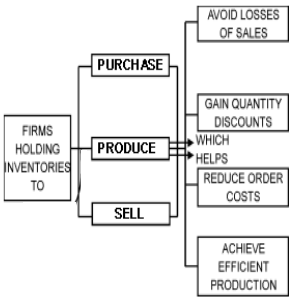
3. **Reducing Order Costs:** Each time a firm places an order, it incurs certain expenses. Forms have to be completed, approvals have to be obtained, and goods that arrive must be accepted, inspected, and counted. Later, an invoice must be processed and payment made. Each of these costs will vary with the number of orders placed. By placing fewer orders, the firm will pay less to process each order.

4. **Achieving Efficient Production Runs:** Each time a firm sets up workers and machines to produce an item, startup costs are incurred. These are then absorbed as production begins. The longer the run, the smaller the costs to begin production of the goods. As an example, suppose it costs Rs.12,000 to move machinery and begin an assembly line to produce electronic printers. If 1,200 printers are produced in a single three-day run, the cost of absorbing the startup expenses is Rs.10 per unit (12,000/1,200). If the run could be doubled to 2,400 units, the absorption cost would drop to Rs.5 per unit (12,000/2,400). Frequent setups produce high startup costs; longer runs involve lower costs.

   These benefits arise because 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. The sales force can respond to customer needs and demands based on existing finished products. To allow each area to function effectively, inventory separates the three functional areas and facilitates the interaction among them.

This role of inventory is diagrammed in Figure 15.1

Figure 15.1



5. **Reducing Risk of Production Shortages:** Manufacturing firms frequently produce goods with hundreds or even thousands of components. If any of these are missing, the entire production operation can be halted, with consequent heavy expenses. To avoid starting a production run and then discovering the shortage of a vital raw material or other component, the firm can maintain larger than needed inventories.

TYPES OF INVENTORY

Four kinds of inventories may be identified:

1. **Raw Materials Inventory:** This consists of basic materials that have not yet been committed to production in a manufacturing firm. Raw materials that are purchased from firms to be used in the firm's production operations 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 to uncouple the production function from the purchasing function so that delays in shipment of raw materials do not cause production delays.

2. **Stores and Spares:** This category includes those products which are accessories to the main products produced for the purpose of sale. Examples of stores and spares items are bolts, nuts, clamps, screws, etc. These spare parts are usually bought from outside or sometimes they are manufactured in the company also.

3. **Work-in-Process Inventory:** This category includes those 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.

   Its purpose is to uncouple the various operations in the production process so that machine failures and work stoppages in one operation will not affect the other operations.

4. **Finished Goods Inventory:** These are completed products awaiting sale. The purpose of a finished goods inventory is to uncouple the productions and sales functions so that it no longer is necessary to produce the goods before a sale can occur.

Table 15.1 provides the details of the investment in inventories in confectionery industry.

Table 15.1
Investment in Inventories

Types of Inventories Cadbury India Ltd.	Value in Rs. lakh	% in total Inventory
Raw Materials	715.01	27.50
Packing Materials	387.70	14.90
Work-in-Process	551.17	21.17
Finished Goods	937.38	36.00
Stores and Spare Parts	11.32	0.43
Total	2,602.58	100.00

Source: Official Directory of Bombay Stock Exchange

COSTS ASSOCIATED WITH INVENTORIES

The effective management of inventory involves a trade off between having too little and too much inventory. In achieving this trade off, the Finance Manager should realize that costs may be closely related. To examine inventory from the cost side, five categories of costs can be identified of which three are direct costs that are immediately connected to buying and holding goods and the last two are indirect costs which are losses of revenues that vary with differing inventory management decisions.

The five categories costs of holding inventories are:

Material Costs: These are the costs of purchasing the goods including transportation and handling costs.

Ordering Costs: Any manufacturing organization has to purchase materials. In that event, the ordering costs refer to the costs associated with the preparation of purchase requisition by the user department, preparation of purchase order and follow-up measures taken by the purchase department, transportation of materials ordered for, inspection and handling at the warehouse for storing. At times even demurrage charges for not lifting the goods in time are included as part of ordering costs. Sometimes, some of the components and/or material required for production may have facilities for manufacture internally. If it is found to be more economical to manufacture such items internally, then ordering costs refer to the costs associated with the preparation of requisition forms by the user department, set-up costs to be incurred by the manufacturing department and transport, inspection and handling at the warehouse of the user department. By and large, ordering costs remain more or less constant irrespective of the size of the order although transportation and inspection costs may vary to a certain extent depending upon order size. But this is not going to significantly affect the behavior of ordering costs. As ordering costs are considered invariant to the order size, the total ordering costs can be reduced by increasing the size of the orders. Suppose, the cost per order is Rs.100 and the company uses 1200 units of a material during the year. The size of the order and the total ordering costs to be incurred by the company are given below.

Size of order (units)	100	150	200
Number of orders in a year	12	8	6
Total ordering costs @ Rs.100 per order	Rs.1,200	Rs.800	Rs.600

From the above example, it can be easily seen that a company can reduce its total ordering costs by increasing the order size which in turn will reduce the number of orders. However, reduction in ordering costs is usually followed by an increase in carrying costs to be discussed now.

Carrying Costs: These are the expenses of storing goods. Once the goods have been accepted, they become part of the firm's inventories. These costs include insurance, rent/depreciation of warehouse, salaries of storekeeper, his assistants and security personnel, financing cost of money locked-up in inventories, obsolescence, spoilage and taxes. By and large, carrying costs are considered to be a given percentage of the value of inventory held in the warehouse, despite some fixed elements of costs which comprise only a small portion of total carrying costs. Approximately, carrying costs are considered to be around 25 percent of the value of inventory held in storage. The greater the investment in inventory, greater is the carrying costs. In the example considered in the case of ordering costs, let us assume that the price per unit of material is Rs.40 and that on an average about half-of the inventory will be held in storage. Then, the average values of inventory for sizes of

order 100, 150 and 200 along with carrying cost @ 25 percent of the inventory held in storage are given below.

Size of order (units):	100	150	200
Average value of inventory:	Rs.2,000	Rs.3,000	Rs.4,000
Carrying cost @ 25 percent of above:	Rs.500	Rs.750	Rs.1,000

From the above calculations, it can be easily seen that as the order size increases, the carrying cost also increasing in a directly proportionate manner.

Cost of Funds Tied up with Inventory: Whenever a firm commits its resources to inventory, it is using funds that otherwise might have been available for other purposes. The firm has lost the use of funds for other profit making purposes. This is its opportunity cost. Whatever the source of funds, inventory has a cost in terms of financial resources. Excess inventory represents unnecessary cost.

Cost of Running out of Goods: These are costs associated with the inability to provide materials to the production department and/or inability to provide finished goods to the marketing department as the requisite inventories are not available. In other words, the requisite items have run out of stock for want of timely replenishment. These costs have both quantitative and qualitative dimensions. These are, in the case of raw materials, the loss of production due to stoppage of work, the uneconomical prices associated with 'cash' purchases and the set-up costs which can be quantified in monetary terms with a reasonable degree of precision. As a consequence of this, the production department may not be able to reach its target in providing finished goods for sale. Its cost has qualitative dimensions as discussed below.

When marketing personnel are unable to honour their commitment to the customers in making finished goods available for sale, the sale may be lost. This can be quantified to a certain extent. However, the erosion of the good customer relations and the consequent damage done to the image and goodwill of the company fall into the qualitative dimension and elude quantification. Even if the stock-out cost cannot be fully quantified, a reasonable measure based on the loss of sales for want of finished goods inventory can be used with the understanding that the amount so measured cannot capture the qualitative aspects.

INVENTORY MANAGEMENT TECHNIQUES

As explained above, while the total ordering costs can be decreased by increasing the size of order, the carrying costs increase with the increase in order size indicating the need for a proper balancing of these two types of costs behaving in opposite directions with changes in order size.

Again, if a company wants to avert stock-out costs it may have to maintain larger inventories of materials and finished goods which will result in higher carrying costs. Here also proper balancing of the costs becomes important.

Thus, the importance of effective inventory management is directly related to the size of the investment in inventory. To manage its inventories effectively, a firm should use a systems approach to inventory management. A systems approach considers in a single model all the factors that affect the inventory.

A system for effective inventory management involves three subsystems namely economic order quantity, reorder point and stock level.

Economic Order Quantity

The economic order quantity (EOQ) refers to the optimal order size that will result in the lowest total of order and carrying costs for an item of inventory given its expected usage, carrying costs and ordering cost. By calculating an economic order quantity, the firm attempts to determine the order size that will minimize the total inventory costs.

Total inventory cost		=	Ordering cost + Carrying cost
Total ordering costs		=	Number of orders × Cost per order
		=	Rs. $\frac{U}{Q} \times F$
Where	U	=	Annual usage
	Q	=	Quantity ordered
	F	=	Fixed cost per order

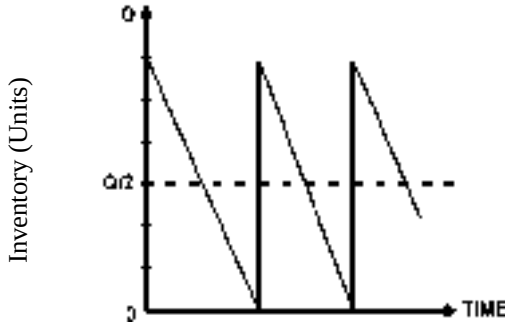
The total carrying costs = Average level of inventory x Price per unit x Carrying cost (percentage)

$\therefore$ Total carrying costs = Rs. $\frac{Q}{2} \times P \times C$ = Rs. $\frac{QPC}{2}$

Where	Q	=	Quantity ordered
	P	=	Purchase price per unit
	C	=	Carrying cost as %

As the lead time (i.e., time required for procurement of material) is assumed to be zero an order for replenishment is made when the inventory level reduces to zero. The level of inventory over time follows the pattern shown in figure 15.2:

Figure 15.2: Inventory Level and Order Point for Replenishment



From figure 15.2 it can be noticed that the level of inventory will be equal to the order quantity (Q units) to start with. It progressively declines (though in a discrete manner) to level O by the end of period 1. At that point an order for replenishment will be made for Q units. In view of zero lead time, the inventory level jumps to Q and a similar procedure occurs in the subsequent periods. As a result of this the average level of inventory will remain at (Q/2) units, the simple average of the two end points Q and Zero.

From the above discussion the average level of inventory is known to be (Q/2) units.

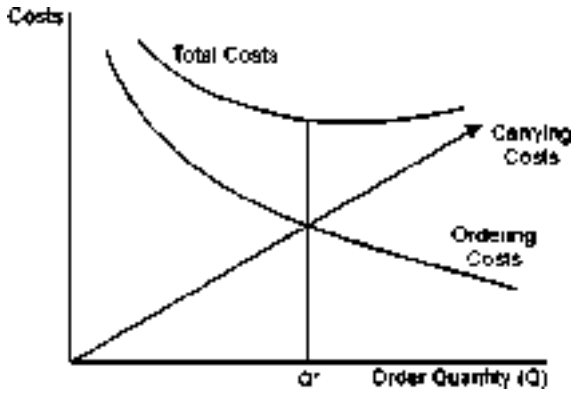
From the previous discussion, we know that as order quantity (Q) increases, the total ordering costs will decrease while the total carrying costs will increase.

The economic order quantity, denoted by Q_*, is that value at which the total cost of both ordering and carrying will be minimized. It should be noted that total costs associated with inventory

= Rs. $\frac{UF}{Q}$ + Rs. $\left(\frac{QPC}{2}\right)$

where the first expression of the equation represents the total ordering costs and the second expression the total carrying costs. The behavior of ordering costs, carrying costs and total costs for different levels of order Quantity (Q) is depicted in figure 15.3.

Figure 15.3: Behavior of costs associated with inventory for changes in order quantity



From figure 15.3, it can be seen that the total cost curve reaches its minimum at the point of intersection between the ordering costs curve and the carrying costs line. The value of Q corresponding to it will be the economic order quantity Q*. We can calculate the EOQ formula.

The order quantity Q becomes EOQ when the total ordering costs at Q is equal to the total carrying costs. Using the notation, it amounts to stating:

$$\frac{UF}{Q} = \frac{QPC}{2}$$

(i.e.) $2UF = Q^2 PC$

or $Q = \sqrt{\frac{2\,UF}{PC}}$ units

To distinguish EOQ from other order quantities, we can say

$$EOQ = Q^* = \sqrt{\frac{2\,UF}{PC}}$$

In the above formula, when 'U' is considered as the annual usage of material, the value of Q* indicates the size of the order to be placed for the material which minimizes the total inventory-related costs. When 'U' is considered as the annual demand Q* denotes the size of production run.

Suppose a firm expects a total demand for its product over the planning period to be 10,000 units, while the ordering cost per order is Rs.100 and the carrying cost per unit is Rs.2. Substituting these values,

$$EOQ = \sqrt{\frac{2 \times 10{,}000 \times 100}{2}} = 1{,}000 \text{ units}$$

Thus if the firm orders in 1,000 unit lot sizes, it will minimize its total inventory costs.

Examination of EOQ Assumptions

The major weaknesses of the EOQ model are associated with several of its assumptions, in spite of which the model tends to yield quite good results. Where

its assumptions have been dramatically violated, the EOQ model can generally be easily modified to accommodate the situation. The model's assumptions are as follows:

1. **Constant or uniform demand:** Although the EOQ model assumes constant demand, demand may vary from day-to-day. If demand is stochastic that is, not known in advance – the model must be modified through the inclusion of a safety stock.

2. **Constant unit price:** The EOQ formula derived is based on the assumption that the purchase price Rs.P per unit of material will remain unaltered irrespective of the order size. Quite often, bulk purchase discounts or quantity discounts are offered by suppliers to induce customers for buying in larger quantities.

   The inclusion of variable prices resulting from quantity discounts can be handled quite easily through a modification of the original EOQ model, redefining total costs and solving for the optimum order quantity.

3. **Constant carrying costs:** Unit carrying costs may vary substantially as the size of the inventory rises, perhaps decreasing because of economies of scale or storage efficiency or increasing as storage space runs out and new warehouses have to be rented. This situation can be handled through a modification in the original model similar to the one used for variable unit price.

4. **Constant ordering costs:** While this assumption is generally valid, its violation can be accommodated by modifying the original EOQ model in a manner similar to the one used for variable unit price.

5. **Instantaneous delivery:** If delivery is not instantaneous, which is generally the case, the original EOQ model must be modified by including of a safety stock.

6. **Independent orders:** If multiple orders result in cost savings by reducing paperwork and transportation cost, the original EOQ model must be further modified. While this modification is somewhat complicated, special EOQ models have been developed to deal with this.

These assumptions have been pointed out to illustrate the limitations of the basic EOQ model and the ways in which it can be easily modified to compensate for them. Moreover, an understanding of the limitations and assumptions of the EOQ model will provide the Finance Manager with a strong base for making inventory decisions.

INFLATION AND EOQ

Inflation affects the EOQ model in two major ways. First, while the EOQ model can be modified to assume constant price increases, many times major price increases occur only once or twice a year and are announced ahead of time. If this is the case, the EOQ model may lose its applicability and may be replaced with anticipatory buying – that is buying in anticipation of a price increase in order to secure the goods at a lower cost. Of course, as with most decisions, there are trade offs associated with anticipatory buying. The costs are the added carrying costs associated with the inventory that you would not normally be holding. The benefits of course, come from buying the inventory at a lower price. The second way inflation affects the EOQ model is through increased carrying costs. As inflation pushes interest rates up, the cost of carrying inventory increases. In the EOQ model this means that C increases, which results in a decline in the optimal economic order quantity.

Determination of Optimum Production Quantity: The EOQ Model can be extended to production runs to determine the optimum production quantity. The two costs involved in this process are: (i) set up cost and (ii) inventory carrying cost. The set-up cost is of the nature of fixed cost and is to be incurred at the time of commencement of each production run. The larger the size of the production run, the lower will be the set-up cost per unit. However, the carrying cost will increase with an increase in the size of the production run. Thus, there is an inverse relationship between the set-up cost and inventory carrying cost. The optimum production size is at that level where the total of the set-up cost and the inventory carrying cost is the minimum. In other words, at this level the two costs will be equal.

The formula for EOQ can also be used for determining the optimum production quantity as given below:

$$E = \sqrt{\frac{2U \times P}{S}}$$

Where E = Optimum production quantity

U = Annual (monthly) output

P = Set-up cost for each production run

S = Cost of carrying inventory per unit per annum (per month)

Illustration 15.1

Arvee Industries desires an annual output of 25,000 units. The set-up cost for each production run is Rs.80. The cost of carrying inventory per unit per annum is Rs.4. The optimum production quantity per production run (E) is

$$E = \sqrt{\frac{2U \times P}{S}}$$

$$= \sqrt{\frac{2 \times 25{,}000 \times 80}{4}}$$

$$= \frac{2{,}000}{2} = 1{,}000 \text{ units.}$$

Modified EOQ to include Varying Unit Prices: Bulk purchase discount is offered when the size of the order is at least equal to some minimum quantity specified by the supplier. The question may arise whether Q*, EOQ calculated on the basis of a price without discount will still remain valid even after reckoning with the discount. While no general answer can be given to such a question we can certainly say that a general approach using the EOQ framework will prove useful in decision-making – whether to avail oneself of the discount offered and if so what should be the optimal size of the order.

The procedure for such an approach is outlined below:

The first step under the general approach is to calculate Q*, EOQ without considering the discount. Let us suppose Q′ is the minimum order-size stipulated by the supplier for utilizing discount. After calculating Q* the same will be compared to Q′. Only three possibilities can arise out of the comparison.

In case Q* is greater than or equal to Q′, then Q* will remain valid even in the changed situation caused by the quantity discount offered. This is so because the company can avail itself of the benefit of quantity discount with an order-size of Q* as it is at least equal to Q′, the minimum stipulated order size for utilizing discount.

Only in the case of Q* being less than Q′ the need for the calculation of an optimal order size arises as the company cannot avail itself of the discount with the order size of Q*. An incremental analysis can be carried out to consider the financial consequences of availing oneself of discount by increasing the order-size to Q′. A decision to increase the order-size is warranted only when the incremental benefits exceed the incremental costs arising out of the increased order-size.

The incremental benefits will have two components: First, the total amount of discount available on the amount of material is to be used. If we assume Rs. D of discount per unit of material, then the total discount on the annual usage of material of U units amounts to:

Annual usage of materials in units x Discount per unit of material = Rs.UD

Secondly, with an increase in order-size from Q* to Q′, the number of orders will be reduced. As the ordering cost is assumed to be Rs.F per order irrespective of the order size, there will be a reduction in the total ordering cost. Thus, the reduction in ordering cost.

= (The difference between the number of orders with sizes of Q* and Q′) x (the cost per order of Rs. F)

$$= \text{Rs.} \left[\frac{U}{Q^*} - \frac{U}{Q'}\right] \text{x F}$$

Thus, the total incremental benefits will be the sum of the above two expressions and is given by

Total incremental benefits = Rs. UD + Rs. {U/Q* – U/Q′}x F

With an increase in the order-size, there is likely to be an increase in the average value of inventory even after reckoning with the discount per unit of material of Rs.D which will go to reduce the price per unit for the valuation of inventory. The increase in the average value of inventory will result in higher incidence of carrying cost, assumed to be C percent of the average value of inventory.

$$\text{Incremental carrying cost} = \frac{Q'(P-D)C}{2} - \frac{Q^*PC}{2}$$

The net incremental benefit can be obtained by subtracting the incremental carrying cost from the total incremental benefits. This is given by the expression.

Net incremental benefits

$$= \text{Rs. U x D} + \text{Rs.} \left(\frac{U}{Q^*} - \frac{U}{Q'}\right) F - \text{Rs.}\left[\frac{Q'(P-D)C - Q^*PC}{2}\right]$$

If the net incremental benefits are positive, then the optimal order quantity becomes Q′. Otherwise Q* will continue to remain valid even in a situation of bulk purchase discount. A numerical illustration is given below to illustrate the procedure to be adopted in a situation of bulk purchase discount.

Illustration 15.2

The annual usage of a raw material is 40,000 units for the Hy Fly Co., Ltd. The price of the raw material is Rs.50 per unit. The ordering cost is Rs.200 per order and the carrying cost 20 percent of the average value of inventory. The supplier has recently introduced a discount of 4 percent on the price of material for orders of 1,500 units and above. What was the company's E.O.Q. prior to the introduction of discount? Should the company opt for availing the discount? What would be the optimal order size if the company opts to avail for itself the discount offered?

Let us first arrange the data contained in the problem in accordance with the notation familiar to us by now.

U = 40,000 units

F = Rs.200 per order

P = Rs.50 per unit

D = Rs.2 per unit

C = 0.20

E.O.Q. without discount,

$$Q^* = \sqrt{\frac{2UF}{PC}}$$

$$= \sqrt{\frac{2\times 40{,}000\times 200}{50\times 0.2}}$$

= 1,265 units

For utilizing discount the minimum order size Q′ = 1,500 units. As Q* is less than Q′, we have to calculate the incremental benefits and incremental costs.

Total amount of discount available with an order size of 1,500 units.

= U x D = 40,000 units x Rs.2 per unit.

= Rs.80,000 .....(1)

Savings due to reduction in ordering costs

$$= \text{Rs.} \left(\frac{U}{Q^*} - \frac{U}{Q'}\right) \text{x F}$$

$$= \frac{40,000}{1265} - \frac{40,000}{1500}$$

= (32 – 27) x Rs.200

= Rs.1,000 .....(2)

Incremental carrying cost

$$= \frac{Q'(P-D)C}{2} - \frac{Q^* PC}{2}$$

$$= \frac{1{,}500 \text{ x } 48 \text{ x } 0.2}{2} - \frac{1{,}265 \text{ x } 50 \text{ x } 0.2}{2}$$

= Rs.7,200 – Rs.6,325

= Rs.875 .....(3)

Net incremental benefits (= 1 + 2 – 3)

= Rs.80,000 + Rs.1,000 – Rs.875 = Rs.80,125

As the net incremental benefits is a positive sum of Rs.80,125, the company should opt for availing the discount offered. The optimal order-size will be 1,500 units, the minimum order size required for availing of the discount.

From the illustration 15.2, it is clear that although EOQ value of 1,265 units (Q*) is not relevant in the present situation of bulk purchase discount, the general framework of the EOQ model has provided the necessary basis for subsequent calculations and the decision reached therefrom.

Reorder Point Subsystem

In the EOQ model discussed we have made the assumption that the lead time for procuring material is zero. Consequently, the reorder point for replenishment of stock occurs when the level of inventory drops down to zero. In view of instantaneous replenishment of stock, the level of inventory jumps to the original level from zero level. In real life situations one never encounters a zero lead time. There is always a time lag from the date of placing an order for material and the date on which materials are received. As a result the reorder level is always at a level higher than zero, and if the firm places the order when the inventory reaches the reorder point, the new goods will arrive before the firm runs out of goods to sell. The decision on how much stock to hold is generally referred to as the order point problem, that is, how low should the inventory be depleted before it is reordered.

The two factors that determine the appropriate order point are the procurement or delivery time stock which is the inventory needed during the lead time (i.e., the difference between the order date and the receipt of the inventory ordered) and the safety stock which is the minimum level of inventory that is held as a protection against shortages.

$\therefore$ Reorder Point = Normal consumption during lead time + Safety Stock.

Several factors determine how much the delivery time stock and safety stock should be held. In summary, the efficiency of a replenishment system affects amount of much delivery time needed. Since the delivery time stock is the expected inventory usage between ordering and receiving inventory, efficient replenishment of inventory would reduce the need for delivery time stock. And the determination of level of safety stock involves a basic trade-off between the risk of stock-out, resulting in possible customer dissatisfaction and lost sales, and the increased costs associated with carrying additional inventory.

Another method of calculating reorder level involves the calculation of usage rate per day, lead time which is the amount of time between placing an order and receiving the goods and the safety stock level expressed in terms of several days' sales.

Reorder level = Average daily usage rate x lead time in days.

From the above formula it can be easily deduced that an order for replenishment of materials be made when the level of inventory is just adequate to meet the needs of production during lead time.

If the average daily usage rate of a material is 50 units and the lead time is seven days, then

Reorder level = Average daily usage rate x Lead time in days

= 50 units x 7 days

= 350 units

When the inventory level reaches 350 units an order should be placed for material. By the time the inventory level reaches zero towards the end of the seventh day from placing the order, materials will reach and there is no cause for concern.

Safety Stock

Once again in real life situations one rarely comes across lead times and usage rates that are known with certainty. When usage rate and/or lead time vary, then the reorder level should naturally be at a level high enough to cater to the production needs during the procurement period and also to provide some measures of safety for at least partially neutralizing the degree of uncertainty.

The question will naturally arise as to the magnitude of safety stock. There is no specific answer to this question. However, it depends, *inter alia*, upon the degree of uncertainty surrounding the usage rate and lead time. It is possible to a certain extent to quantify the values that usage rate and lead time can take along with the

corresponding chances of occurrence, known as probabilities. These probabilities can be ascertained based on previous experiences and/or the judgemental ability of astute executives. Based on the above values and estimates of stock-out costs and carrying costs of inventory, it is possible to work out the total cost associated with different levels of safety stock.

Once we realize that higher the quantity of safety stock, lower will be the stock-out cost and higher will be the incidence of carrying costs, the formula for estimating the reorder level will call for a trade-off between stock-out costs and carrying costs. The reorder level will then become one at which the total stock-out costs (to be more precise, the expected stock-out costs) and the carrying costs will be at their its minimum. We consider below through an illustration the way of arriving at the reorder level in a situation where both usage rate and lead time are subject to variation.

Illustration 15.3

Below are presented the daily usage rate of a material and the lead time required to procure the material along with their respective probabilities (which are independent) for Sigma Company Ltd. The probabilities and the values of usage rate and lead time are based on optimistic, realistic and pessimistic perceptions of the executives concerned.

Average Daily Usage Rate (units)	Probability of Occurrence	Lead Time (No. of days)	Probability of Occurrence
200	0.25	12	0.25
500	0.50	16	0.50
800	0.25	20	0.25

The stock-out cost is estimated to be Rs.10 per unit while carrying cost for the period under consideration is Rs.3 per unit. What should be the reorder level based on financial considerations?

From the data contained in the table we can calculate the expected usage rate and expected lead time.

The expected usage rate is nothing but the weighted average daily usage rate, where the weights are taken to be the corresponding probability values. Thus, expected daily usage rate

= 200 x 0.25 + 500 x 0.5 + 800 x 0.25

= 50 + 250 + 200

= 500 units

Similarly expected lead time

= 12 x 0.25 + 16 x 0.5 + 20 x 0.25

= 3 + 8 + 5 = 16 days

Normal consumption during lead time can be obtained by multiplying the above two values.

(i.e.,) Normal consumption during lead time

= 500 units per day x 16 days = 8,000 units

Since normal consumption during lead time has been obtained as 8000 units, stock-outs can occur only if the consumption during lead time is more than 8,000 units.

Let us enumerate the situations with lead time consumption of more than 8,000 units, along with their respective probabilities of occurrence. This can be achieved by considering the possible levels of usage.

The possible levels of usage are:

Daily usage rate	Leadtime in days			Possible levels of usage	
Units	Probability	Units	Probability	Units	Probability
200	0.25	12	0.25	2400	0.0625
		16	0.50	3200	0.1250
		20	0.25	4000	0.0625
500	0.5	12	0.25	6000	0.1250
		16	0.50	8000	0.250
		20	0.25	10000	0.1250
800	0.25	12	0.25	9600	0.0625
		16	0.50	12800	0.1250
		20	0.25	16000	0.0625

From the above table it is clear that the situations with the lead time consumption of more than 8,000 units (normal usage) are 10,000 units with a probability of 0.1250, 9,600 units with 0.0625, 12,800 units with 0.1250 and 16,000 units with 0.0625 probability. And the levels of stock-out are 2,000 units, 1,600 units, 4,800 units and 8,000 units respectively.

Thus, safety stock level can be maintained at any of the above levels and the stock-out cost and carrying cost associated with these various levels are shown in the table.

Table 15.2
Levels of Safety Stocks and Associated Costs

Safety Stock (1)	Stockouts (2)	Probability (3)	Expected Stockout (4) = (2 x 3)	Expected Stockout Cost (5)	Carrying Cost (6)	Total Cost (7)
8,000 units	0	0	0	0	Rs. 24,000	Rs. 24,000
4,800 units	3,200 units	0.0625	200 units	Rs. 2,000	Rs. 14,400	Rs. 16,400
2,000 units	6,000 units	0.0625	375 units	Rs. 7,250	Rs. 6,000	Rs. 13,250
	2,800 units	0.1250	350 units			
			725 units			
1,600 units	6,400 units	0.0625	400 units	Rs. 8,500	Rs. 4,800	Rs. 13,300
	3,200 units	0.1250	400 units			
	400 units	0.1250	50 units			
			850 units			
0	8,000 units	0.0625	500 units	Rs.14,500	0	Rs. 14,500
	4,800 units	0.1250	600 units			
	2,000 units	0.1250	250 units			
	1,600 units	0.0625	100 units			
			1,450 units			

If the safety stock of the firm is 8,000 units, there is no chance of the firm being out of stock. The probability of stock-out is, therefore zero. If the safety stock of the firm is 4,800 units, there is 0.0625 chance that the firm will be short of inventory.

If the safety stock of the firm is 2,000 units, there is stock-out of 6,000 units with a probability of 0.0625 and 2,800 units with a probability of 0.125 based on the possible usage of 16,000 units with probability of 0.0625 and 12,800 with a probability of 0.125 stock-out and the probability of occurrence of stock-out at other levels are calculated in the same way.

Reorder Point Formula

Even in a relatively simple situation considered in the illustration above, the amount of calculations involved for arriving at the reorder level is large. In real life situations the assumption of independence in the probability distributions made in the illustration above may not be valid and the number of time periods may also be large. In such cases the approach adopted earlier can become much more complex. Therefore, one can adopt a much simpler formula which gives reasonably reliable results in calculating at what point in the level of inventory a reorder has to be placed for replenishment of stock. The formula along with its application is given below, using the notation developed earlier.

Reorder point = $S \times L + F \sqrt{(S \times R \times L)}$

Where,

S = Usage in units per day

L = Lead time in days

R = Average number of units per order

F = Stockout acceptance factor

The stock-out acceptance factor, 'F', depends on the stock-out percentage rate specified and the probability distribution of usage (which is assumed to follow a Poisson distribution). For any specified acceptable stockout percentage the value of 'F' can be obtained from the figure presented below.

Figure 15.4: Value of 'f' for different Stocks out percentage

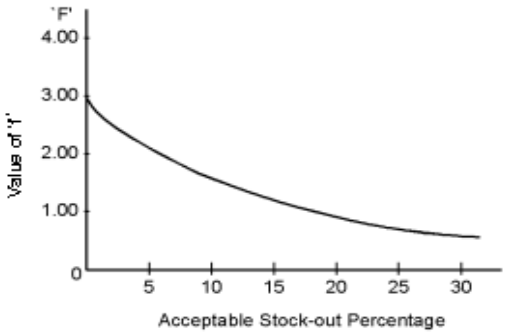


Illustration 15.4

For Apex company the average daily usage of a material is 100 units, lead time for procuring material is 20 days and the average number of units per order is 2000 units. The stockout acceptance factor is considered to be 1.3. What is the reorder level for the company?

From the data contained in the problem we have

S = 100 units

L = 20 days

R = 2,000 units

F = 1.3

Reorder level = $S \times L + F \sqrt{(S \times R \times L)}$

= $100 \times 20 + 1.3 \sqrt{(100 \times 2{,}000 \times 20)}$

= $2{,}000 + 1.3 \times 2{,}000 = 4{,}600$ units

Reorder for replenishment of stock should be placed when the inventory level reaches 4,600 units.

Stock-level Subsystem

This stock level subsystem keeps track of the goods held by the firm, the issuance of goods, and the arrival of orders. It maintains records of the current level of inventory. For any period of time, the current level is calculated by taking the beginning inventory, adding the inventory received, and subtracting the cost of goods sold. Whenever this subsystem reports that an item is at or below the reorder point level, the firm will begin to place an order for the item.

Total System

The three subsystems are tied together in a single inventory management system. The inventory management system can also be illustrated in terms of the three subsystems that comprise it. The figure No. 15.5 below ties each subsystem together and shows the three items of information needed for the decision to order additional inventory.

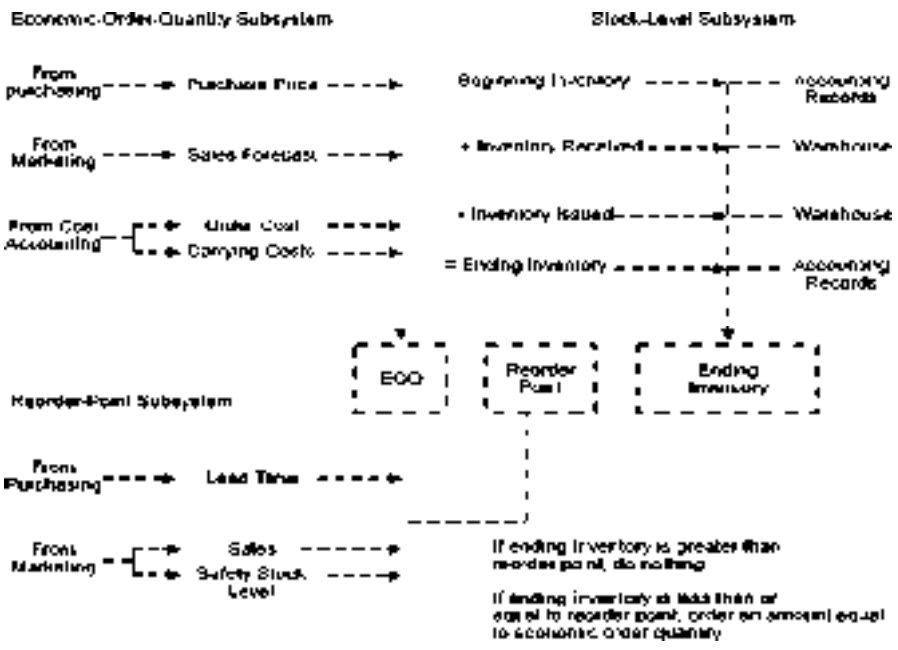
INVENTORY PLANNING

An important task of working-capital management is to ensure that inventories are incorporated into the firm's planning and budgeting process. Sometimes, the level of inventory reflects the orders received by the general manager of the plant without serious analysis as to the need for the materials or parts. This lack of planning can be costly for the firm, either because of the carrying and financing costs of excess inventory or the lost sales from inadequate inventory. The inventory requirements to support production and marketing should be incorporated into the firm's planning process in an orderly fashion.

The Production Side

The first step in inventory planning deals with the manufacturing mix of inventory items and end products. Every product is made up of a specified list of components. The analyst must recognize the different mix of components in each finished product. Each item maintained in inventory will have a cost. This cost may vary based on volume purchases, lead time for an order, historical agreements, or other factors. For the purpose of preparing a budget, each item must be assigned a unit cost.

Figure 15.5: Three Subsystems of the Inventory-Management System



Once the mix of components is known and each component has been assigned a value, the analyst can calculate the materials cost for each product which is the weighted average of the components and the individual products.

The Marketing Side

The second step in inventory planning involves a forecast of unit requirements during the future period. Both a sales forecast and an estimate of the safety level to support unexpected sales opportunities are required. The Marketing Department should also provide pricing information so that higher profit items receive more attention.

Inventory Data Base

An important component of inventory planning involves access to an inventory data base. A data base is a collection of data items arranged in files, fields and records. Essentially, we are working with a structured framework that contains the information needed to effectively manage all items of inventory, from raw materials to finished goods. This information includes the classification and amount of inventories, demand for the items, cost to the firm for each item, ordering costs, carrying costs, and other data.

The first component of an inventory data base deals with the movement of individual items and the second component of inventory management data involves information needed to make decisions on rendering or replenishing the items.

Conclusion

The task of inventory planning can be highly complex in manufacturing environments. At the same time, it rests on fundamental principles. The system used for inventory must tie into the operations of the firm. Inventory planning and management must be responsive to the needs of the firm. The firm should design systems, including reports, that allow it to make proper business decisions.

OTHER INVENTORY MANAGEMENT TECHNIQUES

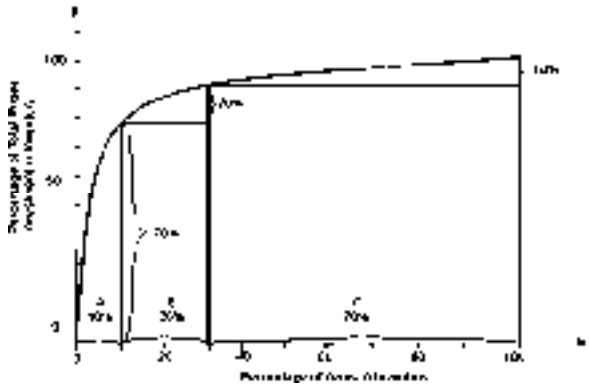
The ABC system

In the case of a manufacturing company of reasonable size the number of items of inventory runs into hundreds, if not more. From the point of view of monitoring information for control it becomes extremely difficult to consider each one of these items. The ABC analysis comes in quite handy and enables the management to concentrate attention and keep a close watch on a relatively less number of items which account for a high percentage of the value of annual usage of all items of inventory.

A firm using the ABC system segregates its inventory into three groups – A, B and C. The A items are those in which it has the largest rupee investment. In the Figure 15.6 which depicts the typical distribution of inventory items, A group consists about 10 percent of the inventory items that account approximately for 70 percent of the firm's rupee investment. These are the most costly or the slowest turning items of inventory. The B group consists of the items accounting for the next largest investment. This group consists approximately 20 percent of the items accounting for about 20 percent of the firm's rupee investment. The C group typically consists of a large number of items accounting for a small rupee investment. C group consists of approximately 70 percent of all the items of inventory but accounts for only about 10 percent of the firm's rupee investment. Items such as screws, nails, and washers would be in this group.

Dividing its inventory into A, B, and C items allows the firm to determine the level and types of inventory control procedures needed. Control of the A items should be most intensive due to the high rupee investments involved, while the B and C items would be subject to correspondingly less sophisticated control procedures.

Figure 15.6: Typical Distribution of Inventory Items – ABC System



The general procedure for categorization of items into 'A', 'B' and 'C' groups is briefly outlined below followed by an illustration.

- All the items of inventory are to be ranked in the descending order of their annual usage value.
- The cumulative totals of annual usage values of these items along with their percentages to the total annual usage value are to be noted alongside.
- The cumulative percentage of items to the total number of items is also to be recorded in another column.
- An approximate categorization of items into A, B, and C groups can be made by comparing the cumulative percentage of items with the cumulative percentage of the corresponding usage values.

Illustration 15.5

From the following details, draw a plan of ABC Selective Control.

Item	Units	Unit Cost
1.	7,000	5.00
2.	24,000	3.00
3.	1,500	10.00
4.	600	22.00
5.	38,000	1.50
6.	40,000	0.50
7.	60,000	0.20
8.	3,000	3.50
9.	300	8.00
10.	29,000	0.40
11.	11,500	7.10
12.	4,100	6.20

Solution

Ranking of Items According to their Usage Value

Item	Units	Unit Cost Rs.	Total Cost Rs.	% of Total cost	Ranking
1.	7,000	5.00	35,000	9.8	4
2.	24,000	3.00	72,000	20.2	2
3.	1,500	10.00	15,000	4.2	7
4.	600	22.00	13,200	3.7	8
5.	38,000	1.50	57,000	16.0	3

Item	Units	Unit Cost Rs.	Total Cost Rs.	% of Total cost	Ranking
6.	40,000	0.50	20,000	5.6	6
7.	60,000	0.20	12,000	3.4	9
8.	3,000	3.50	10,500	3.0	11
9.	300	8.00	2,400	0.7	12
10.	29,000	0.40	11,600	3.3	10
11.	11,500	7.10	81,650	23.0	1
12.	4,100	6.20	25,420	7.1	5
			3,55,770	100.0	

The advantages of this system are as follows:

i. It ensures closer control on costly items in which a large amount of capital has been invested.

ii. It helps in developing a scientific method of controlling inventories, Clerical costs are reduced and stock is maintained at optimum level.

iii. It helps in achieving the main objective of inventory control at minimum cost. The stock turnover rate can be maintained at comparatively higher level through scientific control of inventories.

The system of ABC analysis suffers from a serious limitation. The system analyzes the items according to their value and not according to their importance in the production process. It may, therefore, sometimes create difficult problems. For example, an item of inventory may not be very costly and hence it may have been put in category C. However, the item may be very important to the production process because of its scarcity. Such an item as a matter of fact requires the utmost attention of the management though it is not advisable to do so as per the system of ABC analysis. Hence, the system of ABC analysis should not be followed blindly.

The required plan of ABC selective control can now be drawn as:

Table 15.3: ABC Plan

Items in order of ranking	Item numbers	Percentage of total items	Value	Cumulative value	Cumulative percentage	Percentage of total value	Category
				Rs.			
1	3	25%	81,650	81,650	23.0	59.2%	A
2			72,000	1,53,650	43.2		
3			57,000	2,10,650	59.2		
4	4	33.3%	35,000	2,45,650	69.0	26.8%	B
5			25,420	2,71,070	76.2		
6			20,000	2,91,070	81.8		
7			15,000	3,06,070	86.0		
8	5	41.7%	13,200	3,19,270	89.7	14%	C
9			12,000	3,31,270	93.1		
10			11,600	3,42,870	96.4		
11			10,500	3,53,370	99.3		
12	–	–	2,400	3,55,770	100.0	–	
Total	12	100	3,55,770			100	

Monitoring of Stores and Spares

Just like ABC Analysis for classification of inventories, there is an inventory management technique called VED Analysis for monitoring and control of stores and spares inventory by classifying them into 3 categories viz., Vital, Essential and Desirable. The mechanics of VED analysis are similar to those of ABC Analysis.

PRICING OF INVENTORIES

There are different ways of valuing the inventories and a knowledge of these methods of valuing stocks is essential for an efficient inventory management process. The following methods can be adopted to value the raw material:

- First-In-First-Out (FIFO): When a firm adopts the FIFO method to price its raw material, the issue of material from the stores will be in the order which it was received. Thus the pricing will be based on the cost of material that was obtained first.
- Last-In-First-Out (LIFO): In the LIFO method, the material issued will be priced based on the material that has been purchased recently.
- Weighted Average Cost Method: The pricing of materials will be done on weighted average basis (weights will be given based on the quantity).
- Standard Price Method: Material is priced based on a standard cost which is predetermined. When the material is purchased the stock account will be debited with the standard price. The difference between the purchase price and the standard price will be carried into a variance account.
- Replacement/Current Price Method: In this method, material is priced at the value that is realizable at the time of the issue.

Illustration 15.6

The following information is extracted from the stores ledger of M/s Meena Ltd.

Material: X

Opening Stock: NIL

Purchases:

July 1	175 units @ Re.1 per unit
July 12	175 units @ Re.2 per unit
Issues:	
July 21	105 units
July 30	70 units

i. Complete the receipts and issues valuation by adopting the FIFO, LIFO and Weighted Average Method.

ii. If the standard price is Rs.1.25 per unit for the year and the replacement costs of the material on July 21 and July 30 are Rs.1.25 and Rs.1.75 respectively, then show the stock ledger account using the standard price method and the replacement price method.

The illustration has been solved in the following tables.

Valuation of Work-in-process and Finished Stock

The valuation of work-in-process and finished goods inventory depends to a certain extent on the method of pricing the raw material and to a large extent on the method of costing used to apportion the fixed manufacturing overheads. Direct Costing and Absorption Costing are the two techniques used for allocation of costs to the inventory.

Direct costing is based on the traceability of cost to the cost objective. All indirect costs (which may include fixed manufacturing overheads) are charged to the income statement and are known as period costs. If the fixed costs are directly identifiable, then it is considered for inventory valuation.

Absorption costing is a technique which treats the fixed manufacturing overheads as product costs. Thus, all costs i.e., both fixed and variable will be assigned to the inventory value.

This difference in approach to costing will affect the inventory value and also the profits. The direct costing method lowers the inventory value (by not considering the indirect costs) and increases profits with a decrease in inventory level (when the inventory level decreases the direct costs come down while the fixed costs remain the same). Contrary to this the inventory valuation will be higher for stocks valued under absorption costing method as it considers all the fixed manufacturing overheads.

i. Statement showing the valuation of raw material using FIFO, LIFO and Weighted Average Methods:

Stores Ledger A

					FIFO Method						LIFO Method						Weighted Average Method					
		Receipts			Issues			Balance			Issues			Balance			Issues			Balance		
Date	Particulars	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)
July 1	Purchases	175	1	175				175	1	175				175	1	175				175	1	175
July 12	Purchases	175	2	350				350	2	525				350	2	525				350	2	525
July 21	Issued				105	1	105	70	1	70	105	2	210	175	1	175	105	1.5*	157.5	245	1.5	367.5
								175	2	350				70	2	140						
July 30	Issued				70	1	70	175	2	350	70	2	140	175	1	175	70	1.5	105	140	1.5	262.50
					35	2	70	140	2	280	35	1	35	140	1	140						

$$\text{* Weight Average Rate} = \frac{175 \times 1 + 175 \times 2}{175 + 175} = 1.50$$

ii. Statement showing the valuation of stock using the standard price method and replacement method:

Stores Ledger Account

				Standard Price Method					Replacement Method				
	Receipts			Issues			Stock		Issues			Stock	
Date	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Value (Rs.)	Qty.	Rate (Rs.)	Value (Rs.)	Qty.	Value (Rs.)
July 1	175	1	175				175	175				175	175
July 12	175	2	350				350	525				350	525
July 21				105	1.15	120.75	245	404.25	105	1.25	131.25	245	393.75
July 30				70	1.15	80.50	175	323.75	70	1.75	122.75	175	271.25

INVENTORY AND THE FINANCE MANAGER

The inventory control methods described in this chapter give us a means for determining an optimal level of inventory, as well as how much should be ordered and when. These tools are necessary for managing inventory efficiently and balancing the advantages of additional inventory against the cost of carrying it. Computers have opened new vistas in inventory control, and operations research has many applications to inventory management – all beyond the scope of this chapter.

Although inventory management usually is not the direct operating responsibility of the finance manager, the investment of funds in inventory is an important aspect of financial management. Consequently, the finance manager must be familiar with ways to control inventories effectively, so that capital may be allocated efficiently. The greater the opportunity cost of funds invested in inventory, the

lower is the optimal level of average inventory and also the lower the optimal order quantity, all other things held constant. The EOQ model also can be useful to the finance manager in planning for inventory financing.

When demand or usage of inventory is uncertain, the finance manager may try to effect policies that will reduce the average lead time required to receive inventory, once an order is placed. The lower the average lead time, the lower is the safety stock needed and lower is the total investment in inventory, all other things held constant. The greater the opportunity cost of funds invested in inventory, the greater is the incentive to reduce this lead time. The purchasing department may try to find new vendors that promise quicker delivery, or it may pressure existing vendors to deliver faster. The production department may be able to deliver finished goods faster by producing a smaller run. In either case, there is trade off between the added cost involved in reducing the lead time and the opportunity cost of funds tied up in inventory.

The finance manager is also concerned with the risks involved in carrying inventory. The major risk is that the market value of specific inventories will be less than the value at which they were acquired. Certain types of inventory are subject to obsolescence, whether it be in technology or in consumer tastes. A change in technology may make an electronic component worthless. A change in style may cause a retailer to sell dresses at substantially reduced prices. Other inventories, such as agricultural products, are subject to physical deterioration. With deterioration, of course, inventories will have to be sold at lower and lower prices, all other things remaining the same. In other situations, the principal risk is that of fluctuations in market price. Some items of inventory, such as copper, are subject to rather wide price swings. The finance manager is perhaps the best person to make an objective analysis of the risks associated with the firm's investment in inventories. These risks must be considered in determining the appropriate level of inventory the firm should carry.

The opportunity cost of funds is the link by which the finance manager ties inventory management to the overall objective of the firm. In this regard, inventory can be treated as an asset to which capital is committed, as in any capital-budgeting project. Different items of inventory may involve different risks, and these differences can be incorporated into an analysis of risk similar to that for capital budgeting. Our discussion in this chapter has focused on determining an optimal level of investment. We know that greater the efficiency with which the firm manages its inventory, lower is the required investment and greater is the shareholder wealth, all other things remaining the same.

SUMMARY

- Inventory forms a substantial part of current assets for any manufacturing or trading organization and includes raw materials, stores and spares, work-in-progress and finished goods. Maintaining an inventory is absolutely essential for most companies for five main reasons: avoiding lost sales, gaining quantity discounts, reducing order costs, achieving efficient production runs and reducing the risk of production shortages.
- Inventory management comprises control of assets that are being produced for the purpose of sale. The objective of inventory management is to minimize total costs – both direct as well as indirect. The direct costs include material costs, ordering costs and carrying costs, while the indirect costs comprise the cost of funds tied up in inventory and the cost of running out of goods. While in increase an the size of the order can decrease the ordering costs, this will however increase the carrying costs. Therefore, a proper balance between the two is required to minimize the total costs of holding inventory. Economic order quantity is the optimal order size that will result in the lowest total ordering and carrying costs for a given usage level, and given ordering costs and carrying costs.

- Although inventory management usually is not the direct operating responsibility of the finance manager, the investment of funds in inventory is an important aspect of financial management. Consequently, the finance manager must be familiar with ways to control inventories effectively, so that capital may be allocated efficiently. The greater the opportunity cost of funds invested in inventory, the lower is the optimal level of average inventory and also the optimal order quantity, all other things held constant. The EOQ model while is also be useful to the finance manager planning for inventory financing.
- When demand or usage of inventory is uncertain, the finance manager may try to effect policies that will reduce the average lead time required to receive inventory, once an order is placed. The lower the average lead time, the lower is the safety stock needed and the lower is the total investment in inventory, all other things held constant. The greater the opportunity cost of funds invested in inventory, the greater is the incentive to reduce this lead time. The purchasing department may try to find new vendors that promise quicker delivery, or it may pressurize existing vendors to deliver faster. The production department may be able to deliver finished goods faster by producing a smaller run. In either case, there is a trade off between the added cost involved in reducing the lead time and the opportunity cost of funds tied up in inventory.
- The finance manager is also concerned with the risks involved in carrying inventory. The major risk is that the market value of specific inventories will be less than the value at which they were acquired. Certain types of inventory are subject to obsolescence, whether it be in technology or in consumer tastes. A change in technology may make an electronic component worthless. A change in style may cause a retailer to sell dresses at substantially reduced prices. Other inventories, such as agricultural products, are subject to physical deterioration. With deterioration, of course, inventories will have to be sold at lower and lower prices, all other things remaining the same. In other situations, the principal risk is that of fluctuations in market price. Some items of inventory, such as copper, are subject to rather wide price swings. The finance manager perhaps is the best person to make an objective analysis of the risks associated with the firm's investment in inventories. These risks must be considered in determining the appropriate level of inventory the firm should carry.

Chapter XVI

Receivables Management

After reading this chapter, you will be conversant with:

- Purpose and Cost of Maintaining Receivables
- The Impact of Credit Policy
- The Process of Credit Evaluation
- Decision Tree Approach
- Monitoring of Receivables

SECTION 1

Introduction

Business firms generally sell goods on credit, to facilitate sales especially from those customers who cannot borrow from other sources, or find it very expensive or difficult to do so.

Finished goods sold on credit get converted (from the point of view of the selling firm) into receivables (book debts) which when realized, generate cash. The average balance in the receivables account would approximately be: average daily credit sales multiplied by average collection period. For Illustration, if the average daily credit sales of a firm are Rs.3,00,000 and the average collection period is 40 days, the average balance in the receivables account would be Rs.1,20,00,000. Since receivables often account for a significant proportion of the total assets, management of receivables take up a lot of the Finance Manager's time.

PURPOSE OF RECEIVABLES

The purpose of receivables can be understood if we can grasp the basic objective of receivables management. The objective of receivables management is to promote sales and profits until that point is reached where the returns that the company gets from funding of receivables is less than the cost that the company has to incur in order to fund these receivables. Hence, the purpose of receivables is directly connected with the company's objectives of making credit sales, which are:

- To increase total sales; because when a company sells goods on credit, it will be in a position to sell more goods than if it insists on immediate cash payment.
- To increase profits; because this results in an increase in sales not only in volume, but also because companies charge a higher margin of profit on credit sales as compared to cash sales.
- To meet increasing competition; and for this the company may have to grant better credit facilities than those offered by its competitors.

COST OF MAINTAINING RECEIVABLES

- **Additional fund requirement for the company**

  When a firm maintains receivables, some of the firm's resources remain blocked in them because there is a time lag between the credit sale to customer and receipt of cash from them as payment. To the extent that the firm's resources are blocked in its receivables, it has to arrange additional finance to meet its own obligations towards its creditors and employees, like payments for purchases, salaries and other production and administrative expenses. Whether this additional finance is met from its own resources or from outside, it involves a cost to the firm in terms of interest (if financed from outside) or opportunity costs (if internal resources, they could have been put to some other use.)

- **Administrative costs**

  When a company maintains receivables, it has to incur additional administrative expenses in the form of salaries to clerks who maintain records of debtors, expenses on investigating the creditworthiness of debtors, etc.

- **Collection costs**

  These are costs which the firm has to incur for collection of the amounts at the appropriate time from the customers.

- **Defaulting costs**

  When customers make default in payments, not only is the collection effort to be increased but the firm may also have to incur losses from bad debts.

The size of receivables or investment in receivables is determined by the firm's credit policy and the level of its sales.

The following aspects of receivables management are discussed in this chapter:

- Formulation of credit policy.
- Credit evaluation.
- Credit granting decision.
- Monitoring receivables.

IMPACT OF CREDIT POLICY

The credit policy of a company can be regarded as a kind of trade-off between increased credit sales leading to increase in profit and the cost of having larger amount of cash locked up in the form of receivables and the loss due to the incidence of bad debts. In a competitive market, the credit policy adopted by a company is considerably influenced by the practices followed by the industry. A change in the credit policy of a company, say, by extending credit period to 30 days, when the other companies are following a credit period of 15 days can result in such a high demand for the company's product that it cannot cope with. Further, other companies also may have to fall in line in the long run. It is assumed generally that such factors have already been taken into consideration before making changes in the credit policy of a company.

The term credit policy encompasses the policy of a company in respect of the credit standards adopted, the period over which credit is extended to customers, any incentive in the form of cash discount offered, as also the period over which the discount can be utilized by the customers and the collection effort made by the company.

Thus, the various variables associated with credit policy are:

1. Credit standards
2. Credit period
3. Cash discount
4. Collection program.

All these variables underlying a company's credit policy influence sales, the amount locked up in the form of receivables and some of the receivables turning sour and eventually becoming bad debts. While the variables of credit policy are related to each other, for the purpose of clarity in understanding, we shall follow what is technically known as comparative static analysis by considering each variable independently, holding some or all others constant, to study the impact of a change in that variable on the company's profit. It is also assumed that the company is making profits and has adequate unutilized capacity to meet the increased sales caused by a change in some variables without incurring additional fixed costs like wages and salaries, rent, etc.

Credit Standards

When a company is confronted with the question of the standards to be applied to customers before deciding whether to extend credit or not, application of very stiff standards for the purpose is likely to result in a low level of sales, less amount of money locked up in the form of receivables, virtually no bad debt losses and less amount to be spent for collection. On the other hand, indiscriminate extension of credit without bothering much about the credit standards expected of the customers is likely to increase sales. But in its wake, the company is more likely to be saddled with a large quantum of money locked up in the form of accounts receivable, higher incidence of bad debt losses and increased expenses on the collection front. In the United States, there are excellent professional credit rating agencies such as Dun and Bradstreet whose services can be utilized for a consideration. In the Indian situation, no such reputed agencies exist except for credit rating of public issues. Let us assume for the time being (because we shall

consider these aspects in the section on credit evaluation) that the company has rated the customers into four categories ranging from 'high', 'good', 'fair' and 'limited' in the descending order of credit rating. Let us also assume that the company has been currently extending credit to only those customers rated as high and good. This way, the company has been foregoing sales from 'fair' and 'limited' categories. The company has been contemplating to increase its sales from its existing level by liberalizing or relaxing its credit standards to some extent. What course of action should it take – liberalize or not?

The answer to the above question lies in making a comparison of the incremental benefits associated with a liberalized policy and the associated incremental costs. The decision to liberalize will be justified only when the net incremental benefits are positive. Before going into the analysis we have to reckon with the factor that the existing and top-rated customers may take a lenient view in their paying habit once they come to know that the lowly rated customers of the company are taking a longer period for payment than what they themselves have been taking to pay. With a view to facilitate the exposition, it is assumed that the existing customers will not alter their paying habit even after liberalization of credit by the company (lest they be relegated to the lower rated groups) and the company can meet the increase in sales demand without incurring additional fixed costs as stated earlier on.

Let us now consider the items of incremental benefits and incremental costs[1] under the simplified assumptions. A numerical illustration will help in understanding the incremental cost benefit analysis.

Illustration 16.1

The existing sales of Laxmi company are Rs.2 crore. The current customers are drawn from companies having 'high' or 'good' credit rating. With partially liberalized credit standards the company's sales are likely to go up by Rs.24 lakh, the mix of new customers being 67 percent and 33 percent from the groups rated 'fair' and 'limited' respectively. The average collection period is likely to be 45 days and the incidence of bad debt losses 10 percent for the new customers. The contribution to sales ratio for Laxmi company is 20 percent and the cost of funds is 15 percent[2].

Additional profit from increased sales

$$= \text{Increase in sales revenues} \times \frac{\text{Contribution}}{\text{Sales revenue}}$$

$$= \text{Rs.}24,00,000 \times \frac{20}{100} = \text{Rs.}4,80,000 \qquad \text{.....(a)}$$

Additional receivables

$$= \frac{\text{Additional Sales Revenue}}{360 \text{ days}} \times \text{Collection Period}$$

$$= \frac{24,00,000}{360} \times 45 \text{ days} = \text{Rs.}3,00,000$$

---

1 Ignore Taxes

2 Under the assumption that fixed costs like salaries and wages, rent, etc. have already been recovered from existing sales, the total contribution on new sales will be the additional profit. Contribution is the difference between sales revenue and variable costs (like the cost of raw material). Thus contribution

$$\text{sales ratio} = \frac{\text{Total Contribution}}{\text{Sales Revenue}} = \frac{(\text{Sales Revenue} - \text{Variable Costs})}{\text{Sales Revenue}}$$

When fixed costs are already recovered, the additional contribution will be the profit and is given by Additional Sales Revenue x Contribution to Sales Ratio by the same token the variable costs to be incurred for additional sales

$$= \text{Sales revenue} \left(1 - \frac{\text{Contribution}}{\text{Sales revenue}}\right)$$

Additional investment in receivables

$$= \text{Amount of receivables} \times \frac{\text{Variable cost}}{\text{Sales revenue}}$$

$$= 3{,}00{,}000 \times \frac{80}{100} = \text{Rs.}2{,}40{,}000$$

Cost of financing the additional investment in receivables

$$= \text{Rs.}2{,}40{,}000 \times \frac{15}{100} = \text{Rs.}36{,}000 \qquad \text{.....(b)}$$

Total amount of bad debt losses

= New sales x Bad debt percentage

$$= \text{Rs.}24{,}00{,}000 \times \frac{10}{100} = \text{Rs.}2{,}40{,}000 \qquad \text{.....(c)}$$

We have now calculated the relevant amounts in terms of additional benefits and additional costs.

a. Additional profit on new sales = Rs.4,80,000

Additional Costs:

b. Cost of financing additional investment in receivables = Rs.36,000

c. Amount of bad debt losses on new sales = Rs.2,40,000

Total of additional costs (b + c) = Rs.2,76,000

Net additional benefit (a – b – c) = Rs.2,04,000

Since the net additional benefit is positive being Rs.2,04,000 liberalization of credit standards is to the advantage of the company and should, therefore, be followed.

The effect of relaxing the credit standards on profit may also be estimated by using the following formula.

$$\Delta P = \Delta S (1 - V) - k \Delta I - b_n \Delta S$$

where

ΔP = change in profit

ΔS = increase in sales

V = variable costs to sales ratio

k = cost of capital

ΔI = increase in receivables investment

$$= \frac{\Delta S}{360} \times \text{Average collection period (ACP)} \times V$$

b_n = bad debts loss ratio on new sales

$1 - V$ = contribution to sales ratio

Illustration 16.1 can be reworked by using the above equation to find out the effect of relaxing the credit standards on profit as follows:

$$\Delta P = 24{,}00{,}000 \times 0.2 - 0.15 \times \frac{24{,}00{,}000}{360} \times 45 \times 0.8$$

$$- 0.1 \times 24{,}00{,}000$$

$$= 4{,}80{,}000 - 36{,}000 - 2{,}40{,}000 = \text{Rs,}2{,}04{,}000$$

Credit Period

The credit period refers to the length of time allowed to customers to pay for their purchases. It generally varies from 15 days to 60 days. If a firm allows, say, 45 days of credit with no discount to induce early payment, its credit terms are stated as "net 45".

Lengthening of the credit period pushes sales up by inducing existing customers to purchase more and attracting additional customers, at the same time increasing receivables investment and incidence of bad debt loss. A shortening of credit period will tend to lower sales as customers decrease; reduce investment in receivables, and reduce the incidence of bad debt loss. Let us consider the impact of lengthening credit period by means of an illustration.

Illustration 16.2

Radha company's existing sales are Rs.180 lakh. It is currently extending a credit period of 'net 30 days' to its customers. The company's contribution to sales ratio is 20 percent and the cost of funds is 15 percent. The company is contemplating to increase its sales by Rs.16 lakh to be achieved by means of lengthening the existing period to 'net 45 days'. The bad debt losses on additional sales is expected to be 5 percent. Should the company go in for a policy change or not?

To answer the above question, we have to consider the incremental benefits and costs associated with the policy change and a favorable decision taken only if the incremental benefits exceed the incremental costs.

The calculation procedure is outlined below:

Additional profit arising out of new sales

$$= \text{Amount of additional sales} \times \frac{\text{Contribution}}{\text{Sales revenue}}$$

$$= \text{Rs.}16,00,000 \times \frac{20}{100} = \text{Rs.}3,20,000 \quad \text{....(a)}$$

As a result of elongation in the credit period, the existing customers will pay after 45 days, instead of 30 days.

Consequently the increase in receivables on existing sales will be

$$(45 - 30) \times \text{Rs.} \frac{1,80,00,000}{360} = \text{Rs.}7,50,000$$

As the increase in receivables is only on existing sales which have arisen because of lengthening credit period by 15 days, the full amount of Rs.7,50,000 will be regarded as investment in receivables.

The amount of receivables arising out of new sales

$$= \text{Amount of new sales} \times \frac{45}{360}$$

$$\text{or Rs.}16,00,000 \times \frac{45}{360} = \text{Rs.}2,00,000$$

The investment in receivables on new sales

$$= \text{Rs.}2,00,000 \times \frac{\text{Variable cost}}{\text{Sales revenue}}$$

$$= \text{Rs.}2,00,000 \times \frac{80}{100}$$

$$= \text{Rs.}1,60,000$$

The total amount of investment in receivables

$$= \text{Rs.}7,50,000 + \text{Rs.}1,60,000$$

$$= \text{Rs.}9,10,000$$

The cost of additional investment in receivables

$= \text{Rs.}9,10,000 \times \frac{15}{100}$

= Rs.1,36,500 .....(b)

The cost of bad debt losses on new sales

$= \text{Rs.}16,00,000 \times \frac{5}{100}$

= Rs.80,000 .....(c)

The amount of additional cost associated with increasing credit period
= (b) + (c) = Rs.1,36,500 + Rs.80,000 or Rs.2,16,500

The net additional benefit

= a – (b + c)

= Rs.3,20,000 – Rs.2,16,500 = Rs.1,03,500

As the net additional benefit is a positive amount of Rs.1,03,500 the policy change is beneficial to the company.

The effects of increasing the credit period are similar to that of relaxing credit standards and hence we can also estimate the effect on profit of change in credit period using the same formula.

$$\Delta P = \Delta S(1-V) - k\,\Delta I - b_n\,\Delta s$$

The components of the formula are same except

$$\Delta I = (ACP_N - ACP_O)\left[\frac{S_o}{360}\right] + V(ACP_N)\frac{\Delta S}{360}$$

Where

ΔI	= increase in investment
ACP_N	= new average credit period (after increasing credit period)
ACP_O	= old average credit period
V	= ratio of variable cost to sales
ΔS	= increase in sales

The above illustration can be worked out as follows:

$$\Delta P = \Delta S(1-V) - k\,\Delta I - b_n\,\Delta s$$

$$\Delta I = (ACP_N - ACP_0)\left[\frac{S_o}{360}\right] + V(ACP_N)\frac{\Delta S}{360}$$

$$= (45-30)\left[\frac{180}{360}\right] + 0.8 \times 45 \times \frac{16}{360}$$

= 7.5 + 1.6 = Rs.9.1 lakh

P = 16 (0.2) – 0.15 x 9.1 – 0.05 x 16

= 3.2 – 1.365 – 0.8

= Rs.1.035 lakh or Rs.1,03,500.

Cash Discount

Firms generally offer cash discounts to induce prompt payments. Credit terms reflect the percentage of discount and the period during which it is available. For example, credit terms of 1/20, net 30 mean that a discount of 1 percent is offered if the payment is made by the 20th day, otherwise the full payment is due by the 30th day.

A company which is not offering cash discount may introduce if later to induce prompt payment. Alternatively, a company which has already been offering an

incentive of say '1/10, net 30 days may further liberalize by either increasing the rate of discount and/or extending the period of discount. It may be noted that extending the period of discount will only result in customers' taking the discount at the end of the extended period and may not be very fruitful.

Even in the case of cash discount the incremental benefits arising out of additional sales and the reduction in the cost of funds locked up in the form of receivables have to be compared with the amount to be paid in the form of discount and a decision to provide/liberalize cash discount has to be taken only when the incremental net benefit is positive. The steps involved in the incremental analysis are illustrated by means of an illustration.

Illustration 16.3

Rama company is presently having sales of Rs.108 lakh. Its existing credit terms are 1/10, net 45 days and the average collection period is 30 days. Fifty percent of customers in terms of sales revenue are utilizing the cash discount incentive. The contribution to sales ratio of the company is 20 percent and cost of funds 15 percent. In order to hasten the collection process further as also to increase sales, if possible, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by Rs.3 lakh and average collection period to decline to 20 days. Eighty percent of customers in terms of sales revenue are expected to avail themselves of the cash discount under the liberalization scheme. Should the company increase its cash discount?

Let us consider the incremental benefits associated with the liberalization of credit terms. These are:

Profit associated with additional sales to be generated and cost savings on the release of funds locked up in receivables.

The incremental costs are:

The cost of funds invested in the receivables arising out of new sales. Additional amount to be paid as cash discount.

Profit to be generated by increase in sales

Amount of sales x $\frac{\text{Contribution}}{\text{Sales}}$

= Rs.3,00,000 x 0.2 or Rs.60,000 .....(a)

Existing cost of carrying receivables

$$= \frac{\text{Rs.1,08,00,000}}{360\,\text{days}} \text{ x 30 days x 0.15}$$

= Rs.1,35,000

Cost of carrying receivables after liberalization

$$= \frac{\text{Rs.1,08,00,000}}{360\,\text{days}} \text{ x 20 days x 0.15}$$

= Rs.90,000

Savings in the cost of carrying receivables

= Rs.1,35,000 – Rs.90,000 = Rs.45,000 .....(b)

Thus, incremental benefits

= a + b = Rs.60,000 + Rs.45,000

= Rs.1,05,000 .....(c)

The cost of funds invested in the receivables arising out of new sales

$$= \frac{\text{Rs.3,00,000}}{360\,\text{days}} \text{ x 20 days x 0.8 x 0.15}$$

= Rs.2,000 .....(d)

Amount of discount presently paid

$$= \text{Rs.}1,08,00,000 \times \frac{50}{100} \times \frac{1}{100} = \text{Rs.}54,000$$

Amount of discount payable after liberalization

$$= \text{Rs.}1,11,00,000 \times \frac{80}{100} \times \frac{2}{100} = 1,77,600$$

The additional amount of discount payable

$$= 1,77,600 - \text{Rs.}54,000 = 1,23,600 \quad \text{.....(e)}$$

Thus, incremental costs

$$= (d + e) = \text{Rs.}2,000 + \text{Rs.}1,23,600$$

$$= \text{Rs.}1,25,600 \quad \text{.....(f)}$$

A comparison of items (c) and (f), the total incremental benefits and incremental costs reveal that the net incremental benefit is

$$= \text{Rs.}1,05,000 - \text{Rs.}1,25,600 = -\text{Rs.}20,600$$

It is, therefore, not advisable to increase the rate of cash discount from 1 to 2 percent.

The effect of such an action on gross profit may be estimated by the following formula.

$$\Delta P = \Delta S (1 - V) + k \Delta I - \Delta DIS$$

where

ΔS = increase in sales

V = ratio of variable cost to sales

k = cost of capital

ΔI = savings in receivables management

$$= \frac{S_o}{360}(ACP_o - ACP_N) - V \frac{\Delta S}{360} ACP_N$$

ΔDIS = increase in discount cost

$$= p_n (S_o + \Delta S)\, d_n - p_o\, s_o\, d_o$$

where

p_n = proportion of discount sales after liberalizing

S_o = sales before liberalizing

ΔS = increase in sales

d_n = new discount percentage

p_o = proportion of discount sales before liberalizing

d_o = old discount percentage

The above illustration 3 can also be solved using the equation as follows:

$$\Delta P = \Delta S (1 - V) + k\ \Delta\ I - \Delta DIS$$

$$\Delta I = \frac{S_o}{360}(ACP_o - ACP_N) - V \frac{\Delta S}{360} ACP_N$$

$$= \frac{108}{360}(30 - 20) - 0.8 \times \frac{3}{360} \times 20 = \text{Rs.}2,86,667$$

$$\Delta DIS = p_n (S_o + \Delta S)\, d_n - p_O\, s_O\, d_O$$

$$= 0.8 \times 111 \times 0.02 - 0.5 \times 108 \times 0.01$$

$$= \text{Rs.}1,23,600$$

$$DP = 3,00,000\ (0.2) + 0.15 \times 2,86,667 - 1,23,600$$

$$= \text{Rs.}-20,600$$

Liberal cash discount policy involves increasing the discount percentage or lengthening the discount period. Such a policy tends to enhance sales (because the discount is regarded as price reduction), reduce the average collection period (as customers pay promptly), and increase the cost of discount.

Collection Program

The collection effort of a company is decided by the collection policy, which is a part of the overall credit policy of the company. The objective of collection policy is to achieve timely collection of receivables, thereby releasing funds locked up in receivables for a longer period than they should have been under the credit terms and to minimize bad debt losses.

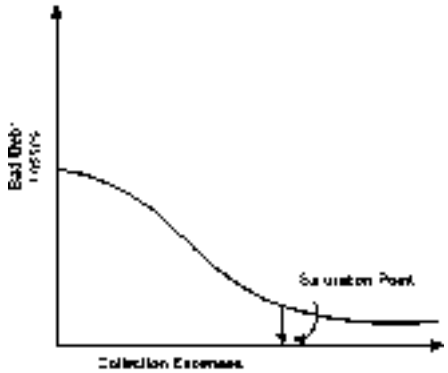
The collection program consists of the following.

- Monitoring the state of receivables
- Despatch of letters to customers whose due date is approaching
- Telegraphic and telephonic advice to customers around the due date
- Threat of legal action to overdue accounts
- Legal action against overdue accounts.

While formulating the collection policy a company should reckon with the factor that a very rigoros collection policy may act as an irritant to customers, thereby jeopardizing the good customer relations built over the years. Further, the sales of the company may decline as customers with some overdues may fear to place further orders. However, the amount of receivables and bad debt losses will reduce to a certain extent as the company increases the collection expense associated with collection programs.

The general pattern of the relationship between collection expenses incurred and bad debt losses will be such that initial increase may not have perceptible impact while subsequent amounts up to a certain level will have a pronounced impact in reducing bad debt losses. This is depicted in the form of a graph below. The amount of expenses incurred beyond the saturation point are likely to have very little impact on bad debt losses.

Figure 16.1: Behavior of bad debt losses/collection expenses



Similarly, deliberate laxity on the part of the company in the rigor of collection effort is likely to increase sales, increase average collection period, increase bad debt losses and to some extent reduce collection expenses.

Once again, the incremental financial benefits in the form of the cost of funds released by a reduction in the level of receivables and the reduction in bad debt losses have to be compared with the incremental costs associated with additional collection expenses; and policy change is warranted only when the incremental net benefits are positive. The following illustration is intended to illustrate the analytical approach to be adopted in taking decisions on collection effort.

Illustration 16.4

The present sales of PK Ltd. are Rs.108 lakh, the average collection period 60 days, bad debt losses 6 percent of sales and collection expenses Rs.1 lakh. The company's cost of funds is 15 percent. It is contemplating to increase the collection effort through special programs to reduce the amount of receivables and the incidence of bad debt losses. Two separate programs called A and B are under consideration. Program A is likely to reduce the average collection period to 45 days, decrease bad debt losses to 4 percent of sales and involve collection expenses of Rs.3 lakh. Program B is envisaged to reduce the average collection period to 30 days, decrease bad debt losses to 3 percent sales and involve collection expenses of Rs.5 lakh. On the assumption that sales are not likely to get affected, should the company go in for any of the programs under consideration?

Let us consider the incremental benefits and costs associated with each of the programs under consideration.

Relaxation of Collection Effort:
Incremental Costs and Benefits

	Present Program Rs.	Program A Rs.	Program B Rs.
1. Sales revenue	1,08,00,000	1,08,00,000	1,08,00,000
2. Average collection period	60 days	45 days	30 days
3. Accounts receivable	$\frac{1,08,00,000 \times 60}{360}$ = 18,00,000	$\frac{1,08,00,000 \times 45}{360}$ = 13,50,000	$\frac{1,08,00,000 \times 30}{360}$ = 9,00,000
4. Reduction in receivables from present level		4,50,000	9,00,000
5. Cost savings @ 15% on reduction in receivables		67,500	1,35,000
6. Bad Debt losses on sales	6%	4%	3%
7. Amount of bad debt losses	6,48,000	4,32,000	3,24,000
8. Reduction in bad-debt losses from present level		2,16,000	3,24,000
9. Incremental benefits of Program A due to cost savings and reduction in bad debt losses compared to Present Program (5 + 8)		2,83,500	4,59,000
10. Collection expenses	1,00,000	3,00,000	5,00,000
11. Incremental collection expenses from present level		2,00,000	4,00,000
12. Incremental net benefits (9 – 11)		83,500	59,000

From the calculations presented, it can be seen that the incremental net benefits associated with program A are Rs.83,500 while program B has resulted in an incremental net gain of Rs.59,000. It is, therefore, financially prudent to go in for program A instead of program B.

The effect of decreasing the rigor of collection program on profit may be estimated as:

$$\Delta P = \Delta S\ (1 - V) - k\ \Delta I - \Delta BD - \Delta C$$

Where,

ΔP = change in profits

ΔS = increase in sales

V = variable costs to sales ratio

k = cost of capital

ΔI = increase in investment in receivables

$$= \frac{S_o}{360}(ACP_N - ACP_0) + \frac{\Delta S}{360} ACP_N \times V$$

ΔBD = increase in bad debts cost

$= b_n (S_o + \Delta S) - b_o S_o$

ΔC = increase in collection expenses.

The illustration is reworked using the equation given above as follows:

Program A:

$\Delta P = \Delta S (1 - V) - \Delta BD - k \Delta I - \Delta C$

$\Delta BD = b_n (S_o + \Delta S) - b_o S_o$

$= 0.04 \times 108 - 0.06 \times 108$

$= -$ Rs.2.16 lakh

$$\Delta I = \frac{S_o}{360}(ACP_N - ACP_0) + \frac{\Delta S}{360} ACP_N \times V$$

As there is no change in sales

$$\Delta I = \frac{108}{360} \times (45 - 60) = -\text{Rs.4.5 lakh}$$

$\Delta C = 3 - 1 =$ Rs.2 lakh

$\Delta NP = 0 - (-2.16) - 0.15 (-4.5) - 2$

= Rs.83,500

Program B:

$\Delta BD = (0.03 - 0.06) 108$

$= -$ Rs.3.24 lakh

$$\Delta I = \frac{108}{360} \times (30 - 60) = -\text{Rs.9 lakh}$$

$\Delta C = 5 - 1 =$ Rs.4 lakh

$\Delta P = 0 + 3.24 + 9 \times 0.15 - 4$

= Rs.59,000

At times a company may tend to relax the rigor of its collection effort deliberately with a view to increasing its sales. This practice is not usually followed as it is likely to increase the average collection period and bad debt losses. There may be a marginal decrease in collection expenses. Here also a consideration of the incremental benefits and incremental costs helps in decision-making as the following illustration illustrates.

Illustration 16.5

Alpha company is contemplating to relax its collection effort with a view to increase its sales. Its existing sales are Rs.240 lakh, average collection period 30 days, bad debt losses 5 percent of sales, contribution to sales ratio 20 percent and

cost of funds 15 percent. After relaxing the collection effort sales are expected to increase by Rs.60 lakh. Average collection period is increased to 60 days. Bad debt losses rose to 7 percent. Should the company go in for relaxing its collection effort?

Let us work out the incremental benefits and incremental costs associated with the contemplated decision.

Increase in profit due to increase in sales

= Rs.60,00,000 x 0.2

= Rs.12,00,000 ....(a)

Existing amount of receivables

$$= \frac{\text{Rs.2,40,00,000}}{360} \text{ x } 30 = \text{ Rs.20,00,000}$$

Amount of receivables on existing sales after relaxation

$$= \frac{\text{Rs.2,40,00,000}}{360} \text{ x } 60 = \text{ Rs.40,00,000}$$

Increase in the investment in receivables on existing sales

= Rs.40,00,000 – Rs.20,00,000

= Rs.20,00,000 ....(b)

Amount of receivables on additional sales

$$= \frac{\text{Rs.60,00,000}}{360} \text{ x } 60 = \text{Rs.10,00,000}$$

Investment in the receivables on additional sales

= Rs.10,00,000 x 0.8

= Rs.8,00,000 ....(c)

Incremental investment in receivables

(b) + (c) = Rs.28,00,000

Cost of financing additional investment in receivables @ 15%

= Rs.28,00,000 x 0.15

= Rs.4,20,000 ....(d)

Existing bad debt losses

= Rs.2,40,00,000 x 0.05 = Rs.12,00,000

Bad debt losses after relaxation

= Rs.3,00,00,000 x 0.07 = Rs.21,00,000

Increase in bad debt losses

= Rs.21,00,000 – Rs.12,00,000

= Rs.9,00,000 ....(e)

Incremental costs (d) + (e) = Rs.13,20,000

Net incremental benefits a – (d + e)

= Rs.12,00,000 – Rs.13,20,000 = – Rs.1,20,000

As the contemplated relaxation results in a net incremental loss of Rs.1,20,000, it is not financially prudent to relax the collection effort by the company.

SECTION 2

THE PROCESS OF CREDIT EVALUATION

Before granting credit to a customer, a firm seeks information of the creditworthiness of that customer. In judging the creditworthiness of an applicant, three basic factors – the three Cs have to be considered. And they are – character, capacity, and collateral. Character refers to the willingness of the customer to honor his obligations. It reflects integrity, a moral attribute, considered very important by credit managers. Capacity refers to the ability of the customer to pay on time. It depends on the financial situation (particularly the working capital position and profitability) and the general business conditions affecting the performance of the customer. Collateral represents the security offered by the firm in the form of mortgages.

Credit evaluation of the prospective customer involves obtaining information from which the financial capacity as also the paying habits can be evaluated. It should, however, be noted that the procedure of evaluation is related to the amount or order likely to be placed by the prospective customer and the cost of obtaining information. If evaluating the information gathered is likely to exceed the profit generated by the order, then a detailed evaluation is not warranted. Further, the evaluation procedure should not be lengthy and time consuming. In a competitive market by the time the evaluation is completed, the prospective customer may have been 'snatched away' by one of the competitors in the market. The absence of reputed professional credit-rating agencies makes the task of credit-evaluation more difficult in India. However, some of the relevant information can be gathered from the financial statements.

The annual reports of a company provide considerable information in the form of balance sheets and profit and loss accounts besides detailed notes and the auditors' report. The prospective customer company's audited annual reports over the past three or four years can be sought. In case, the company declines to oblige, that in itself can arouse suspicion about the creditworthiness of the company.

When the financial statements are obtained, the financial strengths and weaknesses can be gauged by the application of ratio analysis. Some of the important ratios are briefly mentioned below.

a. $\text{Current ratio} = \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

b. $\text{Quick ratio} = \dfrac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$

The above two ratios are widely used to assess the liquidity position of a company in meeting its short-term obligations. These can be supplemented with other ratios.

c. Average payment period

$$= \frac{\text{Average Balance of Sundry Creditors}}{\text{Average Daily (Credit) Purchases}}$$

d. Average collection period

$$= \frac{\text{Average Balance of Sundry Debtors}}{\text{Average Daily (Credit) Sales}}$$

e. Capital structure ratio

$$= \frac{\text{Debt}}{\text{Equity}} \quad \text{(also called Debt – Equity Ratio)}$$

f. Return on equity

$$= \frac{\text{Net profit after tax and preference share dividend}}{\text{Owners' equity}}$$

The ratios mentioned above will indicate the payment period, collection periods of the company, and return on owner's equity. When calculated for three or four consecutive years in the recent past, the ratios will throw adequate light on the financial strength of the company and whether the trend over the years is favorable or not.

In addition to ratio analysis, an idea of changes in the funds position can be obtained by preparing funds flow statements, even if they are sketchy.

Obtaining Bank References

The prospective customers' bank must be having a lot of information obtained in the normal course for granting cash credit/overdraft facility. However, it may not be advisable to directly approach the customer's bank for information and rely on the bank's own assessment of the customer, as the bankers are generally reluctant to part with 'confidential' information about their client. It will be embarrassing to ask the prospective customer to issue a letter to its bank for furnishing such information which is considered to be important. A better course of action is to obtain information through the company's bank from the customer's bank. This approach can provide useful information needed to assess the financial strength of the customer.

Firm's Experience

If the firm has had previous dealings with the customers, it can judge the customer's creditworthiness by the latter's promptness in payments in the past. If the customer is approached for the first time, the company salesman's opinion about the customer's integrity is important.

Numerical Credit Scoring

A numerical credit index based on several factors is framed to study the creditworthiness of a customer. For example, any firm selling consumer durables on installments may determine the numerical credit index of its customers as follows:

Credit Index = W_1 Income level + W_2 Years of residence in the present place + W_3 Number of dependents.

The credit index is simply a weighted sum of facts which ostensibly has a bearing on creditworthiness. In the above case, W_1 and W_2 would be positive and W_3 would be negative.

From the information obtained, a quantitative evaluation can be made using the techniques of ratio and funds flow analysis of the customer's financial statements as also a qualitative evaluation as to the character of the customer. In the light of evaluation, the standing of the prospective customer vis-à-vis the existing standards followed by the company can be made. For convenience sake a format of the credit evaluation report is presented in Table 16.1.

Table 16.1

Credit Evaluation Report on X Co. Ltd.

Item Head	For X Co. Ltd.	Standard	Remarks
Current Ratio	1.70	1.75	Liquidity position is
Quick Ratio	1.15	1.00	Good
Average Payment Period	45 days	40 days	Can be persuaded to pay within 40 days
Average Collection Period	40 days	30 days	This may have caused delay in payments
Debt-Equity Ratio	1.5:1	2:1	Lower because of Capital Structure
Return on Equity	15%	18%	

Paying Habit: Good (Usually prompt; deviation occured only once 2 years back when there was a fire in the godown).

Integrity & Honesty: Good (As from the statements of other suppliers).

Based on the above evaluation, customers may be classified into various risk categories. A simple risk classification scheme is shown in the Table 16.2.

Table 16.2

Risk Classification Scheme

Risk class	Description
1.	Customers with no risk of default
2.	Customers with negligible risk of default (default rate less than 2 percent)
3.	Customers with a little risk of default (default rate between 2 and 5 percent)
4.	Customers with some risk of default (default rate between 5 and 10 percent)
5.	Customers with significant risk of default (default rate in excess of 10 percent)

SECTION 3

DECISION-TREE APPROACH

Credit evaluation, discussed earlier, attempts to formalize the procedure to gauge the creditworthiness of a prospective customer. It is a precursor to the final decision whether to grant credit to the prospective customer or not as it provides the decision-maker with necessary input data for decision-making. However, the decision whether to grant credit or not depends on the cost benefit analysis. If the customer pays, the company will make profit on the sale and if he fails to do so then the amount of cost gone into the product will be lost by the company. An astute manager, more often than not, can form a subjective opinion based on credit evaluation about the chance of getting payment and the chance of not getting the payment. The relative chances of getting the payment or not is at the back of his mind while taking a decision. The feeling can perhaps be translated into numerical figures such as there is a nine-in-ten chance that the payment will be made while the chance of the account turning into a bad debt is one-in-ten. Once, these relative chances are expressed in the above terms one can say that the probability of getting payment is 0.9 and the probability of not getting the payment is 0.1. It is then possible to obtain the financial consequences of granting credit as a weighted average of the profit to be obtained and the loss to be sustained where the weights are the respective probabilities. If the weighted average is positive, it can be concluded that the weighted benefits exceed the weighted loss, and hence it is prudent to grant credit; otherwise not. It should be noted that the probabilities are always non-negative and add up to unity. The process of credit granting decision is illustrated by means of numerical examples.

Illustration 16.6

The Rex company is considering whether to grant credit to a prospective customer or not. A close scrutiny of the credit evaluation made by the credit manager reveals that there is going to be nine-in-ten chance of payment being made and one-in-ten chance of non-payment. The revenue from the order is going to be Rs.80,000 whose cost is Rs.60,000. Should credit be granted to the customer?

On the basis of above information, the financial consequences of granting credit can be summarized as follows:

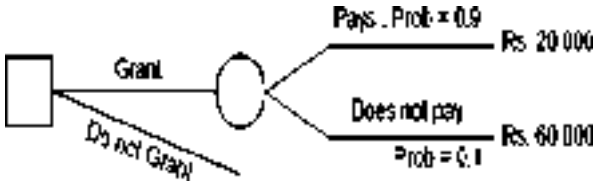
Revenue from the order = Rs.80,000

Cost of the order = Rs.60,000

Financial benefit or profit from the order = Rs.20,000

Thus, if the customer pays, the company gets a profit of Rs.20,000 while it loses Rs.60,000 if he fails to pay. The benefit and cost associated with granting credit along with their respective probabilities are depicted below in the form of a decision-tree for visual impact. It may be noted that a square represents a decision point and a circle, a chance event.

Figure 16.2: Credit granting decision: Decision tree approach (Single Order)



The weighted net benefit is Rs.20,000 x 0.9 – Rs.60,000 x 0.1 or Rs.12,000. Hence, it is preferable to grant credit as the weighted net benefit is positive.

The above problem can also be solved in the following way:

The expected profit for the action 'offer credit' is

p(REV – cost) – (1 – p) cost

where p is the probability that the customer pays his dues, (1 – p) is the probability that the customer defaults, REV is the revenue from sale, COST is the cost of goods sold.

The expected profit in the above illustration is

0.9 (80,000 – 60,000) – 0.1 (60,000) = Rs.12,000.

The expected profit for the action 'refuse credit' is 0. Obviously, the expected profit from the course of action 'offer credit' is positive, i.e. Rs.12,000 it is desirable to extend credit.

Illustration 16.7

Sunshine Industries is considering offering credit to a customer. The probability that the customer would pay is 0.5 and the probability that the customer would default is 0.5. The revenues from the sale would be Rs.2,500, and the cost of sale would be Rs.1,700.

The expected profit from offering credit, given the above information, is:

0.5(2,500 – 1,700) – 0.5(1,700) = – Rs.450

As this is negative the company cannot offer credit.

Repeat Order Situation

Generally, the sales order from a customer is not going to be a single order as considered earlier. The customer, once granted credit, is likely to place repeat orders and the company will be favorably inclined to oblige the customer provided he made timely payment for the first shipment. In case there is a repeat order the chance of not paying will become less than in the case of single order. Consequently, the net benefits to the company accruing from both the orders will be higher than two separate single orders. This is highlighted by an illustration.

Illustration 16.8

X Company Ltd. is considering whether to grant credit to a prospective customer who is likely to place a repeat order for the same quantity. Initially the probability of payment is considered to be 0.9 and that of default 0.1. In case the customer pays for the first order the probability of default for the repeat order is likely to be 0.05 while that of payment increases to 0.95. The revenue from each order is going to be Rs.1 lakh and the associated cost Rs.70,000, leaving a profit of Rs.30,000 if payment is made and a loss of Rs.70,000 if payment is not made.

The financial consequences of the first order are a profit of Rs.30,000 with a probability of 0.9 and a loss of Rs.70,000 with a probability of 0.1. Given that the customer has paid with 0.9 probability for the first order, the financial consequences of the second order will be Rs.30,000 with a probability of 0.95 and a loss of Rs.70,000 with a probability of 0.05. These can be visualized better when presented in the form of a decision-tree.

The net weighted financial benefit in the above situation can be calculated in two steps.

a. The net weighted financial benefit on the initial order is calculated in the same way as in the case of a single order (i.e.)

   0.9 x Rs.30,000 – 0.1 x Rs.70,000 or

   Rs.27,000 – Rs.7,000 = Rs.20,000

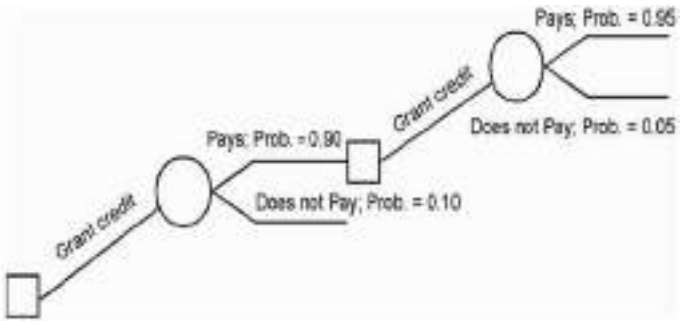
b. Given that the first order is paid with a probability of 0.9, the net weighted benefit from the repeat order will be

   0.9 [0.95 x Rs.30,000 – 0.05 x Rs.70,000]
   = 0.9 [Rs.28,500 – Rs.3,500]
   = 0.9 (Rs.25,000) or Rs.22,500.

The multiplication with 0.9 is necessitated by the fact that credit granting for repeat order is conditional upon the payment of first order whose probability is 0.9. Combining (a) and (b), the net weighted financial benefit is an amount of Rs.42,500 which is higher than two separate individual orders for the same amount with probabilities 0.9 and 0.1 for payment and default respectively.

The decision tree approach has greater visual impact. However, as the number of chance events, decision points and branches indicating alternatives increase, it becomes quite unwieldy. One may, then, tend to miss the 'decision woods' for the 'decision trees'.

Figure 16.3: Credit granting decision: Decision-tree approach (Separate order)



SECTION 4

MONITORING OF RECEIVABLES

An important aspect of receivables management is to monitor the payment of receivables. Several measures can be employed by the credit manager for this purpose like (i) Days Sales Outstanding, (ii) Ageing Schedule, and (iii) Collection Matrix are some of the measures employed.

The average collection period is based on year-end balance of receivables. For the purpose of internal control, monitoring has to be made more frequently. Further, year-end balance can be misleading when the sales are subject to seasonality or have grown towards the end of the year. For this reason two approaches, viz, 'days' sales outstanding' and 'aging schedule of receivables' are followed for control purpose. These are described below.

Days Sales Outstanding

The average number of days' sales outstanding at any time, say end of the month or end of the quarter, is obtained by following the formula which is not very different from the usual formula for average collection period:– Day's sales outstanding

$$= \frac{\text{Accounts receivable at time chosen}}{\text{Average daily sales}}$$

To illustrate the calculation of this measure, consider the monthly sales and month-end accounts receivable for a product line as given in the table 16.3 below.

Table 16.3

Sales and Receivables Data

Month	Sales	Receivable	Month	Sales	Receivables
January	200	460	July	200	340
February	225	360	August	200	360
March	230	315	September	220	360
April	150	310	October	230	390
May	150	300	November	245	500
June	180	320	December	250	520

If the average collection period is calculated at the end of each quarter, we get the following picture.

Quarter	Average Collection Period
First	$\frac{315}{(200+225+230)\div 90} = 43$ days
Second	$\frac{320}{(150+150+180)\div 91} = 61$ days
Third	$\frac{360}{(200+200+220)\div 92} = 53$ days
Fourth	$\frac{520}{(230+245+250)\div 92} = 66$ days

In case, the daily sales outstanding is within a pre-specified norm linked to the credit period followed by the company then the status of receivables is regarded to be under control. In case it is found to be higher, then the collection policy has to be strengthened as the collections are slow.

Ageing Schedule

The age-wise distribution of accounts receivable at a given time is depicted in the ageing schedule. For Illustration, the ageing schedule at the end of various quarters may be as follows:

Table 16.4

Outstanding Accounts Receivable

Age	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
0-30 days	40%	42%	44%	46%
31-60	30%	28%	26%	25%
61-90	20%	22%	25%	23%
120	10%	8%	5%	6%

A comparison of ageing schedules at periodic intervals help to identify changes in the payment behavior of customers.

The ageing schedule can be compared with the credit period extended by the company. When the percentage of receivables belonging to higher age groups is above a stipulated norm, action has to be initiated before they turn into bad debts. If the company's credit terms are say 'net sixty days', then control needs to be exercised in the form of follow-up measures in respect of the bottom 20 percent accounts.

The average collection period and the ageing schedule have traditionally been popular measures for monitoring receivables. However, they suffer from a limitation. They are influenced by the sales pattern as well as the payment behaviors of the customers. If sales are decreasing, average collection period and the ageing schedule will differ from what they would be if sales are constant. This holds even when the payment behavior of customers remains unchanged. The reason is simple: a greater portion of sales is billed currently. Similarly, decreasing sales lead to the same results. The reason here is that a smaller portion of sales is billed currently. It can be explained well with an illustration.

Illustration 16.9

Presented below are the monthly sales of ABC Company Ltd. for the period April to December with quarterly break-up. Collections are made at the rate of ten percent during the month of sales followed by 50 percent, 30 percent and 10 percent during the three succeeding months. Consequently the receivables balance at the end of a quarter will be the sum of ten percent of the sales of first month, 40 percent of the sales of second month and 90 percent of the sales of the third month. The daily sales are calculated by considering a period of 30 days, 60 days and 90 days. The end of quarter receivables, the DSO and the behavior of Ageing Schedule at the end of the quarter, for the three periods chosen for averaging, are calculated by using the formula stated earlier.

The daily sales with an average period of 30 days is obtained by dividing the sale of the most recent month i.e., during the second quarter for a 30 day average period daily sales of Rs.3,000 are calculated by dividing Rs.90,000 (sale of the most recent month i.e. September) by 30. For a 60 day average period during the same quarter daily sales are Rs.2,500 [i.e., (90,000 + 60,000)/60].

Table 16.5

Behavior of Ageing Schedule

Month	Sales	End of quarter receivables	Age group	Percent of total	Daily sales if average period is			DSO if average period is		
	(Rs. '000)	(Rs.'000)	(Days)		30 days	60 days (Rs.'000)	90 days (Rs.'000)	30 days (Rs.'000)	60 days (Rs.'000)	90 days (Rs.'000)
April	60	6	61-90	7.1						
May	60	24	31-60	28.6						
June	60	54	0-30	64.3						
		84		100	2	2.0	2	42	42	42
July	30	3	61-90	2.8						
August	60	24	31-60	22.2						
September	90	81	0-30	75.0						
		108		100.0	3	2.5	2	36	43	54
October	90	9	61-90	15.0						
November	60	24	31-60	40.0						
December	30	27	0-30	45.0						
		60		100.0	1	1.5	2	60	40	30

It can be noticed from the table that during the first quarter when the sales are uniform the DSO is also uniform at Rs.2,000 and during the second quarter when the sales are exhibiting an increasing trend, the daily sales decrease and DSO increase with an increase in the averaging period. During the third quarter when the sales are decreasing the daily sales increase and DSO decrease with an increase in the average period.

As far as the Ageing Schedule is concerned it can be noticed from the table that in a period of increasing sales (Quarter July-Sept) a larger proportion of current receivables i.e., receivables belonging to the lowest age group emerged during the third quarter, a relatively low percentage 45 as compared to 75 of quarter II belonging to the age group 0-30 days. This need not imply that liquidity of receivables is higher in quarter II as compared to quarter III. It so happens that because of the increasing pattern of sales in quarter II, a larger percentage of sales is billed during September and exactly the opposite situation prevailed in quarter III.

Collection Matrix

In order to study correctly the changes in the payment behavior of customers, it is helpful to look at the pattern of collections associated with credit sales. Table 16.6 below shows an illustrative collection matrix. For example, the credit sales during the month of January are collected as follows: 10 percent in January (the month of sales), 42 percent in February (the first following month), 36 percent in March (the second following month), and 12 percent 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 percentages that could be useful in projecting monthly receipts for each budgeting period.

Table 16.6

Collection Matrix

Percentage of receivables collected during the	January sales	February sales	March sales	April sales	May sales	June sales
Month of sales	10	14	15	12	9	13
First following month	42	35	40	38	35	31
Second following month	36	40	21	26	26	26
Third following month	12	11	24	19	25	25
Fourth following month				5	5	5

Though various techniques have been discussed here for the management of accounts receivables, in practice very few Indian companies have a stated and systematic credit policy. Companies have to strengthen their management of receivables by having explicit and articulate credit policies, an efficient collection program and better co-ordination between production, sales and finance departments.

SUMMARY

- Any business firm operates by selling goods on credit. Thus, finished goods sold on credit become receivables, which again form a major part of the current assets of a firm. The main objective of receivables management is to boost sales to a point where the returns that the company gets from the receivables is less than the cost that the company has to incur in order to fund these receivables.
- Maintaining receivables is no free job. The cost of maintaining receivables includes the additional funding required by the company, administrative costs, collection costs and default costs. Every company requires a proper credit policy to make sure that the cost of maintaining receivables is minimum.
- The credit policy looks at ways for a trade-off between increase credit sales leading to increased profits and the cost of having a larger amount of cash locked up in receivables as well as the losses due to bad debts. The variables associated with credit policy include credit standards, credit period, cash

discount and collection program. While application of stiff credit standards might lead to lower receivables, it also reduces sales. On the other hand, liberal credit standards increase sales, but also have a high incidence of bad debts.

- Credit period refers to the time period allowed for customers to pay for their purchases. Increasing the credit normally increases sales as well as the incidence of bad debts and vice-versa. Cash discounts are the discounts offered by companies to induce customers to pay much earlier than the normal credit period. A liberal cash discount policy involves increasing the discount percentage or lengthening the period of discount period.
- Collection program is the efforts made by a company to collect its payments that are due. This includes monitoring the state of receivables, dispatching letters reminding customers of their due dates, telegraphic and telephonic advice to customers, threat of legal action against overdue payment.

Chapter XVII

Cash Management

After reading this chapter, you will be conversant with:

- The Difference between Profits and Cash
- Need For and Objective of Cash Management
- Factors for Efficient Cash Management
- Internal Treasury Controls

DIFFERENCE BETWEEN PROFITS AND CASH

Cash, the most liquid asset and also referred to as the life blood of a business enterprise is of vital importance to the daily operations of business firms. Its efficient management is crucial to the solvency of the business because cash is the focal point of the fund flows in a business.

Profits vs. Cash

There is a general tendency to confuse profits with cash. But there is a difference between the two. Profits can be said to be the excess of income over the expenditure of the business entity, for a particular accounting period. They include both cash incomes (cash sales, interest on investments, etc.) and non-cash incomes (credit sales, discounts received, excess provisions like provision for doubtful debts charged in the previous accounting period, etc.). Similarly both expenses in cash/check (payment of salaries, wages, interest on term loans, etc.) and non-cash expenses (depreciation, preliminary expenses incurred during incorporation which are written-off every year, outstanding expenses like unpaid salaries or rent or insurance) where there is no actual outflow of cash at the time of accounting are included. 'Cash' refers to the cash as well as the bank balances of a company at the end of the accounting period, as reflected in its balance sheet. While profits reflect the earning capacity of a company, cash reflects its liquidity position.

Meaning of Cash

There are two ways of viewing the term 'cash'. In a narrow sense it includes actual cash in the form of notes and coins and bank drafts held by a firm and the deposits withdrawable on demand. And in a broader sense, it includes even marketable securities which can be immediately sold or converted into cash.

NEED FOR AND OBJECTIVE OF CASH MANAGEMENT

We have seen earlier that cash is embedded in different forms of current assets ranging from raw material inventory to Accounts Receivables and comes back in the form of cash again along with profit after completing one round of the company's operating cycle. In view of the 'flow of cash' through successive phases of the operating cycle, cash can be regarded as the life-blood of a body corporate.

Cash, either in hand or at bank, is the most liquid of all the current assets. Thus larger cash and bank balances indicate high liquidity position of a company. It must, however, be noted that cash lying in the coffers of a company or in the current account of banks fetches no return to the company. Consequently, the higher liquidity position attained by holding a large amount of cash will result in lower profitability as idle cash fetches no return, while the same when invested in the assets of the company will result in profits. Why should companies, then, hold cash and bank balances knowing fully well that no return can be expected of them?

Why do Companies Hold Cash

Let us now turn to the need for holding cash (which is taken to be inclusive of cash at bank as well) by the corporate sector. The need for holding cash arises from a variety of reasons which are briefly summarized below.

TRANSACTION MOTIVE

A company is always entering into transactions with other entities. While some of these transactions may not result in an immediate inflow/outflow of cash (eg: credit purchases and sales), other transactions cause immediate cash inflows and outflows. So firms always keep a certain amount as cash to deal with routine transactions where immediate cash payment is required.

Precautionary Motive

Contingencies have a habit of cropping up when least expected. A sudden fire may break out, accidents may happen, employees may go on strike, creditors may present bills earlier than expected or debtors may make payments later than warranted. The company has to be prepared to meet these contingencies to minimize its losses. For this purpose companies generally maintain some amount in the form of cash.

Speculative Motive

Firms also maintain cash balances in order to take advantage of opportunities that do not take place in the course of routine business activities. For example, there may be a sudden decrease in the price of raw materials which is not expected to last long or the firm may want to invest in securities of other companies when the price is just right. These transactions are of a purely speculative nature for which the firms need cash.

LACK OF PROPER SYNCHRONIZATION BETWEEN CASH INFLOWS AND OUTFLOWS

In the case of reasonably well-managed profitable companies, the total amount of cash inflows for the year is usually higher than the total amount of cash outflows. However, the company can have spells of cash deficits and surpluses. This kind of a situation arises mainly due to lack of proper synchronization between cash inflows and outflows. Seasonal industries such as tea, jute are typical examples of mismatching of inflows and outflows. Consequently, these companies tend to follow a conservative cash management policy by holding more cash.

ASYMMETRY IN THE CONSEQUENCE OF 'SHORTAGES' AND 'SURPLUSES' OF CASH

Orgler comes out with an interesting argument that the Finance Manager is more worried about the situation of an 'uncovered cash deficit' than the situation of surplus cash lying idle in the bank. This attitude on the part of the Finance Manager is quite understandable as the deficiencies in cash management are more likely to come out into the open during a period of cash crunch than in a period of cash surplus. As the opportunity loss sustained by the company for keeping excess cash at bank is not likely to affect all sections of the employees while inability to meet wages and salaries does, the Finance Manager may feel tempted to err, if at all, on the conservative side. This will have the impact of the need for additional cash lying at bank.

Objectives of Cash Management

All or some of the reasons explained above give rise to the company's need for cash. The question will naturally arise as to the amount of cash to be maintained by a company. While trying to answer this question one should not lose sight of the fact that cash is the most liquid of all the assets and can be put to alternative uses. So, idle cash has an opportunity cost as the same could have been invested to fetch a positive return. Thus, the objective of cash management can be regarded as one of making short-term forecasts of cash position, finding avenues for financing during periods when cash deficits are anticipated and arranging for repayment/investment during periods when cash surpluses are anticipated with a view to minimizing idle cash as far as possible. Towards this end short-term forecasts of cash receipts and payments are made in the structured form of cash budgets, information is monitored at appropriate intervals for the purpose of control and taking suitable measures as warranted by the situation.

Cash Forecasting and Budget

The principal tool of cash management is cash budgeting or short-term cash forecasting. Usually, the time chosen for making short-term forecast for preparing cash budgets is taken to be one year. For the purpose of better monitoring and control, however, the year is divided into quarters, quarters into months and months into weeks. Under critical conditions a week is further divided into days.

Cash budget becomes a part of the total budgeting process under which other budgets and statements are prepared. The information generated during the preparation of operating budgets such as sales forecasts, wages and salaries, manufacturing expenses overheads etc., will become useful. While the operating budgets are prepared based on the principles of accrual, cash budget is concerned with cash inflows and outflows.

Short-term cash forecasting is prepared under the receipts and payments method, showing the time and magnitude of expected cash receipts and payments. The various items of cash receipts and payments and the basis for estimating them is listed below:

Items of Cash Inflow	Basis of Estimation
Cash sales	Sales forecast. The proportion of cash sales and credit sales are based on averages of recent past.
Collections from credit sales	Same as above along with past collection pattern unless there is a policy change to depart from past practices.
Proceeds from sale of scrap and/or by-products	Based on the past proportion of these items to sales.
Receipts of interest and dividends	Based on the company's investment portfolio and the returns expected therefrom.
Increase in long-term loans, public deposits and issuance of other long-term securities	Based on capital expenditure budget and financing plan.
Sale of assets	Based on the proposed disposal of assets.
Payments for purchases	Purchases plan based on sales forecast, anticipated changes in the inventory of raw materials, stores, spares, components etc., proportion of cash and credit purchases as also the payment pattern based on past practice.
Wages and salary payments	Based on payroll accounts of the previous year with suitable adjustments, manning pattern and the structure of wages and salaries along with perquisites.
Payments for other manufacturing expenses such as power, fuel etc.	Based on the production plan and past experience.
Payments for selling and distribution and general administration expenses	Based on sales promotion plans, distribution costs, salary structure of personnel in the marketing and general administration; other items for payment are based on past experience or a rule of thumb.
Interest payment and repayment of loans and redemption of debentures and preference shares; repayment of public deposits	Based on the existing structure of fixed-return bearing securities and financing plan.
Payment of dividends	Based on projected after-tax profit and dividend-pay out policy followed.
Payments for the purchase of capital assets	Based on capital expenditure budget and the payment pattern.
Lease rentals	Based on the terms under which capital equipment was taken on lease.
Taxes	Based on estimated pre-tax profit.

Preparation of Cash Budget and its Usefulness

On the basis of information discussed above the cash budget for a company can be prepared. It will be useful to prepare initially a work sheet containing items of cash inflows and outflows and the resultant net cash inflows and outflows and the net cash flows. At this state one can have an idea of cash by scrutinizing the pattern and amount of inflows and outflows to see whether some of the items of outflows can be either advanced or postponed so that outflows are not clustered during certain months. This is possible only with discretionary payments, such as, payment for purchase of capital equipment, non-recurring items of outflows for research and development activities etc. While these are important, no significant impact on the profitability of the company is likely to be felt if these items of cash outflows are deffered by a couple of months. This flexibility will not be available to mandatory payments such as meeting the installments on term loans obtained. Let us now consider first the preparation of a work sheet and then have the cash budget. This is illustrated by means of an illustration for a six month period.

The most important input in the entire process of cash forecasting is the estimated sales figure because business plans are closely related to estimated plans.

Illustration 17.1

VRK Industries manufactures razor blades. Its sales figures are given below.

	Actual Sales Rs.		Forecasted Sales Rs.
November	1,00,000	January	1,00,000
December	1,00,000	February	1,00,000
		March	1,20,000
		April	1,20,000
		May	1,40,000
		June	1,40,000

- Cash and credit sales are expected to be 20 percent and 80 percent respectively.
- Receivables from credit sales are expected to be collected as follows: 50% percent of receivables, on an average, one month from the date of sale and balance 50 percent, on an average, two months from the date of sale.
- No bad debt losses.
- Rs.50,000 expected from the sale of a machine in March and Rs.2,000 expected as interest on securities in June.

	Actual Purchases Rs.		Forecasted purchases Rs.
December	40,000	January	40,000
		February	40,000
		March	45,000
		April	50,000
		May	55,000
		June	55,000

- The payments for these purchases are made a month after the purchase. The payment for purchases in December will be made in January.
- Miscellaneous cash purchases of Rs.2,500 per month are planned from January through June.

- Wage payments are expected to be Rs.16,000 per month, January through June. Manufacturing expenses expected to be Rs.20,000 per month; general administrative and selling expenses are expected to be Rs.10,000 per month.
- Dividend payment of Rs.20,000 and tax payment of Rs.18,000 are scheduled in June.
- A machine worth Rs.55,000 proposed to be purchased on cash in March.
- Opening cash balance is Rs.20,000. The management policy is to maintain a minimum cash balance of Rs.18,000. Given the above information work out a statement of Cash Receipts forecast, Cash Payments forecast and the Cash Budget for the period January - June.

Solution

Forecast of Cash Receipts (January – June)

	Item of Cash Receipts	January	February	March	April	May	Rs. June
1.	Cash Sales	20,000	20,000	24,000	24,000	28,000	28,000
2.	Collection on Credit Sales	80,000	80,000	80,000	88,000	96,000	1,04,000
3.	Sale of Machine	–	–	50,000	–	–	–
4.	Interest on Securities	–	–	–	–	–	2,000
	Total Cash Receipts (1+2+3+4)	1,00,000	1,00,000	1,54,000	1,12,000	1,24,000	1,34,000

Forecast of Cash Payments (January – June)

	Item of Cash Payment	Jan.	Feb.	March	April	May	Rs. June
1.	Payment on Credit Purchases	40,000	40,000	40,000	45,000	50,000	55,000
2.	Misc. Cash purchases	2,500	2,500	2,500	2,500	2,500	2,500
3.	Wage Payments	16,000	16,000	16,000	16,000	16,000	16,000
4.	Manufacturing Expenses	20,000	20,000	20,000	20,000	20,000	20,000
5.	General Administration & Selling Expenses	10,000	10,000	10,000	10,000	10,000	10,000
6.	Dividend	--	--	--	--	--	20,000
7.	Tax	--	--	--	--	--	18,000
8.	Capital Equipment Purchase	--		55,000	--	--	
	Total Cash Payments	88,500	88,500	1,43,500	93,500	98,500	1,41,500

Cash Budget for the period (January – June)

	Item	Jan.	Feb.	March	April	May	Rs. June
1.	Opening Cash Balance	20,000	--		--	--	--
2.	Total Receipts	1,00,000	1,00,000	1,54,000	1,12,000	1,24,000	1,34,000
3.	Total Payments	88,500	88,500	1,43,500	93,500	98,500	1,41,500
4.	Net Cash Flow (2-3)	11,500	11,500	10,500	18,500	25,500	(7,500)
5.	Cumulative Net Cash Flow	11,500	23,000	33,500	52,000	77,500	70,000
6.	Opening CashBalance + Cum-NCF (H 5)	31,500	43,000	53,500	72,000	97,500	90,000
7.	Minimum Cash Balance	18,000	18,000	18,000	18,000	18,000	18,000
8.	Surplus or Deficit in relation to Min.Cash balance	13,500	25,000	35,500	54,000	79,500	72,000

From the above statement of cash budget it can be seen that a cash shortage is expected during the month of March. From the month of April cash balance would improve as the business operations would bring in cash flows. Further, the shortage expected during March is due to the proposed capital expenditure decision. This shortage can be avoided by the management by adopting one of the following options: (i) postponement of the asset acquisition to a later month when cash inflows improve, (ii) deferring a portion of the payment for the capital asset to April, May & June, and (iii) resorting to short-term borrowing in the month of March.

Cash Reports

Cash budgets are nothing but short-term cash forecasts and their advantage lies in their amenability in monitoring actuals for exercising control. The purpose of monthly cash reports will be served when cash inflows and outflows do not fluctuate very much and the collection and payment patterns are stabilized. When there is high uncertainty in the cash flows, then the need arises to monitor information on the cash position more frequently on a weekly or sometimes on daily basis and to revise the budget for the subsequent period based on the variance between the actual and budgeted figures and the reasons thereof.

For a multi-product multi-branch company, it is better to have cash budgets and cash reports both product-wise and branch-wise.

Thus cash reports provide a comparative picture of actual with forecasted figures and help in controlling and revising cash forecasts continuously. Cash reports can be prepared in several ways and the important ones are (i) the daily cash report, (ii) the daily treasury report, and (iii) the monthly cash report.

Daily Cash Report

1.	Opening Cash Balance		–
2.	Receipts		–
	Cash sales		***
	Collection on Credit Sales		****
	Loans		****
	Others Receipts	****	
3.	Payments	***	
	Cash Purchases		****
	Payment to Creditors		****
	Repayment of Loans		****
	Other Payments		
4.	Net Cash flow (2-3)	****	
5.	Closing Cash Balance (1 + 4)	***	

The daily cash report provides information on the cash position on a daily basis. Though this information is helpful for control purposes, it does not indicate the position of Accounts Receivables, Accounts payable and marketable securities of the company. Hence a close watch is required to get a comprehensive picture of changes in cash, marketable securities, debtors, and creditors. Therefore, a daily treasury report has to be prepared which will indicate the opening and closing net treasury positions.

Daily Treasury Report

		Today	This month to date
1.	Cash		
	a) Opening Balance	xxx	xxx
	b) Receipts	xxx	xxx
	c) Payments	xxx	xxx
	d) Closing Balance(a+b-c)	xxx	xxx
2.	Marketable Securities	xxx	xxx
	a) Opening Balance	xxx	xxx
	b) Purchases	xxx	xxx
	c) Sales	xxx	xxx
	d) Closing Balance (a+b-c)	xxx	xxx
3.	Accounts Receivable		
	a) Opening Balance	xxx	xxx
	b) Bills Raised	xxx	
	c) Cash Receipts	xxx	xxx
	d) Closing Balance (a+b-c)	xxx	xxx
4.	Accounts Payable		
	a) Opening Balance	xxx	xxx
	b) Bills Received	xxx	xxx
	c) Cash Payment	xxx	
	d) Closing Balance (a + b – c)	xxx	xxx
5.	Opening Net Treasury Position (1a + 2a + 3a - 4a)	xxx	xxx
6.	Closing Net Treasury Position (1d + 2d + 3d - 4d)	xxx	xxx

Cash Report for the Month of

	This Month			Year to Date		
	Actual	Budget	Variance	Actual	Budget	Variance
Cash Receipts						
Cash Sales						
Collections on Credit Sales						
Interest and Dividend Receipts						
Short-term borrowings						
Long-term borrowings						
Issue of Long-term securities						
Sale of Assets						
Total						
Cash payments						
Cash Purchases						
Payment for credit purchases						
Wages and Salaries						
Manufacturing Expenses						
General, Administration and selling expenses						
Interest Dividends						
Taxes						
Capital equipment purchases						
Repayment of Loans						
Redemptions of long-term securities						
Total						

The monthly cash report, thus, shows the cash position on a monthly basis.

FACTORS FOR EFFICIENT CASH MANAGEMENT

Cash reports help in monitoring actual data for comparison with the budgeted amounts, understanding the reasons for the deviation between the two and in the light of this knowledge, controlling and revising the budget on a regular basis. The efficiency of cash management can be enhanced considerably by keeping a close watch and controlling a few important factors briefly described and illustrated below:

Prompt Billing and Mailing

A time lag occurs from the date of despatching goods to the date of preparing invoice documents and mailing the same to the customers. If this time gap can be minimized early remittances can be expected, otherwise remittances get delayed.

In the case of one organization it was observed that the time lag was as high as one week. Subsequent scrutiny revealed that the reason for delay was the practice of preparing bills and mailing them in 'bunches'. As a result the bills on earlier sales got delayed resulting in late realization. Once the reason for the delay was identified, corrective measures were taken to prevent the accumulation of bills. This reduced the delay in remittances. Thus accelerating the process of preparing and mailing bills will help reduce the delay in remittances and early realization of cash.

Collection of Cheques and Remittance of Cash

Delay in the receipt of cheques and depositing the same in the bank will inevitably result in delayed cash realization. This delay can be reduced by taking measures to hasten the process of collecting and depositing cheques/cash from customers. An Illustration will help understand how this can be achieved.

An organization having branches in all the districts of West Bengal had been selling fertilizers to a great extent by a vast network of consignees receiving a margin for the services rendered. Quite often the consignees would make remittances to the head office in Kolkata resulting in delays in cash realization. An in-depth study revealed that delays could be considerably reduced by adopting the following procedure:

- The consignees should be asked to prepare challan-cum-invoice on credit sales which would cut-short the work of raising separate bills.
- Non-operating collection accounts had to be opened in the district level branches of the head office bank into which checks and cash from sales are to be deposited by the consignees, under advice to the branch manager. The amounts so deposited are to be transferred to the main bank account of the head office telegraphically, under advice to the head office. The branch managers/their assistants should make occasional visits to the bank branches as also to the consignees for ensuring compliance with the instructions issued.

The above practice considerably reduced the delay in receipts with a resultant decrease in the incidence of interest on the cash credit account of the head office.

Centralized Purchases and Payments to Suppliers

The company can gain some advantages, as listed below, when purchases and payments to suppliers are centralized at the head office:

- By the sheer size of purchases there is scope to obtain bulk purchase discounts on certain items which will effectively reduce the cost.
- As cash receipts get consolidated at the head office, the disbursement schedule can be more effectively implemented. As far as possible, the company can make an arrangement with suppliers so that the payment schedule matches with the schedule of cash receipts.

- As far as possible cash discounts on purchases can be utilized, preferably by remitting cheques on the last day for utilizing such facility. This will release cash within the discount period and the company can also avoid the implicit rate of interest underlying the failure to avail cash discount[1], as this rate will be considerably high.
- Under the centralized purchase system, arrangements can be made with the suppliers for direct shipment of materials to the company's units located at different parts. This will reduce to some extent the total cost of transportation, handling and storage.

Playing the Float

The basis for the concept of 'float' arises from the practice of banks not to credit the customer's account in its books when a cheque is deposited by him and not to debit his account in its books when a cheque is issued by him until the cheque is cleared and cash is realized or paid respectively. In the normal course of business, a company issues cheques to suppliers and deposits cheques received from customers. It can take advantage of the concept of float, while doing so. Let us see what float means.

Whenever cheques are deposited with the bank, the credit balance increases in the company's books of account but not in the books of the bank until the cheques are cleared and money realized. The amount of cheques deposited by a company in the bank awaiting clearance is called 'collection float'. Similarly, the amount of cheques issued by the company awaiting payment by the bank is called 'payment float'. The difference between 'payment float' and 'collection float' is called 'net float'. Obviously, when the net float is positive, the balance in the books of the company is less than that in the bank's books; when net float is negative the book balance of the company is more than that in the bank's books.

When a company has a 'positive net float' it may issue cheques to the extent that the amount shown in the bank's books is higher than the amount shown in the company's books, even if the company's books indicate an overdrawn position. The company is then said to have been playing the float. This is illustrated by means of a numerical Illustration before considering the merits and demerits of playing the float.

Suppose, the opening credit balance of a company with the bank is Rs.10,000. Let us assume that it deposits cheques daily to the amount of Rs.30,000 and it takes three days for realization. Let us also assume that the company issues cheques daily to the amount of Rs.30,000 and it takes five days for actual payment. The opening balance in the company's books as also in the bank's books will remain the same at Rs.10,000. The closing balance in the books of the company and in the books of the bank are presented in table 17.1 below:

Table 17.1

Closing Balance in the Books of the Company and in the Books of the Bank

Day	Books of the Company	Books of the Bank
1.	Remains at Rs.10,000 as the decrease of Rs.30,000 the amount of cheques issued is offset by the increase of Rs.30,000, the amount of cheques deposited.	The opening balance of Rs.10,000 will remain as the closing balance and the company's accounting will remain unchanged.
2.	– Do –	– Do –

1 This has been discussed with numerical illustrations in Chapter 16 on Receivables Management.

3.	– Do –	– Do –
4.	– Do –	The opening balance of Rs.10,000 increases by Rs.30,000 as the amount of the first day's cheque gets encashed. The closing balance is Rs.40,000.
5.	– Do –	The opening balance of Rs.40,000 will increase by the amount of Rs.30,000 due to the encashment of the second day's cheque deposited. Thus the closing balance is Rs.70,000.
6.	– Do –	The opening balance of Rs.70,000 is increased by Rs.30,000 due to the encashment of the third day's cheque deposited and reduced by Rs.30,000 due to the payment of the cheque issued on the first day. So the closing balance from now onwards will remain at Rs.70,000.

From table 17.1, it can be noticed that from day six onwards the closing balance remains stable at Rs.70,000 in the books of the bank. The closing balance in the company's books will, however, remain at Rs.10,000. Consequently, the company will continue to enjoy a net float of Rs.60,000 (Rs.70,000 – Rs.10,000). As a result of this, the company issues cheques amounting to Rs.40,000 or Rs.50,000 even if the company's book balance is only Rs.10,000 because of the net float of Rs.60,000 available to it. While the number of cheques issued and deposited by the company is assumed to be the same for the sake of simplicity, it can differ. Then, the net float will become the difference between the balance in the bank's books and the balance in the company's books.

While a company can obtain greater mileage out of its cash balance by playing the float, there are certain inherent risks involved. When the clearing system operates much faster than anticipated, the cheques issued may come for payment earlier than anticipated leading to financial embarrassment to the company. When the word goes round that the cheques issued by the company to a supplier had bounced the company's image will be at stake. In order to minimize the risks associated with playing the float a company can take some of the following precautionary measures and obtain greater mileage out of its cash resources.

- A minimum amount of cash can always be maintained with the bank.
- Desist from the temptation to use a larger proportion of the net float.
- Preferably have an overdraft arrangement with the bank to avoid financial embarrassment.

Investment of Surplus Cash

Investing surplus cash involves two basic problems:

i. Determining the amount of surplus cash

ii. Determining the channels of investment.

DETERMINATION OF SURPLUS CASH

The cash in excess of the firm's normal cash requirements is termed as surplus cash. Before determining the amount of surplus cash, the minimum cash balance required by the firm has to be accounted. This minimum level may be termed as a 'safety level for cash.'

The safety level of cash is determined by the Finance Manager separately for normal and peak period. In both the cases, the two basic factors to be decided are:

a. Desired days of cash: This is the number of days for which cash balance should be sufficient to cover payments.

b. Average daily cash outflows: This is the average amount of disbursements to be made daily.

The 'desired days of cash' and 'average daily cash outflows' are to be determined separately for normal and peak period. Then the safety level of cash can be calculated as follows:

During Normal Periods

Safety level of cash = Desired days of cash x Average daily cash outflows;

Illustration 17.2

The finance manager feels that a safety level should provide sufficient cash to cover cash payments for a week and firm's average daily cash outflows are Rs.15,000. The safety level of cash will be Rs.1,05,000 i.e., 7 x 15,000.

During Peak Periods

Safety level of cash = Desired days of cash at the business period x Average of highest daily cash outflows.

Illustration 17.3

During the four busiest days in the month of March, a firm's cash outflows were Rs.6,000, Rs.7,000, Rs.8,000 and Rs.9,000. The Finance manager desires sufficient cash to cover payments for 4 days during the peak periods. Calculate the safety level.

Solution

The average cash outflow

$$= \frac{6,000 + 7,000 + 8,000 + 9,000}{4}$$

= Rs.7,500

Safety level = 4 x 7,500 = Rs.30,000

Illustration 17.4

From the following data ascertain whether the firm has surplus or deficiency of cash

	Normal Periods	Peak Periods
Desired days of cash	7	5
Average daily outflows	25,000	50,000
Actual cash balance	1,00,000	2,50,000

Solution

During normal periods – The firm has a cash balance of Rs.1,00,000. The average daily cash outflows are Rs.25,000. It means the firm has cash available only for 4 days as compared to a requirement for 7 days. Hence, the firm is cash deficient.

During peak periods - Cash balance is Rs.2,50,000 and average daily cash outflows Rs.50,000. The firm has cash available for 5 days which is equal to the required 5 days. Hence the firm is neither cash deficient nor is cash surplus. It has just sufficient cash.

Determination of Channels of Investment

The Finance Manager can determine the amount of surplus cash, by comparing the actual amount of cash available with the safety level or minimum level of cash, as explained in the preceding pages. Such surplus cash may be either of a temporary or a permanent nature. Temporary cash surplus consists of funds which are available for investment on a short-term basis (maximum 6 months), since they are required to meet regular obligations such as those of taxes, dividends, etc. Permanent cash surplus consists of funds which are kept by the firm to use in some unforeseen profitable opportunity of expansion or acquisition of some asset. Such funds are, therefore, available for investment for a period ranging from six months to a year.

Criteria for Investment: In most of the companies there are usually no formal written instructions for investing the surplus cash. It is left to the discretion and judgement of the Finance Manager. While exercising such discretion or judgement, he usually takes into consideration the following factors:

a. **Security:** This can be ensured by investing money in securities whose price remains more or less stable and where a minimum return is guaranteed.

b. **Liquidity:** This can be ensured by investing money in short-term securities including short-term fixed deposits with the bank.

c. **Yield:** Most corporate managers give less emphasis to yield as compared to security and liquidity of investment. They, therefore, prefer short-term Government securities for investing surplus cash. However, some corporate managers follow aggressive investment policies which maximize the yield on their investments.

d. **Maturity:** Surplus cash is not available for an indefinite period. Hence, it will be advisable to select securities according to their maturities keeping in view the period for which surplus cash is available. If such selection is done carefully, the Finance Manager can maximize the yield as well as maintain the liquidity of investments.

For example, a firm can divide the surplus cash available with it in three categories:

i. Surplus cash, which is to be made available for meeting unforeseen disbursements. Such cash should, therefore, be invested in securities which can be immediately sold without much loss. In case of such cash, liquidity is more important than yield.

ii. Surplus cash, which is to be made available on certain definite dates for making specific payments such as those on account of tax, dividends, capital expenditure, etc. Such cash should, therefore be invested in securities whose maturities coincide with the dates of payment.

iii. Surplus cash, which is a sort of general reserve and not required to meet any specific payment. Such cash can therefore, be invested in securities with relatively longer maturities and more favorable yields.

Forms of Liquidity and Choice of Liquidity Mix

While a company's demand for cash has already been discussed above, it does not always keep the entire amount in the form of cash balance in the current account for the simple reason that the opportunity cost of idle cash is considerably high. That is why, companies try to maintain, besides cash, other liquid assets which provide some return but at the same time can be converted into cash within a reasonably short time with relatively low risk. Let us first consider the forms of liquidity and then the choice of liquidity mix.

Forms of Liquidity

Cash Balance in the Current Account: This is the highest form of liquid asset a company can conceive of, but the return provided by it is nil. However, companies maintain approximately four to five percent of their total assets, on the average, in this form despite no returns for reasons already explained.

Keeping Reserve Drawing Power under Cash Credit/Overdraft Arrangement: This form of liquidity appears to be quite attractive as it can have access to bank borrowing. However, constraints imposed by the banking sector made it much less attractive than what it once used to be. Close scrutiny of the quarterly budgets of the company by banks and imposition of penal interest of two percent over and above the normal rate of interest on under- or over-utilization

make this form more tedious and time consuming. However, a built-in cushion may possibly be included while preparing the quarterly budgets and during some periods the full amount may be drawn. The tax benefit on the interest makes effective after-tax rate to be much less costly, even if part of it is held in the form of idle cash. This not only helps as a liquid source but also helps in obtaining equal or higher limits during the forthcoming year.

Marketable Securities: These are short-term securities of government such as treasury bills and other gilt-edged securities whose default risk is nil and, for that very reason, the return is low. It is preferable to ensure the maturity structure of these short-term securities with the likely periods of excessive cash drain on the part of the company. Then, the transaction costs can be considerably minimized as early liquidation prior to maturity may result in low return from these assets.

Investment in Intercorporate Deposits: A company can invest money with other companies in the form of short-term deposits ranging from two or three months to five or six months at remunerative rates. However, these deposits being unsecured in nature, are subject to considerable risk, unless the companies accepting such deposits have excellent antecedents as to their paying habits.

From among the different forms of liquidity available to a company a deliberate choice has to be made in selecting an appropriate mix that suits the liquidity requirements of the company and disposition of its management towards risk.

Choice of Liquidity Mix

The choice of selecting the portfolio of cash and near cash assets also known as the choice of liquidity mix is governed by a variety of factors which are briefly explained below:

Uncertainty Surrounding Cash Flow Projections: It is generally said that the only certain factor in the corporate environment is its uncertainty. Even if cash flow projections have been made with the utmost care the general uncertainty can at times make the projections go awry. However, the degree of uncertainty is more in certain types of industries than in others. For example, general engineering industry is more recession prone than others. Consequently, the onset of recession which was not anticipated may call for a thorough revision of cash flows and policy changes in respect of production plans, dividend payments, etc. Similarly tea plantations can get adversely affected with an untimely hailstorm. Even within the same company which is stable and growing certain types of cash flows, especially collections and payables tend to be more uncertain than others. When the degree of uncertainty is high as evidenced by the sensitivity of cash forecasts to adverse changes in some of the underlying assumptions, the company will do well to have the liquidity mix tilted largely towards cash balance and in so far as possible reserve drawing power under the cash credit/overdraft arrangement and to a less extent gilt-edged securities.

On the other hand certain types of industries such as synthetic fabrics, electrical appliances enjoy stable and growing demand. Once a company has established its image the degree of uncertainty surrounding cash flow projections will be comparatively less. Consequently, the liquidity mix of such companies will be tilted more towards marketable securities and intercorporate deposits.

Attitude of the Management towards Risk: When the management of the company attaches greater importance to a given percentage increase in return than to the same percentage increase in liquidity, the portfolio of liquid assets held by such company will have a higher proportion of intercorporate deposits and a lower proportion of marketable securities and cash balances.

When the attitude of the management towards risk is quite conservative the liquidity mix chosen tends to have a higher proportion of cash balance and marketable securities and a lower proportion of intercorporate deposits.

Ability to Raise Non-bank Funds and/or Control its Cash Flows: When a company is favorably placed in a position to have ready access to non-bank funds it can afford to have less proportion of cash and more of intercorporate deposits

and marketable securities. This kind of a situation arises mostly in the case of group companies. For example, when a manufacturing company promoted by a group faces cash shortage, a finance and investment company promoted by the same group can come to its rescue by providing funds. Such a company need not maintain a large portion of its liquid assets in the form of cash. Similarly, companies which can control their cash flows effectively need not hold a large proportion of idle cash in their liquidity mix. This kind of situation can arise in the case of companies that have horizontal or vertical integration. For example a manufacturing company which has got substantial interest and/or has promoted another company for the supply of raw materials the company can exercise greater control on payables.

On the other hand, companies which do not enjoy ready access to non-bank sources of funds and/or not in a position to control cash flows may need to have greater proportion of cash and reserve drawing power in their liquidity mix.

Models for Determining Optimal Cash

Given the overall transactions and precautionary balances, the finance manager of a firm would like to consider the appropriate balance between cash and marketable securities. This is because, optimal levels of cash and marketable securities would reduce and minimize the costs such as (a) transaction costs – costs incurred for transferring marketable securities to cash or vice versa, (b) inconvenience costs; and (c) opportunity costs – the interest earnings foregone on marketable securities for holding cash. In this section, we will discuss' three models for determining an appropriate balance between cash and marketable securities.

Inventory Model

If future cash flows were known with certainty, the EOQ model (used in inventory management) is one of the simple models for determining the optimal average amount of transaction cash. Here, in this model, the opportunity (carrying) cost of holding cash, is balanced against the fixed costs associated with securities transactions to arrive at an optimal balance.

By using the EOQ formula, the firm attempts to determine the funds transfer size that will minimize the total cash costs that is, total transaction cost and total carrying (opportunity) costs.

Total cost = Transaction cost + Carrying (opportunity) cost

This cost can be expressed as: F (T/C) + I(C/2).

Where,

F = Fixed transaction cost associated with a transaction *

T = Total demand for cash over the specified period

I = Interest rate on marketable securities for the period **

C = Cash balance for the period

Note that:

* Assumed to be independent of the amount transferred.

** Assumed to be constant.

In the above formula, T/C reflects the number of transactions during the period. If we multiply T/C with F that is, fixed cost per transaction, we will get total fixed cost for the period. C/2 implies the average level of cash balance over the period of time involved and when it is multiplied with the interest rate (I), we will obtain the total carrying (opportunity) cost. From the above equation, we conclude that the larger the C or C/2, the smaller the total transaction cost [F (T/C)] and the higher the opportunity cost [I (C/2)]. Balancing the two costs can minimize total costs. The optimal level of cash can be determined using the underlying equation.

$$C = \sqrt{\frac{2FT}{I}}$$

Illustration 17.5

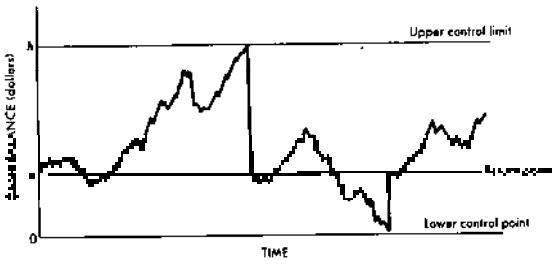
Suppose ABC Ltd., a manufacturing firm, expects its total cash payments over the planning period (2-months) to be Rs.10,00,000, while the fixed cost per transaction is Rs.100 and the interest rate on marketable securities is 12 percent per annum, or 2.0 percent for the 2-month period. Substituting these values, C = $\sqrt{(2\times10,00,000\times100/2}$ = (100,000,000 = Rs.10,000.) Thus, if the firm maintains an average cash balance of Rs.10,000, it can minimize its total costs. It is noted that the limitations and assumptions of this model are similar to that of the EOQ inventory model.

Stochastic Models

Since the EOQ model assumes a constant demand for cash, this inventory model becomes inappropriate when the cash flows of the firms are relatively or reasonably unpredictable, and some other models must be employed to determine optimal cash balances. If cash balances fluctuate randomly, we can apply control theory to the problem. To apply, assume that the cash flows are stochastic and random, and then set control limits such that when cash balance touches the upper bound, a conversion of cash into marketable securities is undertaken, and when it approaches the lower bound, a transfer from marketable securities to cash is activated. And, no transactions take place as long as the cash balance remains within these bounds.

Here, the question is how to set these boundaries (bounds) such that they should depend upon both fixed costs of a transaction and the opportunity cost of holding cash. For determining these limits, there are many control limit models, however, we study a relatively trouble-free one, the Miller-Orr model. This model specifies two bounds – h dollars as an upper bound and 0 (zero) dollars as a lower bound; is demonstrated in the following figure, assuming that there is no underlying movement in the cash flows during the period.

Figure: 17.1



Source: Merton H.Miller and Daniel

From the figure, we can observe that when the cash balance reaches the upper bound, h-z dollars (cash) are converted into marketable securities, and the new balance becomes z dollars (return point). When the cash balances hit the lower bound (zero dollars), z dollars of marketable securities are transferred to cash, and the new balance again becomes z dollars. And, as long as the cash balances stays within the bounds, no transaction is undertaken. Note that the lower bound (control limit) is taken as zero only for our better explanation, and can be set higher than zero.

The optimal value of return point, z is:

$$\mathbf{z} = \sqrt[3]{\frac{3F\sigma^2}{4i}}$$

Where 'F' is the fixed transaction cost, 'σ' is the variance of daily net cash balances, and 'i' is the interest rate per day on marketable securities. The optimal value of 'h' is 3z. The model reduces the total fixed transaction cost and total opportunity cost by setting these bounds. However, the average cash balance

recommended by the control-limit models will be higher than that of the EOQ model, as these models assume that cash flows are stochastic and unpredictable.

A Probability Approach

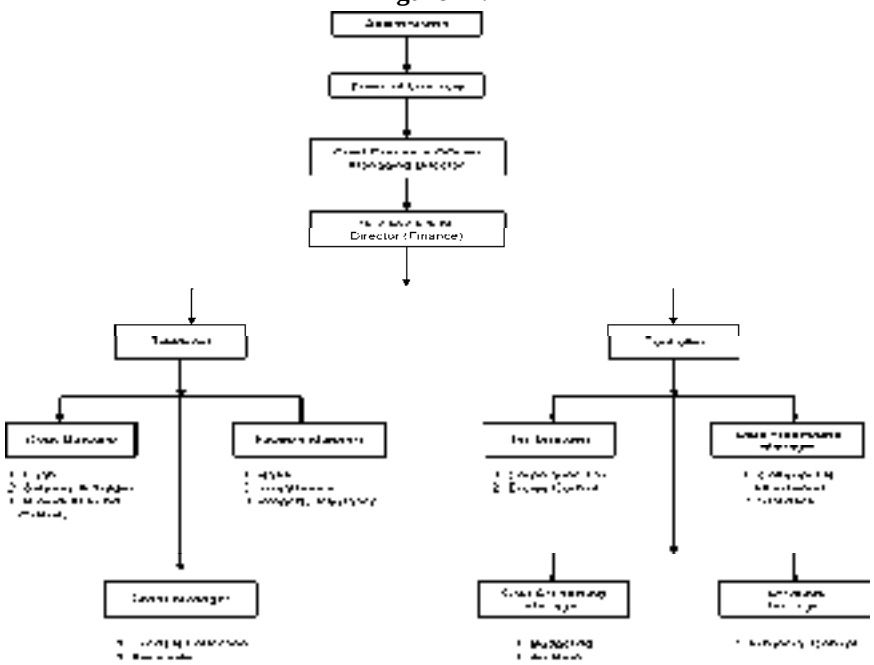
In practice, depending upon the nature of the business, the cash flows of a firm can be predictable within a range. Although the economic-order-quantity (EOQ) model assumes constant demand, when there is only moderate uncertainty, the model can be modified through the inclusion of safety (buffer) cash against uncertainty. And, for those cases, where the uncertainty is large, the EOQ model becomes inappropriate. In contrast, when the cash flows of the firm are relatively or reasonably unpredictable, a stochastic model can be employed to make automatic transfers between cash and marketable securities. This is because, when we employ this model in place of the EOQ model, we will always end up with a higher level of average cash balance, and this higher level of average cash balance is not appropriate for those firms, whose cash flows are reasonably predictable.

For those firms, whose cash flows are neither reasonably predictable, nor reasonably unpredictable, a probabilistic approach can be applied. To get a probability distribution, end-of-period cash balances are to be estimated for different cash flow outcomes. For more accuracy, length of the period used should be short say, one-week or less. This probabilistic information, together with information about the fixed (transaction) cost and interest earnings on investments in marketable securities is required to estimate the initial balance between cash and marketable securities. Once the information is available, compute the expected net earnings [interest earned – (fixed transaction cost + opportunity cost)] associated with initial levels of marketable securities for different possible cash flow outcomes. The level at which expected net earnings are maximized is the optimal level of marketable securities.

INTERNAL TREASURY CONTROLS

Structure and Organization of Treasury

Figure 17.2



The organization of finance department differs from company to company. There is no statutory pattern. Legally and theoretically, the right of managing a company

vests in its shareholders, but their numbers being large and scattered, this task is entrusted to the Board of Directors. The main representative of the Board of Directors is the Chief Executive Officer/Managing Director. He is the competent authority to take decisions on matters relating to the overall policy formulations and execution. To learn about the constitution of the treasury, a study can be made about the constitution of the finance department. The finance department is headed by the Vice President (Finance) to whom the Treasurer and the Controller are responsible.

Treasury

The treasury in the finance department deals with liquid assets and thus the treasurer has a major responsibility of being a custodian of cash and other liquid assets. The other functions of the treasurer are:

- Formulate capital structure for the organization in accordance with business goals and implement the same.
- Management of liquid assets including cash.
- Acts as a cashier.
- Role of an authorized signatory on payment checks including the authority to approve such checks.
- Reconciliation in checking accounts.
- Overall management of the credit function of the firm.
- Authority to utilize surplus cash of the company in short-term beneficial investments.
- Establishes the company policy with respect to decision on trade discounts and vendor payment aging.
- Establishes relationship with the bankers and investors.

All the above mentioned functions are implemented by the treasury with the co-operation of the cash manager, finance manager and the credit manager.

Controller

Just as the treasurer deals with liquid assets, the controller of the organization has to record the transactions of these liquid assets. It is the combined and effective working of both the departments that gives rise to an effective system of internal controls.

Some of the functions of the Controller are:

- Records all transactions in the general ledger, the accounts receivables and the accounts payables sub ledger, transactions with respect to fixed assets such as depreciation, inventory control etc.
- Looks into the aspect of taxes and insurance.
- Keeps track of the company's short-term investments by recording and reconciling the transactions with those of the brokerage firms.
- Looks into the regulatory aspects and implementation of the company's policy on trade discounts and receivables aging.
- Acts as planning director.
- Keeping a record of the attendance of the employees, their movement timings so as to facilitate in preparing payroll.
- Reporting information to the management.

To assist the controller in accomplishing the above are the tax manager, data processing manager, cost accounting manager and accounting manager. Thus, the functions of financial accounting, internal audit, taxation, management accounting and control, budgeting, planning and control are accomplished.

Other Aspects

The size of the treasury depends on the size of the organization. Big companies, usually the public limited companies and large private sector giants like Reliance Industries Ltd., ITC, VST etc., may have the structures as mentioned above or similar to it. However, small fledgling organizations usually have the Director (Finance) to take major policy decisions and fulfill the role of both the treasurer and controller. He will have the finance manager, accounts officer and the cashier to look into aspects of the implementation and thus assist him, or in some cases, some of these officials are responsible even for more than one of the above listed functions. Once the rules and regulations are framed in respect of various functions of the treasury, it is important that these standards of accounting and control are properly implemented and strictly adhered to.

Accounting and Control

In small family holdings, sole proprietorship and partnership firms, accounting and control measures are closely held between the promoters. They would do everything on their own and see to the day-to-day transactions. However, as the organization grows, it will become humanly impossible to check individually and thus the need for a system of internal accounting control would be felt. The types of risks a company would face are:

- Entry of counterfeit documents, vouchers, challans, receipts into the accounting system.
- A 'no-care attitude' towards the policies introduced by the management.
- Loss/Misplacement of important documents.
- Inaccuracy in reporting and recording transactions.
- Unauthorized disposal of assets.
- Failure and inefficiency in safeguarding the assets.
- Neglect of work in the event of non-allocation of authority and responsibility.

Purpose of Establishing Control

Ideally, the internal control system is designed to prevent any financial impropriety by the employees. The thrust is not on detection of such a happening, but to prevent it. When implemented a proper control system automatically hints at the weakness of the major policies with respect to managing cash, receivables, discounts, investments, etc.

Implementation of effective system of accounting and controls deters the people from committing any act of fraud. The very fact that their actions are being monitored will prevent them from committing any such acts. Of course, people inclined to steal/misappropriate will go elsewhere where they have easy access.

Example: The unauthorized use of telephones by the staff for personal purpose. The cost controller of a company was quite concerned about the highly inflated telephone bill. As it was not possible for him to personally tell each employee to minimize the use of telephone for personal use, he installed a printing machine on to the telephone which would give details on the telephone calls with respect to the number dialed and duration of the call. This automatically created an awareness among the employees that their calls would be monitored. It was not surprising therefore to note, that the bill for the subsequent months had reduced.

However, every company should understand that people who 'want to make hay, while the sun shines' will do so, whatever be the systems of control implemented. One can only hope that the system implemented is strict and fool-proof which will make risk taking even more difficult.

Design of Internal Control

Internal control systems are designed according to the size of the firms. Large firms either have the audit staff to design and implement the control system or appoint experts of the treasury and control function to design the same. Smaller companies whose treasurer and controller may not have the experience in formulating a system of control often employ the services of consultants or their auditors. Some of the guidelines which are adhered to while designing an internal control system are:

- A plan to segregate responsibilities based on functions.
- Allocation of responsibilities between the maintenance of records (by the controller) and custodianship of cash and other liquid assets (by the treasurer).
- A system for proper documentation and recording procedures.
- Formulation of policies and procedures in tune with the organization's long-term goal and a systematic model for implementation of those policies.
- Appointment of suitable personnel whose qualifications, interest and experience are commensurate with the nature of job and responsibilities to be entrusted to them so as to obtain maximum job enrichment.

Manning the System

Human resources are the most important resource available to an organization to successfully implement the control system. Capable persons must demonstrate their ability to execute the job which has been entrusted to them. The treasurer and controller should emphasis on the basic skills and qualifications a prospective employee needs to have for a particular type of job. Experienced people are particularly selected when they have in-depth knowledge of the procedures, documentation, loopholes in the system and how the same can be detected. If inexperienced people are placed in responsible positions, the more experienced people may take advantage of this and misguide them to suit their own convenience. Certain companies also introduce sessions of 'Personnel development' and other training programs in order to familiarize them with current business practices and latest software technology.

Maintenance and Monitoring of Internal Control Systems

a. **Identification of problem:** The control system must be able to identify an upcoming problem and suggest solutions to each situation at the earliest.

   Example: There are two unrelated employees working in a company. One is the supervisor in the controlling department who issues checks and the other is in the treasurer's office who has custody of the signature plate of the authorized signatories for various levels of payment. As long as both are not related, there would seem to be no problem as there is a segregation of duties. Suppose, later they become very good friends, there are chances that they may connive with each other to make misappropriations.

b. **Cost-Benefit Analysis:** Every control system has costs involved in both monetary terms and in terms of time spent by people to prepare and review the control systems. Whatever be the case, a company is benefited only when the cost of controls does not exceed the loss it is trying to prevent from occurring.

   To effectively implement cost beneficial controls, one should make a study of:

   – The opportunity costs in preventing the occurrence of frauds, misappropriations, theft, errors, negligence.

   – Recurrence of such misappropriations and its cost if the control system was not implemented.

   – The total costs incurred in establishing a control system.

c. **Monitoring for Compliance:** Just as policies and procedures of a company require to be complied with, so also the rules with internal control systems. Each system needs to be monitored constantly to ensure that it is implemented. It is specially important when the employees do not feel the necessity for a particular type of control.

One of the methods for ensuring compliance is to select a representative sample and test them. The procedure which can be followed is:

– Define the test: It is very important to define a particular control to be tested.

Example: The controller and treasurer of a company decide to measure their internal deposit float – the time taken to record and deposit a customer's check. The procedure to be followed would be to first check their daily deposit register with the number of checks received on the relevant day. A study of the bank statement will also be made to know if the deposits have been accounted for at the bank. The number of days from the receipt of the checks to their deposit at the bank will be the internal deposit float. Of course, an important observation here is that the deposit float should be for one day. Such results should then be compared to the projections as given by the management policy. Any deviation, if noted can be rectified by suitable means.

– *Select the transactions for testing:* In usual cases, a representative sample is taken for testing, a non-compliance of which would mean losses. If such results are obtained for some tests, one can also take up a statistically significant sample. Size of the sample is important. However, one should also provide for certain errors which can occur while using statistically significant samples. In order to prevent such errors, a pre determined rate of tolerable error and the expected rate of error in the population should be accounted for. There are published tables which will provide sample sizes based on tolerable error and expected error.

– *Conduct the test:* Using the selection method, the test methodology and sample size, the test should be conducted. As the rate of tolerable error has already been established, all results falling outside the purview of this error will be the number of exceptions.

Example: We assume that 5% is the tolerable error on continuing with internal deposit float. It means that the internal float can be greater than 1 day, not more than 5% of the time and the results of the test show that the float exceeds 1 day, 10% of the time. If the average daily deposit is Rs.1,00,000 and the borrowing rate is 10%, then

To compute the cost of non-compliance of the control:

Daily deposit	=	Rs.1,00,000
Exception rate –	=	5%
Tolerable rate (10% – 5%)		
Daily deposit not in compliance	=	Rs.5,000
Annual interest rate	=	10%
Annual cost of non-compliance	=	Rs.500

Certainly the cost of non-compliance of Rs.500 is insignificant when compared to the daily deposit inflow of Rs.1,00,000. However, if more such costs are obtained for non-compliance of the internal control measures, it will certainly add up to a sizeable sum.

The Daiwa Episode[2]

One of the major financial disasters in the banking sector was the damages incurred due to the actions of a single individual of the DAIWA BANK – one of Japan's largest banks. The collapse of the internal control systems led to nearly $1.1 billion losses.

Mr Toshihide Iguchi was Daiwa's head of securities trading and bank office functions. Thus, he was both the 'cashier and the accountant'. It all started with a small loss of $2,00,000 in the trading of securities. Mr Iguchi covered this loss by selling some securities of the bank and concealing these sales by forging statements. M/s Bankers' Trust – The US Investment bank and Daiwa's custodian of securities – would regularly send in statements to Mr Iguchi. As Mr Iguchi had already fraudulently disposed off the securities, he would then prepare a forged statement (to cover the loss) on the letterhead of Bankers' Trust and forward the same to his higher authorities. As Daiwa continued to incur more losses, this modus-operandi continued not for 1 or 2 weeks, but for 11 long years. By this time, the magnitude of the loss was an average of $4,00,000 per working day. This lapse also failed to come to the notice of the internal auditors of the bank.

It was only when Mr Iguchi confessed about this incident through a letter sent to the President of Daiwa bank that this catastrophe was discovered. The reason for this self-confession was a change in the administrative arrangement whereby the Securities trading division was shifted and Mr Iguchi was no longer the head. Obviously, the exposure of the fraud was inevitable. In spite of this, Daiwa could bear the loss of $1.1 billion due to its strong capital base.

Some of the reasons for the collapse were:

- The Investment bank, which was the custodian of the securities was unaware of the disposal of the securities.
- The internal auditors failed to notice the frauds that continued for nearly 11 years.
- The top management was unaware that it lost $1.1 billion probably because of the weakness of the accounting system and false bookkeeping.
- Precautions were not observed by the auditors in obtaining certificates of compliance and concurrence from the custodians of the assets (Here – The Bankers' Trust).
- Entrusting one person with all the responsibility of maintaining both trading and accounting.
- Entrusting a job to one person for a very long period (Daiwa bank now wishes that Mr Iguchi had gone for an annual vacation).

Internal Audit

The Institute of Internal Auditors has defined Internal Audit as "An independent appraisal activity, within an organization, of the review of accountancy, financial and other operations as a basis for service to the management. It is a managerial control which functions by measuring and evaluating the effectiveness of other controls."

Internal audit is therefore an independent appraisal activity within an organization. Not only is its nature to check matters relating to pure finance, but also reviews and undertakes a critical appraisal of the policies and procedures of the company.

Small companies with lots of attention from the senior management who look into the operations of the firm on a daily basis may not have the necessity of conducting an internal audit. However, as companies grow and diversify, it becomes difficult for the management to involve themselves in the day-to-day

2 Source: Article by Mr S. Venkitaramanan, Former governor of Reserve Bank of India in the **Business Line dated October 9, 1995.**

administration. To prevent non-compliance of the company's rules, regulations and procedures, the management delegates this responsibility to internal audit staff. The audit staff on completion of their review submit their reports to the top management. In public limited companies, an audit committee plays the role of the internal audit staff.

Objectives of Internal Audit

Unlike an independent auditor, the internal auditor has to look into the working of the whole organization – let alone only the financial operations.

a. **Evaluation of Internal Controls:** Internal controls in the areas of treasury, accounting and operations are evaluated and reviewed by the internal auditors to assess the operations and the adequacy and effectiveness of such controls. They should also assess the costs incurred in implementing an internal control system and see that the costs do not exceed the losses the control systems are designed to avoid.

b. **Verification of Documentation:** Verification of documents is particularly important for companies whose branches are geographically located in remote places. Reconciliation of accounts of the head office with the branch office, though time consuming, is essential. The top management cannot always be present at the site daily to check the proceedings. For the same reason, internal auditors conduct verification regarding –

   – Equity
   – Accounting books and records
   – Appraisal of quality of work in carrying out assignments
   – The extent to which the company's assets are accounted and the methods to safeguard against losses
   – Accuracy of the reports to the head office
   – Recommending operational innovations.

c. **Compliance:** "Sticking to the rules" is one of the primary aspects to be considered by the internal auditors. Framing rules and regulations for an organization is one thing and ensuring that these regulations are adhered to is another thing. Having strict and regulated controls which are not followed renders the whole system redundant. People also have a tendency to revert to the initial procedures if they do not find the controls convenient to stick to. They would also like to simplify their work by following previous practices without being aware of the consequences such changes may have on other control functions of the company. For most corporate offices who have their branches at remote places, design of control system is initiated at the corporate office, and the same system is implemented at the branch. However, if the corporate office has incorporated some new system without realizing the necessity of the same in the branch, the system may not be used at all in the branch. A compliance review conducted by the internal auditors would then help unearth the flaws in such a system. In this manner, the internal audit staff will act as a link and a medium of express communication between the head office and the branch office.

   To summarize, the other objectives of an internal audit are:

   – To ensure the management that the internal control systems and the accounting procedures are effective in design and operation.
   – To assist management to obtain maximum utilization of resources.
   – To help in preparation of reports which would be helpful to the lower, middle and top management.
   – To ensure that liabilities have been incurred for legitimate purpose of the business.
   – To facilitate the annual audit to be conducted by the external auditor.

Elements of Internal Audit

Successful completion of internal audit depends on the elements of internal audit to which due importance is given. The elements also represent the basic procedures which will simplify the completion of internal audit, they being:

a. **"Totality:"** This concept demands that all aspects of the organization should be considered for purpose of review and control. If the system is imposed partially, it may not give the desired effect to promote overall efficiency in the controls of the organization.

b. **"Expertize:"** This represents the professional aspects of the job. Only those with professional qualifications and experience and who are well acquainted with the principles and practices of internal audit are appointed as internal auditors.

c. **"Independence:"** This means that the internal auditors have the opportunity and permission to report directly to the senior management.

d. **"Objectivity:"** The objectivity aspect of internal audit judges the efficiency and effectiveness of the system when put into operation. The system should not only be able to ensure accuracy and reliability of records, but should also be able to safeguard the assets.

e. **"Utility:"** All the systems are finally put to practice, to be of ultimate utility to the management and not to lead to redundancy.

Limitations of Internal Audit

As every procedure has its pros and cons, the system of internal audit is not without the following drawbacks:

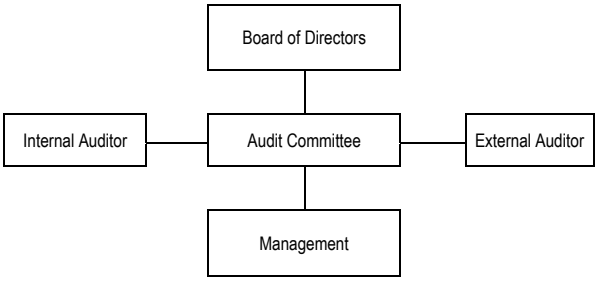
- Inefficient staff will not undertake adequate examination of the records. Thus, the very purpose of 'Totality' is defeated.
- Inefficiency will creep in if the records are not checked immediately after they are prepared.
- Internal audit will not serve its rightful purpose if the internal auditor is also performing other executive functions of the company.

Differences between Internal Audit and Independent Audit

	Internal Audit	Independent Audit
a. Objectives	Scrutiny of policies and procedures of the management to improve operational efficiency.	Report on the financial position and operating capacity of the firm.
	Equal importance to economy and efficiency of business.	Report to be true and fair.
b. Appointment	Optional	Statutory according to law.
	By the board of directors/management	Appointed by the shareholders/proprietor.
c. Scope	To ensure compliance to the policies of the management (which are laid down by the management).	To ascertain the accuracy of accounting information, accounting principles and procedures.
	Free to adopt any method of Report to the top management on the adequacy of internal control working.	Specialized/Statutory procedure of working.
	Report to the top management on the adequacy; of internal control.	Report to the shareholders.

	Concerned about detection of fraud, misrepresentation, forgery, irregularities.	Not to detect fraud, unless it quantitatively effects the financial statements.
d. Approach	To ensure substantial accuracy of records and compliance to the rules already set.	To ensure true and fair presentation accounts.
e. Independence	They are employees of the firm, but must have no affiliation to either the treasurer, the controller or any department which they audit.	They are not employees of the company whose auditing has been undertaken and are strictly independent from the company.
f. Periodicity	Continuous review of company's operations.	Audit is undertaken on a periodic basis – Once a year.

Audit committee



A new dimension given to the concept of auditing is the formation of audit committees in corporate entities to further strengthen the credibility of financial information. The audit committee is a sub-committee of the Board of Directors and are primary responsible to review the financial statements before submitting the same to the Board of Directors. They also have to oversee the process of internal audit and the hiring and working of the external auditor. The audit committee can be considered as a valuable link between the management, the internal auditor, external auditor and the Board of Directors and will also help build a better understanding of the policies of the company and a sound process of decision making.

Objectives of Audit Committee

- Evaluation of financial reports and policies of the company which are distributed to shareholders and other parties interested in them.
- Assessment of the extent of performance, levels of the management and staff.
- Assurance to the shareholders that the actions of the company are in line with the target and that the company is exercising proper social responsibility.
- Monitoring of solutions to various operational problems.
- Acting as an independent reporting channel for the internal audit department.
- To have an overview of the implementation of the recommendations of the internal and external auditors.

Effectiveness of Audit Committee

Formation of an audit committee is not the be-all and end-all of the process of accounting and control. It is important that the audit committees comprise of efficient members to accomplish the tasks assigned to them.

- Member directors need to be strong to question the policies and practices of the top management (when necessary).
- They should have the authority to direct the external auditor to certain flaws which are already unearthed by the internal auditors.
- Qualified and independent directors who represent the interests of the company and work for the progress of the company should be selected for the audit committee.

Physical – Custodial Controls

Common controls in the accounting department center around the recording of transactions wherein the risk of losing/misplacing a document is greater than theft.

As treasury controls generally affect cash and investment, the treasury has to verify various accounting and procedural controls. Both physical and custodial controls comprise the following methods by which the risk of losses is reduced:

1. **Control of Authorized Signatories**

   The most efficient method of fixing the limits for the authorized signatories is to follow the hierarchical format in the organization. Thus, one can establish the signature authority for a particular departmental head up to a particular rupee level. Any transactions which exceed the limit will call for permission from the next higher official. After the limits of authorization are fixed, the accounting department has to match the signatures of the authorized individuals to the transactions. This is usually supervised by the treasurer.

2. **Control over Mail Receivables**

   As the treasury is concerned with receipt of the monetary instruments like cash and cheque, strict control should be enforced over the mail receivables. Cheques are usually recorded in the cheques receipt register and then forwarded to the bank and accounts department for records and documentation. Reconciliation can be made from time to time to know the flaws in the control system.

3. **Control over Pettycash**

   Petty cash is one of those areas where the most liquid asset, i.e. cash is kept. Therefore, a system designed to minimize the risk of loss at acceptable levels should be implemented.

   a. *Recording of Vouchers:* Vouchers should record the date of disbursement, the name of the recipient and the purpose of the disbursement along with the signature of the authorized person for the value of the voucher. After recording these vouchers, the accounting department replenishes the cash box. At the end of the financial year, the accounting department should receive all the vouchers to record the expenses.

   b. *Reconciliation of Petty Cash:* Some companies with an active petty cash usually reconcile the accounts on a day-to-day basis. This reconciliation should be conducted by an individual independent of the functions of the maintenance of petty cash transactions.

   c. *Establishment of Petty Cash Amount:* In practice, a fixed amount is maintained for the petty expenses of one month. Ideally, the cash is as low as possible in order to minimize the risk of loss. If the requirements exceed the fixed amount, vendors have to submit the invoices for their requirement.

4. **Control of Bad Debts and Account Credits**

   Individuals who are entrusted with the responsibility of recording new receivables should not be in a position to credit the same accounts. These credits can be:

   – Writing-off bad debts
   – Credit memos
   – Discounts
   – Refunds
   – Reconciliation of Accounts.

   This practice is to prevent them from having an opportunity to reduce their own balances in accounts.

5. **Control over Receivables and Customer Payments**

There should be a demarcation over the duties of individuals who receive cash and those who record the receipts of cash. The person who records the cash receipts should not deal with incoming mail or prepare any statements for the customers. Such controls will prevent misappropriation of cash receipts and recording.

Example: If there is no demarcation of duties, money received from customer A will be misappropriated, the payment received from customer B will be credited in A's account, payment from customer C will be credited in B's account and the chain goes on.

The treasurer should be entrusted with the responsibility of reconciling the receivables ledgers. As he also holds the prime responsibility of collection of all dues, supervision of the treasurer is important. If a person other than the treasurer is checking the books, he can countercheck the accounts with the treasurer. Requests for confirmation can be had from the customer by sending a statement of account by mail. Here also, care should be taken that the person preparing the confirmation list is different from the person holding the accounts receivables function. If not, the person preparing the confirmation list would change the address on the confirm list, and see that these statements reach his own house rather than the customer. Obviously, the response received will state that the statement of account is right.

6. **Control over Investments**

One of the responsibilities of the treasurer is to invest surplus funds into profitable investments on behalf of the company. As the size of these investments is considerable, strict control is very important. The investment controls deal with issues such as:

a. **Accountability:** The Board of Directors authorize an individual (usually the treasurer) to deal with the investment portfolio. Special instructions for the treasurer are also incorporated, some of which are:

- Comprehensive responsibility
- Authorized persons to assist the treasury department
- Securities for investment
- Acceptable risk
- Term for investment
- Qualification of brokerage firms
- Reporting about transactions
- Custodianship
- Procedures for change in policy.

b. **Dual controlled custody:** Dual controlled custody involves keeping securities in a bank safety deposit box with two keys. The controller and the treasurer has one key each.

c. **Authorization:** Only individuals who have the qualifications and competency to make investment decisions on behalf of the company are given authorization for selection of brokerage firms, etc. A brokerage firm's track record with respect to their response for complaints, investigation, arbitration disputes should be studied in detail before committing the business of the company.

d. **Execution:** After surplus funds are invested in various firms, a periodic monthly review should be conducted by the company with the brokerage firm. An individual independent of the investment function should perform the function of reconciliation. After review, a report on the firm's investment function is forwarded to the Board of Directors

for their information. It may be recalled that many banks lost heavily in the securities scam of 1992, because the brokers had virtually a free run and nobody reconciled the transactions for a long time.

7. **Control over Disbursements**

   The disbursement function includes maintaining the custody of stock of checks, preparation of checks and supervising the disbursing function. The controller has the sole responsibility of being the custodian of checks. He has to maintain a log book on the checks issued. The treasurer reconciles the accounts after the controller has made the record of disbursements.

   In addition to the duty of check disbursements, the controller also plays an active role in preventing payroll fraud. Some of the common issues which perpetuate fraud in this system are:

   – Inaccurate tax deductions and withholding from payroll.
   – Payment to fictitious employees.
   – Overpayment to employees (for work not done).
   – Payment irregularities to government (regarding certain taxes and provision).
   – Inaccurate accumulation of payroll statistics.

8. **Control over Capital Stock and Dividends**

   Exercising control over the capital stock and dividends can be accomplished by:

   – Accurate recording of all transactions;
   – Compliance with the directives of the management;
   – Adherence to the rules of the government.

   a. **Services of a Registrar:** According to law, all public trading firms should employ the services of a stock registrar. According to the charter of the corporation, the registrar issues stock. Only those stock certificates which bear the signature of the registrar are considered valid. In case, individuals purchase stock without the signature of the registrar, it is a sure case of fraudulent issue by the company.

      Private placements do not require to comply with the formality of appointing a registrar. The Board of Directors appoint officers for this purpose. They have the authorization to sign the stock certificates.

   b. **Services of a Transfer Agent:** On appointment of a registrar, a transfer agent is also appointed for maintaining a record of the shareholders and for executing all other formalities concerned with the transfer of stock ownership.

      On request by the company, the transfer agent should give the list of the shareholders to the Board of Directors. Such a list will enable the company to not only determine the number of votes each shareholder is entitled to, but also helps determine a dividend declaration date.

      For disbursal of dividends, the management usually forwards one check covering the payment to the transfer agent and the agent accordingly arranges for individual cheques to the shareholders.

Insurance Control

A part of the internal control mechanism also deals with protection of assets. This is where insurance becomes an important aspect. Large companies usually engage insurance specialists/professional consultants to give them the necessary guidance to insure their assets. Most companies also insure against catastrophic loss where they feel that of losses may effect the operational capacity of the firm.

Insurance Review and Analysis

Professionals recommend that all organizations conduct an annual review and analysis of the insurance aspects – both at macro and micro level. Thus, the firm's

overall risk of loss can be analyzed. To enable such an analysis, the internal control procedures should have the following components:

- A list of all the policies of the company;
- Assurance that all the policies are stored in a safe place;
- Verification that none of the policies are redundant in the aspect of coverage;
- A written statement that the coverage taken is adequate and not excessive.

A detailed study of the above will bring to light certain shortcomings for which adjustment will have to be made in areas such as:

- Increase or decrease of fixed assets;
- Number of employees;
- The range of business/activity the firm engages in.

Coverages

Depending on the size, the line of activity and the extent of risk, companies may opt for various types of insurance coverages.

a. **Blanket (Umbrella) Policies:** Also called excess liability coverage, such policies insure all other risks which are not covered under any policy. When claims exceed the coverage of all other policies, this coverage can be resorted to.

   Example: If a personal judgment injury exceeds the limit specified in a policy, the excess liability will be covered by the blanket policy. If the liability exceeds the blanket policy's limits, then the insured is on his or her own.

b. **Insurance against Business Interruption:** Business interruption insurance covers losses which result from occurrences which halt the proceedings of an organization. Most common occurrences attributable are:
   – Riots and strikes
   – Floods
   – Storm
   – Fire
   – Explosions
   – Loss of data due to failure in computer systems.

   This apart, some companies may depend on an uninterrupted supply of materials from another company. Therefore, they can buy a policy against interruptions of that supply.

c. **Employees Health Insurance:** A standard perquisite expected by employees in companies is medical benefits for themselves and their dependents. However, some companies also provide a policy wherein the employee and the employer contribute a portion as premium each month. The Employees State Insurance Act (which is next only to the Provident Fund Act in terms of being a powerful legal provision) has made it compulsory for all organizations to cover their employees under this act (who draw up to Rs.3,500 per month).

   The premium in early 2000 was

   1.5% – Employee's contribution

   4.5% – Employer's contribution

   on the basic monthly income. All expenses for any casualties are borne by the ESI Hospitals.

d. **Insurance against Non-performance:** When non-performance of tasks can result in material damages such as in the construction of buildings or other capital assets, these insurance coverages are particularly useful. It thus covers a third party beneficiary if your company does not perform as agreed upon.

e. **Insurance against Employees:** Job hopping has become a common phenomenon in today's world of emerging career opportunities. Moreover, a company's work would suffer if employees placed at suitably responsible positions leave their work undone. Though the concept of Fidelity bonds have yet to emerge in the Indian scenario, these bonds have been enforced in countries like the USA, Canada. Fidelity bonds cover the actions of its employees against the company and its customers. Some companies resort to obtaining a comprehensive bond (which will cover all employees) rather than take up individual bonds for each employee. Employees whose jobs involve considerable risk to the firm such as investment officers usually have to execute a separate bond.

f. **Life Insurance of Key Personnel:** Loss of life of key personnel of a firm would do the firm considerable material damage. Some companies who have an insurable interest in the life of their key personnel also arrange for an insurance policy for them. Such a policy would provide for and compensate the loss of service and subsequent profits which were to be obtained. However, if the company is the beneficiary in such policies, such premiums are not tax deductible as they cannot be considered a necessary business expense.

Information Systems and Reporting

Information systems were in vogue even before the advent of computers. Such systems provided managers with vital information to plan and control operations. The computers have now only added speed, accuracy and increased database which offer a wide range of alternatives to arrive at a decision.

The basis of an information system in the treasury is the flow of money throughout the organization. Periodically, the management provides a financial plan (also called the master budget). Responsibilities relating to maintenance of investment, income, expenditure within the limits are assigned to the respective departments. These plans form the basis for generation of reports periodically and become the devices through which control is exercised.

Some of the essential features of an effective reporting system are:

- Result orientation
- All encompassing
- Accuracy
- Promptness
- Forecast for future
- Size of reports is inversely proportional to the management level
- Comparative statements
- Cost benefit analysis.

To have an understanding of the process of information systems and control, studying the following flow chart will be useful.

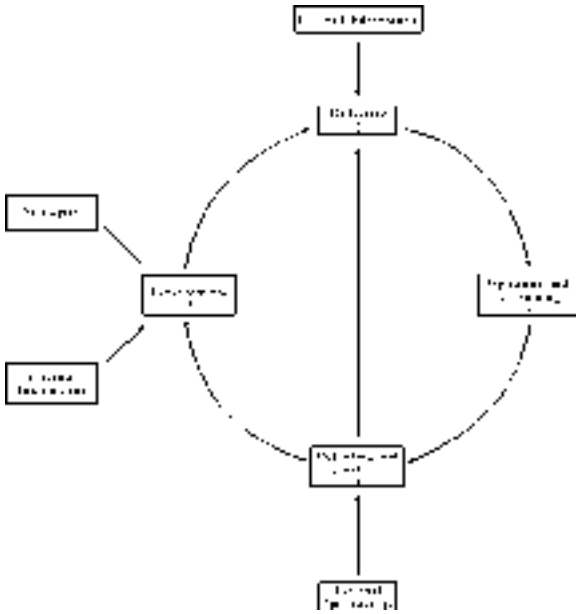
Most of the information systems involve reporting by means of informal communication channels like memoranda, meetings and conversations. However, a more formal methodology involves the following steps:

1. **Programming**

   These are the long-term policies and the short-term programs (for achieving these policies), a company will undertake. It involves formulations of various strategies to achieve the results in a desired manner.

Example: If a strategy is adopted in a pharmaceutical company to improve on the existing products and also search for new products, an R&D program is formulated aimed at bringing in more development in an existing product and another program will be made to bring in innovations to market new products.

Figure 17.3



2. **Budgeting**

   Budget is a plan expressed in monetary terms over a specific time period. Every strategy makes a forecast of the costs to be incurred on implementing the same.

3. **Operating and Accounting**

   During actual operations, accounts of the resources actually consumed and the revenues earned are maintained. These results are then compared to the budgeted figures to study for any deviations. Such data is later used as a base for future programming and measuring the performance of managers of each responsibility center.

4. **Reporting and Analysis**

   After analysis of all transactions, various reports are prepared from each department for review and reporting to the management. These include information collected from the workings within the organization and outside. As reports are a basis for control, the prescribed format of reports is to have a comparison between the budgeted projections and the actual results obtained from operating and accounting. Any deviations are to be explained and suitable options given to change the plans and initiate a new planning process.

   Some of the reports which can be generated by the treasury would be:

   – Daily stock report on Raw materials, Work-in-progress, finished goods;
   – Bank deposits, withdrawals;
   – Report on cash inflow and outflow;
   – Total accounts receivables;
   – Individual party account;
   – Payroll;
   – Comparison between sales and accounts receivables;
   – Cost analysis of acquisition of capital assets and their maintenance.

The contents of the above report will be in line with the extent of information required by the management. The ultimate information should be of use and based on the outcome of such reports, necessary remedial action will be initiated by structuring a new program.

Delegation of responsibility in a reporting system is such that no single person has independent authority over a particular decision.

Example: Cheque payment: Invoices are recorded in the accounts payable sub-ledger by the controller. He also prints the payment cheques with details. Treasurer being the authorized signatory for the cheque, signs it and despatches it. Treasurer also maintains a record of the pre-numbered cheques and the whole stock of cheques. Thus, a cheque is kept over the number of leaves issued to the controller. The controller finally conducts a reconciliation statement to verify about the disbursement of funds.

Measuring Treasury Performance

Hitherto, the ways and means of maximizing performance of treasury have been discussed with the help of various measures like formulating programs, preparing budgets, executing the programs. However, equally important is to know whether the treasury has achieved its targets.

One could argue that it is virtually impossible for organizations to function without some goals and plans. A goal is a future target that an organization wishes to achieve and a plan is the means devised to attain this goal. Every operating unit has a set of goals to facilitate performance. In order to be effective, goals should have five major characteristics:

- Challenging
- Attainable
- Specific and measurable
- Time limited
- Relevant.

Once the goals and forecasts are decided; financial personnel should devise ways and means of financing the ventures in order to achieve their goals. Costs incurred for acquiring capital, risks involved and, securities are to be analyzed before making a commitment on investments.

Control systems should also be such that the targets and allocation of responsibilities are segregated to different departments. Common costs can be shared and care should be taken to see that no conflicts arise because, such conflicts will affect the performance of the management in the long run.

In order to quantify and analyze the profits, they can be compared to the profits generated in the previous financial year. A statement of cash inflows and outflows is the common methodology adopted. A statement on the accounts receivables with the mode of payment will also bring to the notice of the management the most common mode of payment which is realized at the earliest.

Example: If after a study of the sales report for a financial year, it is noted that “Letter of Credit” payment term is realized soon, the management can then decide to concentrate primarily on L/C backed orders.

Thus, just as it is important to devise policies for a company, it is equally important to review its progress time and again, both on quantitative and qualitative terms in order to maximize the performance of the treasury.

Failure of Controls

The following illustrations enrich the reader to know how the lack of controls could result in losses to or downfall of the institutions.

The Sumitomo Debacle

One of the major disasters in the history of derivatives trading were losses incurred by Sumitomo Corporation.

The loss was incurred due to the actions of a single trader, Yasuo Homanaka. The Sumitomo Corporation, one of the world's largest commodities trading firm, and a 300 year old company with a market value of $11.85 billion. Most of its trading was done in metals, chemicals and energy products. In June, 1996, Sumitomo collapsed due to lack of control on exposure limits, accounting for a loss of $1.8 billion.

Yasuo Homanka, a 48 year old Tokyo based copper trader, is the central figure in the Sumitomo debacle. He was Sumitomo's star trader having over 20 years experience in copper trading. He won acclaims from the company for his profits on copper trading which helped Sumitomo cover its cheap sales of copper in Asia. He was trading in the copper since 1975 and was made the head of copper futures trading division. Homanaka traded copper for Sumitomo mainly on the London Metal Exchange.

Sumitomo was not a member of LME and its trades were executed by members of the exchange. Homanaka held large long positions in copper periodically over several maturity periods and several million dollars worth of copper futures contracts annually with the objective of closing them at a profit He held tremendous influence over the copper trading sections and for almost a decade he was able to hold copper prices on the LME higher or lower at his will through his control over international copper stocks and volumes of trades. The strategy was to amass large stocks of copper, squeeze the prices of copper on LME and profit from the derivatives trade. For a very long time, the US hedge funds showed little interest in the commodities market. But around 1994-95 these funds, constantly on prowl for a kill based on their research, expected a fall in copper prices because of new copper production. So they entered the copper market and started short selling large quantity of copper in the forward market hoping to buy them back at lower prices. Homanaka took an opposite position and went on a buying spree. It seems that the US hedge funds could not bring the copper prices down even after selling around 1 million tonne of copper; that was the kind of influence Homanaka wielded in the market. Two Chinese state owned firms hastened the exit of Homanaka. These firms and Sumitomo had a joint venture in copper trades and derivatives. Homanaka used this venture to control copper prices and both of them profitted from this relationship. But these Chinese companies dealt the final blow to Homanaka, when they went against him by selling copper. The US hedge funds, George Soros and the Chinese firms together brought down copper prices and Homanaka with it. Homanaka made huge losses on his long-positions and it is said that these losses constituted the major part of $1.8 bn loss made by Sumitomo over a period of 10 years.

In the aftermath that followed, Homanaka was the first to make a quiet exit into oblivion. The shares of Sumitomo fell by 200 yen on a single day, once the news spread that Sumitomo was in trouble. This was market's reaction to the fear that Sumitomo may sell its large copper holdings.

Sumitomo let Homanaka to have a free rein in copper futures trading out of greed for profits, without actually understanding the extent of risk it is exposed to. Another reason that may have contributed to the loss is the lack of strict vigilance of the Japanese Government over these trading companies that trade outside Japan.

But uncontrolled and irrational use of derivatives with the sole intention of earning speculative profits has been the main reason for the losses.

Indian Bank Fiasco

Indian Bank declared the biggest loss ever made by a commercial bank in India, the loss being Rs.1,336.40 cr. in 1995–96. The major reasons behind this were – loans extended to corporates becoming sticky, booking the interest on NPAs and not following the classification norms. The bank also made an operating loss due to high interest cost of borrowings.

This loss had wiped out the net worth of Indian Bank and had turned its capital adequacy ratio to zero. Indian Bank had surpassed the previous record of Rs.1,089.15 crore loss by the Bank of India in 1993-94. The losses were mainly made due to the sticky loans to corporates including the East – West Airlines, the Poddar Group of Kolkata, SM Deychem and MVR exports. These bad loans were not provided for earlier and amounted to Rs.980.62 crore. The bank did not follow the classification norms for non-performing assets and booked interest on them. These, when reclassified in the year 1995-96, resulted in an interest reversal of Rs.132.1 crore. The bank also made an operating loss of Rs.223.68 crore largely on account of the high interest cost of borrowings from the money market. The RBI has black listed two auditors of the bank – for failing to spot accounting malpractices that helped the bank management conceal the losses.

CRB Fiasco

CRB Group had come a long way since its inception as CRB Consultants in 1985 and went on to become CRB Capital Markets in November, 1991. A year after its incorporation, it went public with an issue of Rs.4.6 crore. In September 1994, the group ventured into the mutual fund industry and mopped up Rs.229 crore from its maiden MF Scheme.

However, a year later SEBI had discovered certain irregularities in the Scheme. Nearly 85 percent of the mutual funds operations were handled by the groups stockbroking company, CRB Share & Stocking, located in the same premises. Apart from this, the securities of the fund were found to be kept in the possession of the CRB Caps instead of CRB Mutual Fund. With the total corpus of the fund having shrunk by 51 percent and NAV dropping to Rs.4.95, as of March 1997, (assets worth was Rs.113 crore) the company became irregular in publishing its NAV. Following these irregularities, SEBI imposed a ban on the CRB Mutual Fund from floating any further schemes since April, 1996.

Continuing its expansion plans, in July 1996, the Group entered the banking sector and got an in-principle approval from the RBI for starting the CRB Global Bank. After this the decline of CRB Capital Markets had begun. Later during the year, in September 1996, CRB Caps applied to the RBI for registration as an NBFC. When the RBI started an audit examination for the registration purpose, one by one the irregularities of the company came into picture. These included the intercorporate deposits and the NRI deposits crossing the stipulated limits and the company defaulting on its ICDs; the deposit periods going beyond the specified limits; broker incentives being very high. And to worsen things there was a severe asset-liability mismatch in the company.

CRB owed huge amounts of money to the market. The assets of CRB (Rs.230 crore) were less than its liabilities (Rs.600 crore). The company was not in a position to pay-off (nearly 200 crore) to its depositors.

If the CRB case is examined keenly it can be observed that there has been a severe mismatch between the assets and liabilities of the company. This was however, not checked at the right time and as a consequence, there was the downfall of CRB Capital Markets.

SUMMARY

- The need for holding cash arises from a variety of reasons, viz. Transaction Motive, Speculative Motive and Precautionary Motive.
- The objective of cash management can be regarded as one of making short-term forecasts of cash position, finding avenues for financing during periods when cash deficits are anticipated and arranging for repayment/investment during periods when cash surplus are anticipated with a view to minimize ideal cash as far as possible.
- Cash budget becomes a part of the total budgeting process under which other budgets and statements are prepared. Short-term cash forecasting is prepared under the receipts and payment method.
- The finance manager of a firm would like to consider the appropriate balance between cash and marketable securities. This is because the optimal level of cash and marketable securities would reduce and minimize the transaction cost, inconvenience cost and opportunity cost.
- Inventory model, Stochastic Model and Probability approach are used to determine the optimum cash balance.

Chapter XVIII

Capital Expenditure Decisions

After reading this chapter, you will be conversant with:

- Nature of the Investment or Capital Expenditure Decisions
- Scanning and Identification of Investment Opportunities
- Criteria for Preliminary Screening
- Other steps of Project Management like Feasibility Study, Implementation and Performance Appraisal
- Introduction to Network Techniques for Project Planning and Control
- Principles underlying Measurement of Costs and Benefits
- Preparing Cash Flow Projections for Projects
- Assessing the Financial Viability of Projects using the various Appraisal Criteria

SECTION 1

NATURE OF INVESTMENT DECISIONS

Shri Shakti LPG Ltd, a Hyderabad based company, put up facilities to import and market liquified petroleum gas, at an estimated cost of Rs.103.50 crore.

- Tata Metaliks has set up a new Mini Blast Furnace with associated systems for manufacture of foundry grade pig iron.
- Lupin Chemicals Ltd. has set up a project to manufacture 'RIFAMPICIN', an anti-TB drug, at an estimated cost of Rs.8,250 lakh.
- The above items, which appeared in newspapers are typical Illustrations of capital expenditure decisions, also referred to as capital budgeting or investment decisions. Such a decision may be defined as the company's decision to invest its current funds most efficiently in long-term assets in anticipation of an expected flow of benefits over a series of years. Capital expenditure decisions occupy a very important place in corporate finance for the following reasons:
  - Once the decision is taken, it has far-reaching consequences which extend over a considerably long period, and influences the risk complexion of the firm.
  - These decisions involve huge amounts of money.
  - These decisions are irreversible once taken.
  - These decisions are among the most difficult to make when the company is faced with various potentially viable investment opportunities.

While capital expenditure decisions are extremely important, managers find it extremely difficult to analyze the pros and cons and arrive at a decision because:

- Measuring costs and benefits of an investment proposal whether it be for a mini-steel plant or a library is difficult because all costs and benefits cannot be expressed in tangible terms.
- The benefits of capital expenditure are expected to occur for a number of years in the future which is highly uncertain.
- Because the costs and benefits occur at different points of time, investment proposal, for a proper analysis of the viability of the all these have to be brought to a common time-frame. Hence time value of money becomes very relevant here.

The investment decision starts with the identification of investment opportunities and culminates in performance review after the project is implemented and operations are stabilized.

Identification of Potential Investment Opportunities

Identification of appropriate investment opportunities is a complicated exercise primarily because of the innumerable investment opportunities available to a promoter. To identify such investment opportunities that are *prima facie* feasible and promising, the promoter has to:

- Scan the various sources that can throw up promising investment opportunities;
- Understand the governmental regulatory framework and policies that have a bearing on the different investments; and
- Appraise the potential investments in relation to his organization's strengths and weaknesses.

Potential Sources for Project Ideas

The sources that can be tapped for identifying promising investment opportunities are numerous and an attempt has been made here to describe some of the important sources.

Market Characteristics of Different Industries

The supply and demand conditions prevailing in the different industries can be analyzed to identify such industries which have unfulfilled demand. Such industries can be subjected to a further scrutiny to examine the present level of capacity utilization, the profitability of the existing units, and the new projects under implementation. Some instances of projects which have successfully capitalized on such unfulfilled demand are presented below:

- When Food Specialities Ltd., introduced 'Maggi' noodles in the market in the early eighties and the product gained a high degree of consumer acceptance, it became evident that a huge unsatisfied demand exists for fast foods. We have seen a number of new entrants in this industry since then.
- The market for spark plugs was virtually a monopoly of MICO until the Modi group recognized the supply-demand imbalance and promoted a new company for manufacturing spark-plugs.
- Perceiving the popularity of 'Surf' in the premium detergents market, Karsan Bhai Patel saw an opportunity to sell detergents to the lower strata of the market, and launched 'Nirma'.

Product Profiles of Various Industries

A study of the end-products (including by-products) of the various industries can throw up new project ideas. The following examples are relevant in this regard:

- An analysis of the inputs required for the various industries can also help in the identification of new projects.
- Linear Alkyl Benzene (LAB), an important input in manufacturing detergents was in short-supply a few years ago. Perceiving the need for this raw material, SPIC floated a new project for manufacturing LAB and many others have followed suit.
- In many industries dominated by large firms, small firms can concentrate on producing components or other specialized parts for the larger firms. Ford Motors, for example, at one time produced their own car window frames but found it more suitable to contract this work out as they could not benefit from the economies open to the specialist firm. In the Indian context, we have the Illustrations of Ashok Leyland and Maruti Udyog which depend upon a large network of ancillary units for manufacturing specific components or parts.

Imports and Exports

The government is keen on promoting export-oriented industries and import-substitution industries. Therefore the promoter might find it advantageous to analyze the trends in exports and imports over the last five to six years, to identify potential investment opportunities. Two examples and a potential idea are given here:

- Cold-rolled coils and many other steel derivatives worth Rs.1,500 crore are imported by India every year. Ispat Profiles India Ltd. identified an opportunity to produce these items indigenously and their project has been doing extremely well.
- ATV group of companies, mainly engaged in Cardamom exports, found an export market for cut flowers and tissue culture plants and have successfully commissioned an export-oriented project for this purpose.

While examining the end-products of a particular industry, it may also be worthwhile to analyze whether one can improve upon the product or find new uses for the existing product. For example Sinter Plast Containers recognized that the

storage tanks made of low density polythene are functionally better suited than the conventional storage tanks for storing water and chemicals. This improved version has indeed gained considerable acceptance in the market.

Emerging Technologies

Analyzing the commercial viability of some of the indigeneously developed technologies or adapting the imported technologies to suit the local requirements can result in identification of potential investment opportunities. The Technology Development and Infrastructure Corporation of India (TDICI) set up by the ICICI and similar venture capital windows promoted by the other financial institutions can provide useful ideas in this regard. The success story of Xerox Corporation in the United States is in fact based on the successful exploitation of a new technology.

- Xeroxography was invented in 1938 by Carlson but he could not sell the technology to business firms successfully. Even IBM was not convinced that it is a promising idea. Xerox Corporation adopted the idea in 1960, and launched photo-copiers with astounding success.
- Hindustan Computers Ltd. Hewlett Packard (HCL-HP) has launched a new computer system based on Intel Corporations Pentium 586 chip. The Pentium 586 processor which is said to be 10 times faster than the normal processor was launched internationally only a month before HCL-HP launched its new system in India.

Social and Economic Trends

An entrepreneur who is quick to spot changes in the social and economic status of the population can identify new opportunities for investment. For instance, there has been a perceptible increase in the demand for readymade garments, and garment units which have spotted this change rather early have successfully exploited the opportunity. Likewise, the middle-income group are becoming less averse to buying goods on credit and recognizing this trend, many finance companies are launching innovative consumer financing schemes.

Consumption Patterns in Foreign Countries

An analysis of the consumption patterns abroad can provide clues for launching new projects. To give an example, Brooke Bond and Food Specialities promoted projects for manufacturing granulated coffee in India after recognizing a shift in the consumption pattern abroad from powdered instant coffee to granulated coffee.

Revival of Sick Units

A sick unit presents a potential investment opportunity to an entrepreneur who has the capability of turning it around. To illustrate:

- Nutrine confectioneries tookover an ailing biscuit manufacturing unit in Andhra Pradesh and turned it around. Likewise Gujarat Narmada Auto tookover Girnar Scooters as a part of its diversification strategy and successfully revitalized the unit. (However, subsequently Gujarat Narmada Auto became sick and was closed down).
- SPIC tookover the loss-making caustic soda plant of Kothari Industrial Corporation Limited and at the same time promoted a downstream petrochemical unit to effectively utilize the chlorine which results as a by-product in the process of manufacturing caustic soda. The downstream unit will manufacture polyglycol and polyol which are imported at present.
- Baroda Fibres and Chemicals Company's attempt to takeover Calico Mills, the one time flagship company of the Sarabhai Group, a sick unit referred to BIFR, with the hope of turning it around.

Backward and Forward Integration

Many units find an opportunity to use their own output to make other products. The advantage is that the output can be captively consumed to make better value-added products.

- Deepak Fertilizers and Chemicals has been the only producer of ammonia in the private sector. Since ammonia prices are administered by the government, the company was not able to maintain its profitability. It has therefore decided to set up a new project to manufacture ammonia-based fertilizers and thereby improve its profit potential.

Chance Factors

Sometimes investment opportunities are identified by sheer chance like in the following instance:

- Satya Prakash Mathur hit upon the idea of making domestic mixers when his wife complained that their imported mixer had succumbed to Indian conditions. He designed and manufactured 'Sumeet' mixers to cater to Indian kitchens.

Regulatory Framework and Policies

An entrepreneur scouting for suitable investment opportunities must familiarize himself with those economic legislations, governmental guidelines and policies that have a bearing on the identification and implementation of projects. Some of the legislations to be studied in this regard are: the Industries (Development and Regulation) Act, Income Tax Act and the Foreign Exchange Management Act. Besides these legislations, the Industrial policy statements, the guidelines governing foreign collaboration and investment, the incentives and subsidy schemes of the government, and the fiscal policy of the government also influence in the choice of projects.

The entrepreneur will also do well to look for distinct shifts in the priorities of the government in the recent years and assess the implications of such priorities for investments in different industries because other things being equal, a project which is in line with the governmental priorities is a better bet than a project which is not.

Now that the Indian economy is opening up and is on the way to globalization, foreign companies are also on the look out for investment opportunities in India.

- CRA Exploration Pvt. Ltd, an Australian mining company had submitted a proposal to explore the potential for diamonds in Kurnool and Ananthapur districts of Andhra Pradesh.

Preliminary Screening

The list of promising investment opportunities identified from various sources is first subjected to an analysis within the governmental regulatory framework to obtain a set of feasible investment opportunities that merit further consideration. It is a tedious task to undertake a detailed appraisal of each of these opportunities; hence the list has to be further narrowed down by evaluating the investments against certain specific criteria and selecting only those investments that are prima facie desirable. The criteria that are typically applied for the preliminary evaluation are:

- Compatibility with the Promoter.
- Compatibility with Governmental Priorities.
- Availability of Raw Materials and Utilities.
- Size of the Potential Market.
- Reasonableness of Cost.
- Risk Inherent in the Project.

These criteria are briefly examined here.

Compatibility with the Promoter

Any entrepreneur promoting a new project must ensure that the physical, financial, and human resources available at his disposal are adequate to meet the requirements of the project under review. Many diversification projects have failed because of the

incompatibility between the promoter's strengths and the project requirements. An example in this regard can be the unsuccessful attempt made by Brooke Bond to enter the two-wheeler automobile market by taking over Karnataka Scooters Limited. Similarly, Bush's entry into the Color TV market was not entirely successful and it has taken a decision to come back to the business it knows best – audio systems, though it still plans to manufacture Black & White TV sets.

Compatibility with Governmental Priorities

It is preferable that the project under review does not run counter to the governmental priorities. Besides it is also necessary to ensure that the promoter does not violate any governmental guidelines and/or legislations that have a bearing on the choice of investment. For example, a medium-scale unit cannot embark on a project or manufacturing tooth-powder because it is a product reserved for the small-scale sector. Likewise, a private corporate promoter cannot undertake an activity included in Schedule A of the Industrial Policy Resolution of 1956.

Availability of Inputs

The importance of this factor cannot be over-emphasized because business history is replete with instances of project failures on account of non-availability or scarcity of critical inputs. The various inputs, the availability of which needs to be verified, include raw materials, utilities, the technology involved etc. Apart from the availability of inputs, the costs involved in obtaining these inputs must also be examined because adverse variation in input costs can significantly affect the viability of the project. For example, the successive revaluations in the exchange value of yen over the last few years resulted in a sharp increase in the input costs of Maruti Udyog because it was importing auto-components in large numbers from Japan.

Size of the Potential Market

The size of the present domestic and export markets, the projected increase in consumption, the competitors' profiles and their market shares, the barriers to the entry of new units, the availability of substitute-products, and the pace of technological development in the industry concerned are some of the important factors to be assessed while subjecting the project to a preliminary evaluation.

Reasonableness of Cost

The cost structure of the product must be examined to see whether the desired profit margin can be attained with a competitive price. A break down of the product cost in terms of raw materials cost, labor cost, factory overheads, selling and distribution overheads, and after sales service costs is often helpful for this analysis.

Acceptability of Risk Level

The risk characterizing the project must be carefully assessed taking into account the different sources of risk like technological changes, availability of substitutes, competitive forces and cyclical effects.

Feasibility Study

Once a project opportunity is conceived and it is considered acceptable after preliminary screening, a detailed feasibility study has to be undertaken covering marketing, technical, financial, and economic aspects of the project. The study in the form of a Detailed Project Report (DPR) will contain fairly specific estimates of project cost, means of financing, schedules of implementation, estimates of profitability based on projected sales and production costs, estimates of cost and benefit streams in terms of cash flows, debt servicing capability[1] of the project and social profitability. The ultimate decision whether to go in for the project or not and how to finance it, is undertaken after this study which discloses whether the project is technically feasible, economically viable and financially sound.

1 Debt servicing capability refers to the ability of the project to generate sufficient cash flows to repay the debt taken to finance the project. This includes the principal along with the interest component.

IMPLEMENTATION

The implementation of a project i.e., translating the investment proposal into a concrete project is a highly complicated, time consuming, tension-fraught and risky affair. The various stages of implementation are:

- Construction of buildings and other civil works, erection and installation of machinery, preparation of blueprints and designs for project and plant engineering, selection of machineries and equipment.
- Negotiating for project finance with various financial institutions, entering into technical know-how agreements if necessary, entering into contracts for construction of buildings, supply of machinery, marketing of the company's products etc.
- Actual construction and installation of equipment.
- Training of engineers, technicians, workers, etc.
- Commissioning of plant and trial run.
- Commercial Production.

Project Delays

It is quite common for projects in India to be inordinately delayed due to a hoard of reasons like setting wrong target date, mistake in tender specifications due to which a lot of equipment cannot be fitted and goes waste, delay in arrival of materials, unskilled labor, etc. which lead to huge cost overruns and subsequent revision of project cost and the search for additional financing over and above the finance already sanctioned, which can in no way meet the cost overruns.

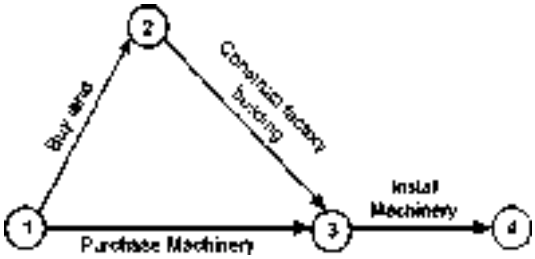
- The project of Ready Foods Limited to promote a 100% EOU (Export Oriented Unit) which will process and freeze fruits, vegetables, delicacies etc., for export was originally appraised by IDBI in November, 1991 and the project cost was estimated to be Rs.5,710 lakh. There was a cost escalation of about Rs.650 lakh due to delay in project implementation, which raised the project cost to Rs.6,360 lakh in March, 1993. The company had to raise Rs.6,360 lakh, which it proposed to do by issue of equity shares to the public and by taking loans, together amounting to Rs.5,465 lakh, the balance of Rs.895 lakh to be brought in by the promoters as their contribution.

For expeditious implementation of projects, it is helpful if,

- the projects are formulated adequately so that all aspects of the project are covered and targets are set on time;
- specific responsibilities are assigned to project managers for completing the project within the defined time-frame;
- network techniques like PERT (Program Evaluation Review Technique) and CPM (Critical Path Method) are used. These are ideal tools for project planning and control developed in the late 1950s. While CPM was developed for construction projects, PERT was developed for Research and Development projects. Both PERT and CPM present various activities of a project in the form of a network. A project may be split into various activities which have precedence relationships among them. This means that an activity in the project may require some other activities in it to be completed first before it can be started. Certain other activities can be carried on in tandem. When these activities are set out in the form of a network, it is called a network technique and this establishes the logical relationships between activities and also helps to analyze various project characteristics.

A simple network for the setting up of a plant can be shown as follows:

Figure 18.1



Note : The above network has been designed using the major activities in setting up a plant. Actually, each major activity has to be split up into several activities like calling for quotations, entering into contracts for building, machinery, finance etc., installation of electricity, water supply, etc.

Performance Review

Once the project has been implemented, the trial run is successful, and commercial production is started, a review of the actual performance with the performance projected in the feasibility study is required. This is an integral and vital part of project management because:

1. It throws light on how realistic were the assumptions underlying the project.
2. It is a valuable tool for decision-making in future.

Aspects of Project Appraisal

The appraisal of a project includes the following types of appraisal:

- Market Appraisal.
- Technical Appraisal.
- Financial Appraisal.
- Economic Appraisal.

MARKET APPRAISAL

The market appraisal is attempted to answer two important questions:

- What is the size of the total market for the proposed product or service?
- What will be the project's share of the total market?

Answers to both these questions are equally important because a dominant position in a rapidly shrinking market is certainly not a better proposition than a meagre share of a large market. To answer these questions, the market analyst compiles and analyzes the data relating to the following aspects[2]:

- Past and present consumption trends
- Present and prospective supply position
- Level of imports and exports
- Structure of competition
- Price and cross-elasticity of demand[3]
- Consumer requirements, and
- Production constraints.

Based on the available data, the market analyst estimates the future demand using an appropriate forecasting technique or a combination of forecasting techniques.

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2 The list is only illustrative and not exhaustive.

3 Price-elasticity of demand for a product refers to the responsiveness of the quantity demanded to a given change in its price. Cross-elasticity of demand on the other hand refers to the responsiveness of the quantity demanded of a product to a given change in the price of a related product. Cross-elasticity of demand needs to be analyzed for a product which has a close substitute or complementary product. For instance, tea and coffee being substitutes, an increase in the price of tea can result in an increase in the demand for coffee, and vice-versa. Likewise a steep hike in the price of petrol can have an adverse impact on the demand for cars in general, large cars in particular, and may have some impact even on the demand for tyres.

TECHNICAL APPRAISAL

As the name suggests, this appraisal is done to ensure that all technical aspects related to the successful commissioning of the project have been taken care of. The important issues considered in this appraisal are:

- Availability of the required quality and quantity of raw materials and other inputs;
- Availability of utilities like power, water, etc.;
- Appropriateness of the plant design and layout;
- The proposed technology vis-à-vis the alternative state-of-the-art technologies available;
- Optimality of the scale of operations;
- The technical specifications of the plant and machinery in relation to the proposed technology; and
- Assembly line balancing.

FINANCIAL APPRAISAL

The financial appraisal looks at return and risk characterising the project and examines whether the risk adjusted return exceeds the cost of financing the project. For this purpose, the financial analyst compiles data on the cost of project, means of financing, and projected revenues and costs. Based on this data, he works out the net cash flows expected from the project and appraises these cash flows in terms of various criteria of merit like payback, IRR, etc.

ECONOMIC APPRAISAL

In addition to financial appraisal, most of the projects sponsored by government authorities are subjected to a social cost benefit analysis (otherwise known as economic appraisal) to adjudge whether the project is desirable from the social point of view. Some of the issues considered in this analysis are:

- Impact of the project on the distribution of income in society,
- Impact of the project on the level of savings and investment in the society, and
- Contribution of the project towards socially desirable objectives like self-sufficiency, employment, etc.

For the successful implementation of a project, each step of the capital budgeting process is equally important. As students of Corporate Finance, we must be aware of all the aspects of Project Management, and be thoroughly proficient to appraise a project in relation to its financial aspects. This is discussed in detail in the next section.

SECTION 2

FINANCIAL APPRAISAL OF A PROJECT

The financial appraisal of a project can be viewed as a two-step procedure:

Step 1

Define the stream of cash flows (both inflows and outflows) associated with the project.

Step 2

Appraise the cash flow stream to determine whether the project is financially viable or not.

This section covers these two steps in greater detail. The first part of this section deals with the principles underlying measurement of cash flows and the second part discusses the criteria employed for appraising the financial viability. But before we discuss these aspects, we should be aware of the two important assumptions that underlie our discussions: (a) The cash flows occur only once a year, (b) The risk characterizing the project is similar to the risk complexion of the ongoing projects of the firm. While the first assumption is made to simplify the calculations, the second assumption is made for the sake of explanation.

DEFINING COSTS AND BENEFITS

The important principles underlying measurement of costs (outflows) and inflows (benefits) are as follows:

- All costs and benefits must be measured in terms of cash flows. This implies that all non-cash charges (expenses) like depreciation which are considered for the purpose of determining the profit after tax must be added back to arrive at the net cash flows for our purpose. (Illustrations 1, 2 and 3 of this chapter clarify this aspect.)
- Since the net cash flows relevant from the firm's point of view are what that accrue to the firm after paying tax, cash flows for the purpose of appraisal must be defined in post-tax terms.
- Usually the net cash flows are defined from the point of view of the suppliers of long-term funds[4] (i.e., suppliers of equity capital plus long-term loans).
- Interest on long-term loans must not be included for determining the net cash flows. The rationale for this principle is as follows: Since the net cash flows are defined from the point of view of suppliers of long-term funds, the post-tax cost of long-term funds will be used as the interest rate for discounting. The post-tax cost of long-term funds obviously includes the post-tax cost of long-term debt. Therefore if interest on long-term debt is considered for the purpose of determining the net cash flows, there will be an error of double-counting.
- The cash flows must be measured in incremental terms. In other words, the increments in the present levels of costs and benefits that occur on account of the adoption of the project are alone relevant for the purpose of determining the net cash flows.

Some implications of this principle are as follows:

- If the proposed project has a beneficial or detrimental impact on say, the other product lines of the firm, then such impact must be quantified and considered for ascertaining the net cash flows.
- Sunk costs must be ignored. For example, the cost of existing land must be ignored because money has already been sunk in it and no additional or incremental money is spent on it for the purposes of this project.
- Opportunity costs associated with the utilization of the resources available with the firm must be considered even though such utilization does not entail explicit cash outflows. Example, while the sunk cost of land is ignored, its opportunity cost i.e., the income it would have generated if it had been utilized for some other purpose or project must be considered.
- The share of the existing overhead costs which is to be borne by the end product(s) of the proposed project must be ignored.

The application of these principles in the measurement of the cash flows of a project are illustrated by the following illustrations:

Illustration 18.1

Anand, a chemical engineer with 15 years of experience, and Prakash, a pharmacy graduate with 18 years of experience, are evaluating a pharmaceutical formulation. They have estimated the total outlay on the project to be as follows:

Plant & Machinery	:	Rs.36 lakh
Working Capital	:	Rs.24 lakh
The proposed scheme of financing is :	:	
Equity Capital	:	Rs.16 lakh
Term Loan	:	Rs.26 lakh
Trade Credit	:	Rs.8 lakh
Working Capital Advance	:	Rs.10 lakh

4 Cash flows can also be defined either exclusively from the point of view of equity shareholders or from the view point of the suppliers of both long-term and short-term funds. Suppliers of short-term funds will include commercial banks which provide short-term loans and trade-creditors.

The project has an expected life of 10 years. Plant & Machinery will be depreciated at the rate of 33 1/3 percent per annum as per the written down value method. The expected annual sales would be Rs.80 lakh, and the cost of sales (including depreciation but excluding interest) is expected to be Rs.50 lakh per year. The tax rate of the company will be 50 percent. Term-loan will carry 14 percent interest and will be repayable in 5 equal annual installments, beginning from the end of the first year. Working capital advance will carry an interest rate of 17 percent and, thanks to the 'rollover' phenomenon, will have an indefinite maturity.

Define the cash flows for the first three years from the long-term funds point of view.

Note: the rates of interest quoted above are hypothetical and not in tune with present prevalent rates.

Solution

Net Cash Flows Relating to Long-term Funds

(Rs. in lakh)

Year		0	1	2	3
A.	Investment	(42.00)			
B.	Sales		80.00	80.00	80.00
C.	Operating costs (excluding depreciation)		38.00	42.00	44.67
D.	Depreciation		12.00	8.00	5.33
E.	Interest on working capital advance		1.70	1.70	1.70
F.	Profit before tax		28.30	28.30	28.30
G.	Tax		14.15	14.15	14.15
H.	Profit after tax		14.15	14.15	14.15
I.	Initial flow	(42.00)			
K.	Operating flow (= H + D) + I(1 – t)		26.15	22.15	19.48
L.	Net cash flow (= l + K)	(42.00)	26.15	22.15	19.48

Explanatory Notes

The investment outlay has to be considered from the point of view of the suppliers of long-term funds. In the given Illustration, we find that Rs.18 lakh out of the investment of Rs.24 lakh in current assets is financed by way of trade-credit and working capital advance. The difference of Rs.6 lakh is called the working-capital margin i.e., the contribution of the suppliers of long-term funds towards working capital. Therefore, the investment outlay relevant from the long-term funds point of view will be equal to investment in plant and machinery + working capital margin = Rs.42 lakh.

Since depreciation is a non-cash charge which has to be added to the profit after tax, this charge must be disclosed separately in the cash flow statement and not clubbed with other operating costs. Further, the depreciation charge to be considered here will be the tax-relevant charge. In other words, the depreciation must be computed in accordance with the method and rate(s) prescribed by the Income Tax Act, 1961.

While interest on long-term debt must be excluded for reasons discussed earlier, interest on short-term bank borrowings must be included in the cash flow statement.

In the Illustration discussed above, we have defined the cash flows only over the first three years of the project's life. But in practice cash flows are defined over the entire project life or over a specified time horizon (if the project life is too long). If the cash flows are defined over the entire life of the project, then the estimated

salvage value[5] of the investment in plant and machinery and the working capital must be considered for determining the net cash flow in the terminal year. If the cash flows are defined over a specified time horizon, a notional salvage value is taken into account in the final year of the time horizon.

The following illustration illustrates this point:

Illustration 18.2

A capital project involves the following outlays:

	(Rs. in lakh)
Plant and machinery	180
Working Capital	120

The proposed scheme of financing is as follows:

	(Rs. in lakh)
Equity	100
Long-term loans	104
Trade credit	36
Commercial banks	60

The project has a life of 10 years. Plant and machinery are depreciated at the rate of 15 percent per annum as per the written down value method. The expected annual net sales is Rs.350 lakh. Cost of sales (including depreciation, but excluding interest) is expected to be Rs.190 lakh a year. The tax rate of the company is 60 percent. At the end of 10 years plant and machinery will fetch a value equal to their book value and the investment in working capital will be fully recovered. The long-term loan carries an interest of 14 percent per annum. It is repayable in eight equal annual installments starting from the end of the third year. Short-term advance from commercial banks will be maintained at Rs.60 lakh; and will carry interest at 18 percent per annum. It will be fully liquidated after 10 years. Trade credit will also be maintained uniformly at Rs.36 lakh and will be fully paid back at the end of the tenth year.

Calculate the cash flow stream from the long-term funds point of view.

Solution

Cash Flows Relating to Long-Term Funds

(Rs. in lakh)

	0	1	2	3	4	5	6	7	8	9	10
A. Investment	(204.00)										
B. Sales		350.00	350.00	350.00	350.00	350.00	350.00	350.00	350.00	350.00	350.00
C. Cost of sales		163.00	167.05	170.49	173.42	175.91	178.02	179.82	181.34	182.64	183.75
D. Depreciation		27.00	22.95	19.51	16.58	14.09	11.98	10.18	8.66	7.36	6.25
E. Profit before interest and taxes		160.00	160.00	160.00	160.00	160.00	160.00	160.00	160.00	160.00	160.00
F. Interest on ST bank borrowing		10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
G. Profit before taxes		149.20	149.20	149.20	149.20	149.20	149.20	149.20	149.20	149.20	149.20
H. Tax		89.52	89.52	89.52	89.52	89.52	89.52	89.52	89.52	89.52	89.52
I. Profit after tax		59.68	59.68	59.68	59.68	59.68	59.68	59.68	59.68	59.68	59.68
J. Net salvage value of fixed assets											35.44
K. Net salvage of current assets											120.00
L. Retirement of trade credit											(36.00)
M. Payment of ST bank borrowing											(60.00)
N. Net Cash Flow = –A + I + D + J + K – L – M	(204.00)	86.68	82.63	79.19	76.26	73.77	71.66	69.86	68.34	67.04	125.37

5 Estimating the salvage values of capital equipment is indeed a complicated task given the absence of a secondary market for used capital equipments and the numerous factors that influence the estimation of salvage value which are difficult to predict.

Explanatory Notes

- Net salvage value of fixed assets will be equal to the salvage value of fixed assets less any income tax that may be payable on the excess of the salvage value over the book value. Likewise there will be a tax shield on the loss, if any, incurred at the time of disposing of the fixed assets. According to tax laws, the net salvage value of any individual item off plant and machinery has lost its significance and therefore for our purposes, we will ignore the impact of tax on the salvage value. In other words, we will take only the gross salvage value into consideration.
- The depreciation rate assumed in this problem is not indicative of the current rates in force.
- In working out the cash flows, deduction available for a new project under Section 80 I of the Income Tax Act has been ignored.
- Our Illustrations have so far been focused on estimating cash flows for a new project. The following illustration illustrates estimation of cash flows for a replacement project.

Illustration 18.3

Sandals Inc. is considering the purchase of a new leather cutting machine to replace an existing machine that has a book value of Rs.3,000 and can be sold for Rs.1,500. The estimated salvage value of the old machine in four years would be zero, and it is depreciated on a straight-line basis. The new machine will reduce costs (before tax) by Rs.7,000 per year, i.e., Rs.7,000 cash savings over the old machine. The new machine has a four year life, costs Rs.14,000 and can be sold for an expected amount of Rs.2,000 at the end of the fourth year. Assuming straight-line depreciation, and a 40% tax rate, define the cash flows associated with the investment. Assume that the straight-line method of depreciation is used for tax purposes.

Solution

Cash Flows Associated with Replacement Decision

(in Rs.)

Year		0	1	2	3	4
1.	Net investment in new machine	(12,500)				
2.	Savings in costs		7,000	7,000	7,000	7,000
3.	Incremental depreciation		2,250	2,250	2,250	2,250
4.	Pre-tax profits		4,750	4,750	4,750	4,750
5.	Taxes		1,900	1,900	1,900	1,900
6.	Post-tax profits		2,850	2,850	2,850	2,850
7.	Initial flow (= (1))	(12,500)				
8.	Operating flow (= (6) + (3))		5,100	5,100	5,100	5,100
9.	Terminal flow					2,000
10.	Net cash flow (= (7) + (8) + (9))	(12,500)	5,100	5,100	5,100	7,100

Working Notes

Computation of depreciation:

Existing leather-cutting machine

Rs.3,000/4 = Rs.750 per annum

New leather-cutting machine

Rs.12,000/4 = Rs.3,000 per annum

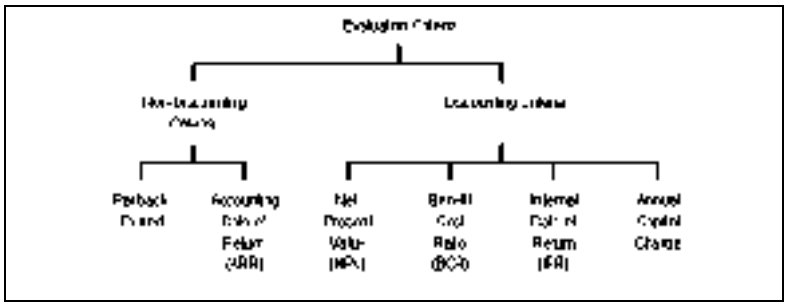
Incremental depreciation = Rs.2,250 per annum.

SECTION 3

APPRAISAL CRITERIA

Having defined the costs and the benefits associated with a project, we are now ready to examine whether the project is financially desirable or not. A number of criteria have been evolved for evaluating the financial desirability of a project. These criteria can be classified as follows:

Figure 18.2



Payback Period

The payback period measures the length of time required to recover the initial outlay in the project. For example, if a project with a life of 5 years involves an initial outlay of Rs.20 lakh and is expected to generate a constant annual inflow of Rs.8 lakh, the payback period of the project = 20/8 = 2.5 years. On the other hand if the project is expected to generate annual inflows of, say Rs.4 lakh, Rs.6 lakh, Rs.10 lakh, Rs.12 lakh and Rs.14 lakh over the 5 year period the payback period will be equal to 3 years because the sum of the cash inflows over the first three years is equal to the initial outlay.

In order to use the payback period as a decision rule for accepting or rejecting the projects, the firm has to decide upon an appropriate cut-off period. Projects with payback periods less than or equal to the cut-off period will be accepted and others will be rejected. The payback period is a widely used investment appraisal criterion for the following reasons:

- It is simple in both concept and application;
- It helps in weeding out risky projects by favoring only those projects which generate substantial inflows in earlier years.

The payback period criterion however suffers from the following serious shortcomings:

It fails to consider the time value of money, the importance of which has already been discussed at length.

- The cut-off period is chosen rather arbitrarily and applied uniformly for evaluating projects regardless of their life spans. Consequently the firm may accept too many short-lived projects and too few long-lived ones.
- Since the application of the payback criterion leads to discrimination against projects which generate substantial cash inflows in later years, the criterion cannot be considered as a measure of profitability.

To incorporate the time value of money in the calculation of payback period some firms compute what is called the “discounted payback period”. In other words, these firms discount the cash flows before they compute the payback period. For instance if a project involves an initial outlay of Rs.10 lakh, and is expected to generate a net annual inflow of Rs.4 lakh for the next 4 years, the discounted pay back will be that value of ‘n’ for which

$4 \times PVIFA(12, n) = 10$ .....(1)

Assuming the cost of funds to be 12 percent.

Equation (1) can be re-written as

PVIFA (12, n) = 2.5

From PVIFA Tables, we find that

PVIFA (12,3) = 2.402

PVIFA (12,4) = 3.037

Therefore, 'n' lies between 3 and 4 years and is approximately equal to 3.15 years[6]. We find the discounted pay back period is longer than the undiscounted pay back period which will be 2.5 years in this case.

Evaluating the discounted pay back period as an appraisal criterion, we find it to be a whisker better than the undiscounted pay back period. It considers the time value of money and thereby does not give an equal weight to all flows before the cut-off date. But it still suffers from the other shortcomings of the pay back period. This criterion also depends on the choice of an arbitrary cut-off date and ignores all cash flows after that date. In practice, companies do not give much importance to the payback period as an appraisal criteria.

Accounting Rate of Return

The accounting rate of return or the book rate of return is typically defined as follows:

Accounting Rate of Return (ARR) = Average Profit After Tax/Average book value of the investment.

To use it as an appraisal criterion, the ARR of a project is compared with the ARR of the firm as a whole or against some external yard-stick like the average rate of return for the industry as a whole. To illustrate the computation of ARR consider a project with the following data:

(Amount in Rs.)

Year	0	1	2	3
Investment	(90000)			
Sales Revenue		120000	100000	80000
Operating expenses (excluding depreciation)		60000	50000	40000
depreciation		30000	30000	30000
Annual Income		30000	20000	10000

Average annual income $= \frac{30,000+20,000+10,000}{3} = 20,000$

Average net book value of investment $= \frac{90,000+0}{2} = 45,000$

Accounting rate of return $= \frac{(20,000)}{(45,000)} x 100 = 44$ percent

The firm will accept the project if its target average rate of return is lower than 44 percent.

As an investment appraisal criterion, ARR has the following merits:

- Like payback criterion, ARR is simple both in concept and application. It appeals to businessmen who find the concept of rate of return familiar and easy to work with rather than absolute quantities.
- It considers the returns over the entire life of the project and therefore serves as a measure of profitability (unlike the payback period which is only a measure of capital recovery).

This criterion, however, suffers from several serious defects. First, this criterion ignores the time value of money. Put differently, it gives no allowance for the fact

6 $n = 3 + (4-3) x \frac{2.500 - 2.402}{(3.037 - 2.402)} = 3.15$

that immediate receipts are more valuable than the distant flows and results giving too much weight to the more distant flows. Second, the ARR depends on accounting income and not on the cash flows. Since cash flows and accounting income are often different and investment appraisal emphasizes cash flows, a profitability measure based on accounting income cannot be used as a reliable investment appraisal criterion. Finally, the firm using ARR as an appraisal criterion must decide on a yard-stick for judging a project and this decision is often arbitrary. Often firms use their current book-return as the yard-stick for comparison. In such cases if the current book return of a firm tends to be unusually high or low, then the firm can end up rejecting good projects or accepting bad projects.

NET PRESENT VALUE (NPV)

We have already discussed the concept of present value and the method of computing the present value in the chapter on time value of money. The net present value is equal to the present value of future cash flows and any immediate cash outflow. In the case of a project, the immediate cash flow will be investment (cash outflow) and the net present value will be therefore equal to the present value of future cash inflows minus the initial investment. The following illustration illustrates this point.

Illustration 18.4

Consider the project described in illustration 18.3. Compute the net present value of the project, if the cost of funds to the firm is 12 percent.

Solution

The net cash flows of the project and their present values are as follows:

Year	1	2	3	4
Net cash flow (Rs.)	5100	5100	5100	7100
PVIF @ k = 12%	0.893	0.797	0.712	0.636
Present value (Rs.)	4554	4065	3631	4516

Net present value

= (–12,500) + (4,554 + 4,065 + 3,631 + 4,516)

= Rs. (–12,500 + 16,766)

= Rs.4,266

The decision rule based on the NPV criterion is obvious. A project will be accepted if its NPV is positive and rejected if its NPV is negative. Rarely in real life situations, we encounter a project with NPV exactly equal to zero. If it happens, theoretically speaking, the decision-maker is supposed to be either indifferent in accepting or rejecting the project. But in practice, NPV in the neighborhood of zero, calls for a close review of the projections made in respect of such parameters that are critical to the viability of the project because even minor adverse variations can mar the viability of such marginally viable projects.

The NPV is a conceptually sound criterion of investment appraisal because it takes into account the time value of money and considers the cash flow stream in its entirety. Since net present value represents the contribution to the wealth of the shareholders, maximizing NPV is congruent with the objective of investment decision making viz., maximization of shareholders' wealth. The only problem in applying this criterion appears to be the difficulty in comprehending the concept per se. Most non-financial executives and businessmen find 'Return on Capital Employed' or 'Average Rate of Return' easy to interpret compared to absolute values like the NPV.

Benefit-Cost Ratio (BCR)

The benefit-cost ratio (or the Profitability Index) is defined as follows:

$$BCR = \frac{PV}{I}$$

where

BCR = Benefit Cost Ratio

PV = Present Value of Future Cash Flows

and I = Initial Investment

A variant of the benefit-cost ratio is the net benefit-cost ratio (NBCR) which is defined as:

$$NBCR = NBCR = \frac{NPV}{I}$$

$$= \frac{PV - I}{I}$$

$$= \frac{PV}{I} - 1$$

$$= BCR - 1$$

The BCR and NBCR for the project described in illustration 18.4 will be:

BCR = 16,766/12,500 = 1.34

NBCR = 4,266/12,500 = 0.34

The decision-rules based on the BCR (or alternatively the NBCR) criterion will be as follows:

If -	Decision Rule
BCR > 1 (NBCR > 0)	Accept the project
BCR < 1 (NBCR < 0)	Reject the project

Since the BCR measures the present value per rupee of outlay, it is considered to be a useful criterion for ranking a set of projects in the order of decreasingly efficient use of capital. But there are two serious limitations inhibiting the use of this criterion. First, it provides no means for aggregating several smaller projects into a package that can be compared with a large project. Second, when the investment outlay is spread over more than one period, this criterion cannot be used. The following illustration illustrates the first limitation.

Illustration 18.5

Zeta Limited is considering 4 projects – A, B, C, and D with the following characteristics:

	Initial Investment (Year 0)	Annual Net Cash Flow (Years 1 to 5)
A	(20)	7.5
B	(4.5)	1.5
C	(7)	2.5
D	(8)	3.5

The funds available for investment are limited to Rs.20 lakh and the cost of funds to the firm is 14 percent. Rank the 4 projects in terms of the NPV and BCR criteria. Which project(s) will you recommend given the limited supply of funds?

Solution

The NPVs of the 4 projects are:

Project	NPV (Rs. in lakh)		Rank
A	7.5 x PVIFA(14,5) – 20 = (7.5 x 3.433) – 20	= 5.75	I
B	(1.5 x 3.433) – 4.5	= 0.65	IV
C	(2.5 x 3.433) – 7	= 1.58	III
D	(3.5 x 3.433) – 8	= 4.02	II

The BCR of the 4 projects are:

Project	BCR	Rank
A	25.75/20 = 1.27	II
B	5.15/4.5 = 1.14	IV
C	8.58/7 = 1.23	III
D	12.02/8 = 1.50	I

Based on the NPV and BCR criteria, all 4 projects are acceptable because NPV is positive and BCR is greater than one for each project. But all 4 projects cannot be taken by the firm because of the limited availability of funds. Either Zeta has to accept project A or a package consisting of projects, B, C and D but not both. The decision will depend upon which option maximizes the shareholders' wealth. In this sort of a decision-making situation, the BCR becomes inapplicable because there is no way by which we can aggregate the BCRs of projects B, C and D. On the other hand NPVs of projects B, C, and D can be aggregated and compared with the NPV of project A to arrive at a decision.

NPV (B + C + D) = NPV (B) + NPV (C) + NPV (D) = 0.65 + 1.58 + 4.02 = 6.25 which is more than NPV (A). Therefore the package comprising projects B, C and D must be accepted.

INTERNAL RATE OF RETURN

The internal rate of return is that rate of interest at which the net present value of a project is equal to zero, or in other words, it is the rate which equates the present value of the cash inflows to the present value of the cash outflows. While under NPV method the rate of discounting is known (the firm's cost of capital), under IRR this rate which makes NPV zero has to be found out. To illustrate this concept, let us consider the following illustration.

Illustration 18.6

A project has the following pattern of cash flows:

Year	Cash flow (Rs. in lakh)
0	(10)
1	5
2	5
3	3.08
4	1.20

What is the IRR of this project?

Solution

To determine the IRR, we have to compute the NPV of the project for different rates of interest until we find that rate of interest at which the NPV of the project is equal to zero or sufficiently close to zero. To reduce the number of iterations involved in this trial and error process, we can use the following short-cut procedure:

Step 1

Find the average annual net cash flow based on the given future net cash flows. In our illustration, the average annual net cash flow will be equal to:

(5 + 5 + 3.08 + 1.20)/4 = 3.57

Step 2

Divide the initial outlay by the average annual net cash flow i.e., 10/3.57 = 2.801

Step 3

From the PVIFA table find that interest rate at which the present value of an annuity of Re.1 will be nearly equal to 2.801 in 4 years i.e., the duration of the project. In our case, this rate of interest will be equal to 15%.

We use 15% as the initial value for starting the trial and error process and keep trying at successively higher rates of interest until we get an interest rate at which the NPV is marginally above zero and an interest rate at which the NPV is marginally below zero. Now we know that IRR lies between the two rates of interest and using a linear approximation, we can determine the approximate value of the IRR. In the case of our project,

the NPV at r = 15% will be equal to:

$$-10 + (5 \times 0.870) + (5 \times 0.756) + (3.08 \times 0.658) + (1.2 \times 0.572) = 0.84$$

NPV at r = 16% will be equal to:

$$-10 + (5 \times 0.862) + (5 \times 0.743) + (3.08 \times 0.641) + (1.2 \times 0.552) = 0.66$$

NPV at r = 18% will be equal to:

$$-10 + (5+9/ \times 0.848) + (5 \times 0.719) + (3.08 \times 0.609) + (1.20 \times 0.516) = 0.33$$

NPV at r = 20% will be equal to:

$$-10 + (5 \times 0.833) + (5 \times 0.694) + (3.08 \times 0.579) + (1.20 \times 0.482) = 0$$

We find that at r = 20%, the NPV is zero and therefore the IRR of the project is 20%.

To use IRR as an appraisal criterion, we require information on the cost of capital or funds employed in the project. If we define IRR as ‘r’ and cost of funds employed as ‘k’, then the decision rule based on IRR will be: Accept the project if ‘r’ is greater than k and reject the project if r is less than k. (If r = k, it is a matter of indifference).

IRR is a popular method of investment appraisal and has a number of merits like:

- It takes into account the time value of money.
- It considers the cash flow stream over the entire investment horizon.
- Like ARR, it makes sense to businessmen who prefer to think in terms of rate of return on capital employed.

This criterion however suffers from the following limitations:

IRR is uniquely defined only for a project whose cash flow pattern is characterized by cash outflow(s) followed by cash inflows (such projects are called simple investments). If the cash flow stream has one or more cash outflows interspersed with cash inflows, there can be multiple internal rates of return. This point can be clarified with the help of the following table no: 18.1 where four projects with different patterns of cash flows are given:

Table: 18.1

(Rs. in lakh)

Project	Cash Flow Stream (Rs.)				
	Year 0	Year 1	Year 2	Year 3	Year 4
A	–20	5	10	15	15
B	–10	–10	15	15	15
C	–10	5	–10	20	20
D	–10	15	10	–5	20

- Projects A and B are simple investments and therefore will have unique IRR values. But projects C and D can have multiple internal rates of return because their cash inflows and outflows are interspersed. For such projects, IRR cannot be a meaningful criterion of appraisal.
- The IRR criterion can be misleading when the decision-maker has to choose between mutually exclusive projects that differ significantly in terms of outlays.

In spite of these defects, IRR is still the best criterion today to appraise a project financially. Financial Institutions insist that projects having substantial outlay specially in the medium and large scale sectors must show the computation of IRR in the Detailed Project Report, which they appraise before sanctioning financial assistance.

Annual Capital Charge

This appraisal criterion is used for evaluating mutually exclusive projects or alternatives which provide similar service but have differing patterns of costs and often unequal life spans, e.g., choosing between fork-lift transportation and conveyor-belt transportation.

The steps involved in computing the annual capital charge are as follows:

Step 1

Determine the present value of the initial investment and operating costs using the cost of capital (k) as the discount rate.

Step 2

Divide the present value by PVIFA (k,n) where n represents the life span of the project. The quotient is defined as the annual capital charge or the equivalent annual cost. Once the annual capital charge for the various alternatives are defined, the alternative which has the minimum annual capital charge is selected.

Illustration 18.7

Hindustan Forge Limited is evaluating two alternative systems: A and B, for internal transportation. While the two systems serve the same purpose, system A has a life of 7 years and system B has a life of 5 years. The initial outlay and operating costs (in Rs.) associated with these systems are:

Year	A	B
0	10,00,000	8,00,000
1	1,00,000	75,000
2	1,25,000	1,00,000
3	1,50,000	1,20,000
4	1,75,000	1,40,000
5	2,00,000	1,00,000
6	2,25,000	
7	2,00,000	

Calculate the annual capital charge associated with these two systems, if the cost of capital is 12 percent. (You can assume that the net salvage values of the two systems at the end of their economic lives will be zero.)

Solution

Present value of costs associated with system A

= Rs.10,00,000 + (1,00,000 x 0.893) + (1,25,000 x 0.797) (1,50,000 x 0.712) + (1,75,000 x 0.636) + (2,00,000 x 0.567) + (2,25,000 x 0.507) + (2,00,000 x 0.452) = Rs.17,24,900

Annual capital charge associated with system A

$$= \frac{17,24,900}{\text{PVIFA}(12,7)} = \frac{17,24,900}{4.564} = \text{Rs.}3,77,936$$

Present value of costs associated with system B

= Rs.8,00,000 + (75,000 × 0.893) + (1,00,000 × 0.797) + (1,20,000 × 0.712) + (1,40,000 × 0.636) + (1,00,000 × 0.567) = Rs.11,77,855

Annual capital charge associated with system B

$$= \frac{11,77,855}{\text{PVIFA}(12,5)} = \frac{11,77,855}{3.605} = \text{Rs.}3,26,728$$

Since the annual capital charge associated with system B is lower than that of system A, system B is preferred to system A.

A wide variety of measures are used in practice for appraising investments. But whatever method is used, the appraisal must be carried out in explicit, well-defined, preferably standardized terms and should be based on sound economic logic.

SECTION 4

INFRASTRUCTURE DECISIONS AND FINANCING

The capital budgeting decisions are long-term in nature involving huge amount of capital and risk. We have seen the significance of identification of potential investment opportunities, conducting feasibility study (both technical and economic), assessing constraints before implementing and lastly review performance or project appraisal in terms of market, technical, financial and economic aspects during project implementation. Infrastructure means the support services in the real economy. These support services are aids to economic development; they play a vital role in development of the economy and help in sustaining real growth. The capital budgeting decisions in infrastructure are quite complicated as the factors one need to consider for evaluation are distinctly different when compared to a normal project evaluation. As it involves high risk, low return, huge capital, long gestation period, the entity undertaking the infrastructure project needs to analyze these aspects very carefully.

Reasons for Poor Infrastructure in India

The following are the reasons for the under development of infrastructure in India.

Infrastructure is highly capital-intensive and requires the kind of resources which cannot be generated domestically in the country.

- Since the gestation period is very long and the returns are not commensurate with the high level of risk (not even in a medium-term perspective), active participation of private sector in infrastructure development is usually low.
- Banks with their short-term nature of liabilities are precluded from participating in infrastructural financing due to long gestation period of the projects since it results in Asset-Liability Mismatch.
- Major financial institutions like LIC, GIC and the Provident Funds are not channelizing their funds into infrastructure segment.
- Lack of innovative instruments for financing infrastructure is another major constraint, inhibiting the growth of infrastructure in the country.

IMPLICATIONS

- Poor infrastructure distorts the level playing field for Indian corporates and results in a competitive disadvantage when compared to the foreign counterparts.
- Lack of infrastructural facilities leads to delays in project implementation and consequently to time and cost overruns in a project.
- Poor infrastructure forces the consumers to pay more for products than what they should be actually paying.
- Poor infrastructure hinders the flow of Foreign Direct Investment into the country.

Financing Infrastructure

As discussed above, the financing of infrastructure projects is associated with high risk, low returns with a long gestation period. Hence, the financier would look to the optimal combination of debt, equity, securitization, risk sharing and government guarantees.

The need for developing infrastructure in the country was recognized by the government, and a Committee, headed by Dr. Rakesh Mohan, was set up to report on infrastructural conditions in India. The Committee opined that commercialization of infrastructure is the only viable and long-term solution to the problems associated with the traditional methods of infrastructural development. One of the important suggestions given by the Committee is to set up a regulatory body. It also recommended that government participation in private financed infrastructure projects should go beyond mere guarantees and they should also take equity positions in the projects.

INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION

Following the recommendations of the Rakesh Mohan Committee, the Infrastructure Development Finance Corporation (IDFC) was set-up in the year 1997 with a corpus of Rs.1,600 crore by the Government of India and RBI with other domestic and foreign institutions as equity participants.

Key Activities

IDFC provides underwriting facilities, refinance facilities and take-out financing. Take-out financing involves an institution like IDFC promising to take over the loan extended by another institution after a prescribed time-frame. As a part of its fee-based activities, it also extends loan syndication, partial credit guarantees and fund-management. Apart from the above, its focus is on providing inputs to policy reforms to mitigate constraints faced by infrastructure projects besides extending financial intermediation for such projects.

As a part of its assignments, IDFC has already signed Memorandum of Understanding (MOU) with SBI for Rs.300 crore, Bharati Telecom has already availed Rs.25 crore as take-out financing and IDFC also committed for four projects in power sector, three in road schemes and two bridges.

The classification of IDFC as a public FI will help the newly-formed infrastructure institution to access long-term funds from pension funds and insurance companies. The setting up of IDFC is definitely a step in the right direction, but, the small capital base of the institution becomes a constraint in the fund-based financing of infrastructure. If we consider the huge fund requirements in power, telecom and transportation sectors, the fund-based support of IDFC is minuscule to make an impact. A single IDFC can do little to improve the state of infrastructure in India.

Future of Infrastructure

The infrastructure segment till eighties was considered as government monopoly. Private sector was viewed as having no interest in these projects due to the above discussed reasons. As we are aware, poor infrastructure is the biggest stumbling block for capital investments in India. Experts opine that all developmental plans reach a dead end because of poor infrastructure. Another trend emerging in infrastructure financing is the role of government as a facilitator in infrastructural

financing. Broadly, this takes the form of support through venture capital and guarantees in the initial stages, providing a stable regulatory and transparent policy framework as well as developing the domestic capital markets for financing infrastructure. There are two basic issues which need to be addressed.

1. An infrastructure project does not become acceptable to an investor from the finance point of view. However, there are considerable social benefits involved in it and hence government has a significant role in ensuring that a project becomes acceptable.
2. Since the returns are low, the cost of funds also has to be low. The cost of funds becomes high due to the nature of long-term funds required. Hence, a market mechanism needs to be developed for raising short-term funds at cheaper rates which can be used for funding infrastructure projects. However, market making becomes necessary to ensure liquidity for investors to enter and exit at their will. Thus a maturity intermediation is necessary for the same.

SUMMARY

- Capital expenditure decisions occupy an important place in corporate finance. The huge sums involved and the irreversible and long-term nature of the decisions make them very important. Investment decisions begin with identification of the investment opportunities, followed by preliminary screening, feasibility study, implementation and performance review.
- Six appraisal criteria are used for evaluating the financial viability of a project. While the first two are simple additive measures, the latter methods make use of discounted cashflow techniques.
- The payback period of an investment enables the manager to calculate the number of years required to recover the initial capital outlay in the project. Although this is a rough measure of liquidity of the project, it makes a poor job of measuring profitability as it ignores cashflows occurring after the payback period and the time value of money using a crudely determined subjective cut-off point to appraise a project.
- The account rate of return is the ratio of average profit after tax to average book value of the investment. Akin to payback period, the criterion ignores the time value of money. Although it considers the returns over the entire life of the project and therefore is a measure of profitability, it depends largely on accounting income rather than cashflows. In addition, any company using ARR needs to determine a yardstick to compare the returns of any project. In most cases, the yardsticks themselves suffer from subjectivity.
- The net present value is the present value of the project's net cash flows less the initial outflow. A project is acceptable only when its NPV is greater than or equal to zero. Benefit cost ratio measures the present value of a rupee of outflow and is very useful in ranking projects in the order of the efficient usage of capital. If a project's BCR is greater than or equal to 1, the project can be accepted.
- The internal rate of return is the discount rate that equates the present value of the net cashflows of the project with the initial cash outlay. Any project is acceptable if the internal rate of return is greater than or equal to the required rate of return, usually the company's cost of capital. Annual capital charge is used for evaluating mutually exclusive projects or alternatives that are not comparable in terms of life spans or cost patterns. In this case, the project that has a lower annual capital charge is preferable to the one that has a higher charge.

APPENDIX

Interest Rate Tables

Table 1 : Future Value Interest Factor

n/k	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130
2	1.020	1.040	1.061	1.082	1.102	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.335
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.887	5.535
15	1.161	1.346	1.558	1.801	2.097	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.544	7.690	9.024
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263	8.613	10.197
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.728	8.062	9.646	11.523
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835	13.585	17.000	21.231
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449	22.892	29.960	39.116

Table 1 : Future Value Interest Factor

n/k	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.140	1.150	1.160	1.170	1.180	1.190	1.200	1.240	1.280	1.320	1.360	1.400
2	1.300	1.322	1.346	1.369	1.392	1.416	1.440	1.538	1.638	1.742	1.850	1.960
3	1.482	1.521	1.561	1.602	1.643	1.685	1.728	1.907	2.097	2.300	2.515	2.744
4	1.689	1.749	1.811	1.874	1.939	2.005	2.074	2.364	2.684	3.036	3.421	3.842
5	1.925	2.011	2.100	2.192	2.288	2.386	2.488	2.392	3.436	4.007	4.653	5.378
6	2.195	2.313	2.436	2.565	2.700	2.840	2.986	3.635	4.398	5.290	6.328	7.530
7	2.502	2.660	2.826	3.001	3.185	3.379	3.583	4.508	5.629	6.983	8.605	10.541
8	2.853	3.059	3.278	3.511	3.759	4.021	4.300	5.590	7.206	9.217	11.703	14.758
9	3.252	3.518	3.803	4.108	4.435	4.785	5.160	6.931	9.223	12.166	15.917	20.661
10	3.707	4.046	4.411	4.807	5.234	5.695	6.192	8.594	11.806	16.060	21.647	28.925
11	4.226	4.652	5.117	5.624	6.176	6.777	7.430	10.657	15.112	21.199	29.439	40.496
12	4.818	5.350	5.936	6.580	7.288	8.064	8.916	13.215	19.343	27.983	40.037	56.694
13	5.492	6.153	6.886	7.699	8.599	9.596	10.699	16.386	24.759	36.937	54.451	79.372
14	6.261	7.076	7.988	9.007	10.147	11.420	12.839	20.319	31.961	48.757	74.053	111.120
15	7.138	8.137	9.266	10.539	11.974	13.590	15.407	25.196	40.565	64.359	100.712	155.568
16	8.137	9.358	10.748	12.330	14.129	16.172	18.488	31.243	51.923	84.954	136.969	217.795
17	9.276	10.761	12.468	14.426	16.672	19.244	22.186	38.741	66.461	112.139	186.278	304.914
18	10.575	12.375	14.463	16.879	19.673	22.901	26.623	48.039	85.071	148.023	253.338	426.879
19	12.056	14.232	16.777	19.748	23.214	27.252	31.948	59.568	108.890	195.391	344.540	597.630
20	13.743	16.367	19.461	23.106	27.393	32.429	38.338	73.864	139.380	257.916	468.574	836.683
25	26.462	32.919	40.874	50.658	62.669	77.388	95.396	216.542	478.905	1033.590	2180.081	4499.880
30	50.950	66.212	85.850	111.065	143.371	184.675	237.376	634.820	1645.504	4142.075	10143.019	24201.432

Table 2 : Future Value Interest Factor for an Annuity

n/k	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100	2.110	2.120	2.130
3	3.030	3.060	3.091	3.122	3.152	3.184	3.215	3.246	3.278	3.310	3.342	3.374	3.407
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641	4.710	4.779	4.850
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105	6.228	6.353	6.480
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716	7.913	8.115	8.323
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487	9.783	10.089	10.405
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436	11.859	12.300	12.757
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164	14.776	15.416
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561	20.655	21.814
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	21.141	21.384	22.713	24.133	25.650
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975	30.095	32.393	34.883
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950	39.190	42.753	46.672
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545	44.501	48.884	53.739
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301	45.599	50.396	55.750	61.725
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939	63.440	70.749
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275	64.203	72.052	80.947
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701	98.347	114.413	133.334	155.620
30	34.785	40.568	47.575	56.805	66.439	79.058	94.461	113.283	136.308	164.494	199.021	241.333	293.199

Table 2 : Future Value Interest Factor for an Annuity

n/k	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.140	2.150	2.160	2.170	2.180	2.190	2.200	2.240	2.280	2.320	2.360	2.400
3	3.440	3.473	3.506	3.539	3.572	3.606	3.640	3.778	3.918	4.062	4.210	4.360
4	4.921	4.993	5.066	5.141	5.215	5.291	5.368	5.684	6.016	6.362	6.725	7.104
5	6.610	6.742	6.877	7.014	7.154	7.297	7.442	8.048	8.700	9.398	10.146	10.946
6	8.536	8.754	8.977	9.207	9.442	9.683	9.930	10.980	12.136	13.406	14.799	16.324
7	10.730	11.067	11.414	11.772	12.142	12.523	12.916	14.615	16.534	18.696	21.126	23.853
8	13.233	13.727	14.240	14.773	15.327	15.902	16.499	19.123	22.163	25.678	29.732	34.395
9	16.085	16.786	17.518	18.285	19.086	19.923	20.799	24.712	29.369	34.895	41.435	49.153
10	19.337	20.304	21.321	22.393	23.521	24.709	25.959	31.643	38.592	47.062	57.352	69.814
11	23.044	24.349	25.733	27.200	28.755	30.404	32.150	40.238	50.399	63.122	78.998	98.739
12	27.271	29.002	30.850	32.824	34.931	37.180	39.580	50.985	65.510	84.320	108.437	139.235
13	32.089	34.352	36.786	39.404	42.219	45.244	48.497	64.110	84.853	112.303	148.475	195.929
14	37.581	40.505	43.672	47.103	50.818	54.841	59.196	80.496	109.612	149.240	202.926	275.300
15	43.842	47.580	51.660	56.110	60.965	66.261	72.035	100.815	141.303	197.997	276.979	386.420
16	50.980	55.717	60.925	66.649	72.939	79.850	87.442	126.011	181.868	262.356	377.692	541.988
17	59.118	65.075	71.673	78.979	87.068	96.022	105.931	157.253	233.791	347.310	514.661	759.784
18	68.394	75.836	84.141	93.406	103.740	115.266	128.117	195.994	300.252	459.449	700.939	1064.697
19	78.969	88.212	98.603	110.285	123.414	138.166	154.740	244.033	385.323	607.472	954.277	1491.576
20	91.025	102.44	115.380	130.033	146.628	165.418	186.688	303.601	494.213	802.863	1298.817	2089.206
25	181.871	212.793	249.214	292.105	342.603	402.042	371.981	898.092	1706.803	3226.844	6053.004	11247.199
30	356.787	434.745	530.321	647.439	790.948	966.712	1181.882	2640.916	5873.231	12940.859	28172.276	60501.081

Table 3 : Present Value Interest Factor

n/k	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693
4	0.961	0.924	0.889	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543
6	0.942	0.888	0.838	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376
9	0.914	0.873	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361	0.333
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287	0.261
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229	0.204
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.181	0.205
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.160
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146	0.125
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130	0.111
19	0.828	0.686	0.570	0.475	0.396	0.331	0.276	0.232	0.194	0.164	0.138	0.166	0.098
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059	0.047
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033	0.026

Table 3 : Present Value Interest Factor

n/k	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.806	0.781	0.758	0.735	0.714
2	0.769	0.756	0.743	0.731	0.718	0.706	0.694	0.650	0.610	0.574	0.541	0.510
3	0.675	0.658	0.641	0.624	0.609	0.593	0.579	0.524	0.477	0.435	0.398	0.364
4	0.592	0.572	0.552	0.534	0.516	0.499	0.482	0.423	0.373	0.329	0.292	0.260
5	0.519	0.497	0.476	0.456	0.437	0.419	0.402	0.341	0.291	0.250	0.215	0.186
6	0.456	0.432	0.410	0.390	0.370	0.352	0.335	0.275	0.227	0.189	0.158	0.133
7	0.400	0.376	0.354	0.333	0.314	0.296	0.279	0.222	0.178	0.143	0.116	0.095
8	0.351	0.327	0.305	0.285	0.266	0.249	0.233	0.179	0.139	0.108	0.085	0.068
9	0.308	0.284	0.263	0.243	0.226	0.209	0.194	0.144	0.108	0.082	0.063	0.048
10	0.270	0.247	0.227	0.208	0.191	0.176	0.162	0.116	0.085	0.062	0.046	0.035
11	0.237	0.215	0.195	0.178	0.162	0.148	0.135	0.094	0.066	0.047	0.034	0.025
12	0.208	0.187	0.168	0.152	0.137	0.124	0.112	0.076	0.052	0.036	0.025	0.018
13	0.182	0.163	0.145	0.130	0.116	0.104	0.093	0.061	0.040	0.027	0.018	0.013
14	0.160	0.141	0.125	0.111	0.099	0.088	0.078	0.049	0.032	0.021	0.014	0.009
15	0.140	0.123	0.108	0.095	0.084	0.074	0.065	0.040	0.025	0.016	0.010	0.006
16	0.123	0.107	0.093	0.081	0.071	0.062	0.054	0.032	0.019	0.012	0.005	0.007
17	0.108	0.093	0.080	0.069	0.060	0.052	0.045	0.026	0.015	0.009	0.005	0.003
18	0.095	0.081	0.069	0.059	0.051	0.044	0.038	0.021	0.012	0.007	0.004	0.002
19	0.083	0.070	0.060	0.051	0.043	0.037	0.031	0.017	0.009	0.005	0.003	0.002
20	0.073	0.061	0.051	0.043	0.037	0.031	0.026	0.014	0.007	0.004	0.002	0.001
25	0.038	0.030	0.024	0.020	0.016	0.013	0.010	0.005	0.002	0.001	0.000	0.000
30	0.020	0.015	0.012	0.009	0.007	0.005	0.004	0.002	0.001	0.000	0.000	0.000

Table 4 :
Present Value Interest Factor for an Annuity

$$\mathbf{PVFIA_{(k,n)}} = \frac{1 - \frac{1}{(1+k)^n}}{k}$$

n/k	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111	3.998
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	5.564	4.423
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	3.335	5.146	4.968	4.799
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424	6.122
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606	7.191	6.811	6.462
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824	7.379	6.974	6.604
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120	6.729
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250	6.840
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366	6.938
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469	7.025
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843	7.330
30	25.808	22.397	19.600	17.292	15.373	13.765	12.409	11.258	10.274	9.427	8.694	8.055	7.496

Table 4 :
Present Value Interest Factor for an Annuity

n/k	14%	15%	16%	17%	18%	19%	20%	24%	28%	32%	36%	40%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.806	0.781	0.758	0.735	0.714
2	1.647	1.626	1.605	1.585	1.566	1.547	1.528	1.457	1.392	1.332	1.276	1.224
3	2.322	2.283	2.246	2.210	2.174	2.140	2.106	1.981	1.868	1.766	1.674	1.589
4	2.914	2.855	2.798	2.743	2.690	2.639	2.589	2.404	2.241	2.096	1.966	1.849
5	3.433	3.352	3.274	3.199	3.127	3.058	2.991	2.745	2.532	2.345	2.181	2.035
6	3.889	3.784	3.685	3.589	3.498	3.410	3.326	3.020	2.759	2.534	2.339	2.168
7	4.288	4.160	4.039	3.922	3.812	3.706	3.605	3.242	2.937	2.678	2.455	2.263
8	4.639	4.487	4.344	4.207	4.078	3.954	3.837	3.421	3.076	2.786	2.540	2.113
9	4.946	4.772	4.607	4.451	4.303	4.163	4.031	3.566	3.184	2.868	2.603	2.379
10	5.216	5.019	4.833	4.659	4.494	4.339	4.193	3.682	3.269	2.930	2.650	2.414
11	5.453	5.234	5.029	4.836	4.656	4.486	4.327	3.776	3.335	2.978	2.683	2.438
12	5.660	5.421	5.197	4.988	4.793	4.611	4.439	3.851	3.387	3.013	2.708	2.456
13	5.842	5.583	5.342	5.118	4.910	4.715	4.533	3.912	3.427	3.040	2.727	2.469
14	6.002	5.724	5.468	5.229	5.008	4.802	4.611	3.962	3.459	3.061	2.740	2.478
15	6.142	5.847	5.575	5.324	5.092	4.876	4.675	4.001	3.483	3.076	2.750	2.484
16	6.265	5.954	5.669	5.405	5.162	4.938	4.730	4.033	3.503	3.088	2.758	2.489
17	6.373	6.047	5.749	5.475	5.222	4.990	4.775	4.059	3.518	3.097	2.763	2.492
18	6.467	6.128	5.818	5.534	5.273	5.033	4.812	4.080	3.529	3.104	2.767	2.494
19	6.550	6.198	5.877	4.584	5.316	5.070	4.844	4.097	3.539	3.109	2.770	2.496
20	6.623	6.259	5.929	5.628	5.353	5.101	4.870	4.110	3.546	3.113	2.772	2.497
25	6.873	5.464	5.097	5.766	5.467	5.195	4.948	4.147	3.564	3.122	2.776	2.499
30	7.003	6.566	6.177	5.829	5.517	5.235	4.979	4.160	3.569	3.124	2.778	2.500

Glossary

ABC Analysis : A selective approach to inventory control which calls for a greater concentration on inventory items accounting for the bulk of usage value.

Accounting Rate of Return : The rate of return on an investment defined as profit after tax divided by book value of investment. It is also referred to as the average rate of return.

Acid Test Ratio : A liquidity measure which is defined as: (current assets – inventories)/current liabilities.

Ageing Schedule : A statement showing age-wise distribution of debtors (accounts receivable).

Arbitrage : The act of obtaining risk-free profits by simultaneously buying and selling similar instruments in different markets is known as 'arbitrage'. The person who does arbitraging is known as 'arbitrageur'.

Average Collection Period : The ratio of receivables to average credit sales per day.

Balance Sheet Method : A method for forecasting future financing requirement or available funds based on projected income statement and balance sheet.

Bear Market : A market dominated by bears. (A bear is an operator who has a pessimistic view of future).

Bearer Security : A security for which possession is the primary evidence of ownership.

Blue Chip Company : Large, stable, well-established company.

Bond : An instrument for long-term debt.

Book Value Weights : The percentage of financing provided by different sources as measured by their book values from the company's balance sheet.

Bridge Loan : Temporary finance provided to a project until long-term arrangements are made.

Broker : A person (agency) who arranges the purchase and sale of an asset by acting as an intermediary between the purchaser and the seller.

Budget : A plan expressed usually in financial terms.

Budget Factor : A cost factor used to determine the amount of cost allowed under given operating conditions. It is used especially in a system of flexible budgeting for cost control purposes.

Business Risk : The risk arising from variation in earnings before interest and tax.

Call Option : If the right is to buy, it is referred as call option.

Call Provision : A stipulation in a bond or preferred stock contract enabling the issuing firm to call back (repurchase) the outstanding bonds or preferred stock at a pre-determined price.

Capital Budget : The list of planned capital expenditures prepared usually annually.

Capital Gains (Losses) : Gains (Losses) arising from the sale of capital assets.

Capital Structure : The composition of a firm's long-term financing consisting of equity, preference capital, and long-term debt.

Cash Budget : A statement showing the forecast of cash receipts, cash disbursements, and net cash balance over a period of time on a roll over basis.

Cash Credit : An arrangement whereby the bank allows the borrower to borrow up to a certain limit, the cash credit limit.

Certainty Equivalent : A certain cash flow which is equal in desirability to an uncertain cash flow.

Collateral : Asset which serves as security for a loan.

Collection Float : The amount of cheques deposited by the firm in the bank but not cleared.

Compensating Balance : A balance of a given amount that the firm maintains in its demand deposit account. It may be required by either a formal or informal agreement with the firm's commercial bank. Such balances are usually required by the bank (1) on the unused portion of a loan commitment, (2) on the unpaid portion of an outstanding loan, or (3) in exchange for certain services provided by the bank, such as check clearing or credit information. These balances raise the effective rate of interest paid on borrowed funds.

Compound Interest : Interest payable (receivable) on interest.

Compounding : The process of determining the final value of an amount when compound interest applies.

Comprehensive Budget : Detailed schedules appropriate to each of the key functions in the organization, together with the entire company's plan, summarized in a projected cash flow budget and proforma financial statements.

Concentration Bank : A bank where the firm maintains a major disbursing account.

Conglomerate : A multifaceted corporation involved in a variety of products and services.

Controller : Financial officer responsible for accounting and control.

Cost of Capital : The minimum rate of return the firm must earn on its investments in order to satisfy the expectations of investors who provide the funds to the firm. It is often measured as the weighted arithmetic average of the cost of various sources of finance tapped by the firm.

Cost of Debt : The rate that has to be received from an investment in order to achieve the required rate of return for the creditors.

Cost of Preferred Stock : The rate of return that must be earned on the preferred stockholders' investment to satisfy their required rate of return.

Coupon Rate : The stated interest rate on a bond.

Covenant : A definite provision in a loan contract.

Coverage Ratios : A group of ratios that measure a firm's ability to meet its recurring fixed charge obligations, such as interest on long-term debt, lease payments, and/or preferred stock dividends.

Credit Period : The length of time customers are allowed for their credit purchases.

Current Yield : Annual interest or dividend currently received divided by the current market price.

DCF : Abbreviation for discounted cash flow.

Days Sales Outstanding : The ratio of receivables outstanding to average daily sales.

Debt Capacity : The maximum amount of debt that a firm can raise at a given point of time.

Debt-Asset Ratio : A leverage ratio defined as total debt divided by total assets.

Default Risk : The uncertainty of expected returns from a security attributable to possible changes in the financial capacity of the security issuer to make future payments to the security owner. Treasury securities are considered to be default-free. Default risk is also referred to as "financial risk" in the context of marketable securities management.

Degree of Financial Leverage : The percentage change in earnings per share as a result of one percent change in earnings before interest and tax.

Degree of Operating Leverage : The percentage change in earnings before interest and taxes as a result of one percent change in sales.

Degree of Total Leverage : The percentage change in earnings per share as a result of one percent change in sales.

Depository Receipt : It is a negotiable certificate issued by a depository bank which represents the beneficial interest in shares issued by a company.

Derivative Instruments : Instruments derived from conventional direct dealings in securities, currencies and commodities.

Direct Quotation : The exchange rate expressed as the price per unit of foreign currency in terms of home or local currency equal to one unit of foreign currency.

Discounting : The process of finding the present value of a future cash flow or a series of future cash flows.

Diversification : Investment in more than one risky asset with the objective of risk reduction.

Economic Order Quantity (EOQ) : The quantity of goods ordered which minimizes the sum of inventory ordering cost and inventory carrying cost.

Exchange Rate : The rate at which one currency is converted into another currency.

Expected Return : The arithmetic mean or average of all possible outcomes where those outcomes are weighted by the probability that each will occur.

Export Credit Guarantee Corporation (ECGC) : A Government of India undertaking which provides insurance to Indian exporters of goods and services.

External Funds : Funds acquired from external sources by borrowing or issuing additional equity or preference stock.

Factoring of Accounts Receivable : The outright sale of a firm's accounts receivable to another party (the factor) with or without recourse. The factor, in turn, bears the risk of collection.

Financial Institutions : Institutions engaged in financial activities. Examples: insurance companies, commercial banks, leasing companies.

Financial Intermediaries : Financial institutions which borrow money from some and lend it to others.

Financial Lease : A non-cancellable contractual commitment on the part of the firm leasing the asset (the lessee) to make a series of payments to the firm that actually owns the asset (the lessor) for the use of the asset.

Financial Leverage : This refers to the employment of debt capital entailing fixed financial burden.

Financial Risk : The risk which arises from the use of debt capital.

Financial Structure : The pattern of total financing employed by a firm.

Fixed Budget : A plan of operations drawn up for only one level of estimated annual volume.

Flexible Budget : A budget statement showing how costs vary with changes in the activity level.

Flexible Budgeting : A method of planning operations, for purposes of cost control, which permits allowed costs to be adjusted to the attained level of volume.

Flexible Budgeting Formula : An expression of the composition of a mixed cost element as a variable rate and a fixed cost amount. The budget allowance for an expense equals the fixed cost plus the unit variable cost multiplied by the number of units.

Float	:	Funds represented by checks which have been issued but which have not been collected.
Floatation Costs	:	The legal, printing, postage, underwriting brokerage, and other costs of issuing securities.
Floating Lien	:	A general lien against a company's assets.
Forecast Volume	:	The level of activity (production, sales, or other activity) anticipated by management for the coming fiscal period and around which the fixed budget is constructed.
Foreign Exchange	:	The mechanism by which one currency is converted into other is referred foreign exchange.
Futures	:	A futures contract is a form of forward contract which conveys an agreement to buy or sell a specific amount of a commodity or financial instrument at a particular price on a stipulated future date.
GDR	:	A GDR is a negotiable instrument which represents publicly traded local-currency-equity share.
Hedgers	:	The parties who perform hedging is hedgers.
Hedging	:	It is an act, in which an investor seeks to protect a position or anticipated position in spot market by using an opposite position in derivatives.
Horizontal Merger	:	A merger between one or more firms engaged in the same line of activity.
Hurdle Rate	:	In investment decision-making, the minimum acceptable rate of return on a project.
Industrial Credit and Investment Corporation of India (ICICI)	:	An All-India term lending financial institution which seeks to provide assistance to units in private sector, particularly to meet their foreign exchange requirements.
Industrial Reconstruction Bank of India (IRBI)	:	A central agency to help in the reconstruction and rehabilitation of industrial units which have closed down or which face the risk of closure.
Incremental Cash Flows	:	The cash flows that result from the acceptance of a capital budgeting project.
Indenture	:	A formal agreement between the issuer and purchasers of a bond.
Indirect Quotation	:	The unit of home currency is kept constant and the exchange rate is expressed as so many units of foreign currency.
Industrial Development Bank of India (IDBI)	:	An apex term lending financial institution in India.
Industrial Finance Corporation of India (IFCI)	:	An All-India term lending financial institution which seeks to primarily provide medium and long-term credit to industry.
Industrial Policy Resolution	:	A central resolution which provides the framework for governmental regulations, restrictions, and incentives.
Inflation Premium	:	A premium for anticipated inflation that investors require in addition to the pure rate of interest.
Internal Rate of Return	:	The rate of discount at which the net present value of an investment is zero.
Intrinsic Value	:	The intrinsic value of an asset is the present value of the stream of benefits expected from it. It is also referred to as the fair value or reasonable value or investment value.
Inventory Turnover	:	The ratio of net sales to inventory.
Investment Banker	:	A financial specialist who underwrites and distributes new securities and advises corporate clients about raising new funds.

Investment Center : A segment of a company whose manager has control over the amount of investment in the center as well as over revenues and costs

Investment Opportunity Schedule : A listing or graphical representation of a firm's investment opportunities arranged in the order of projects' internal rate of return.

Issue House : An agency which performs a variety of functions relating to security issue.

Letter of Credit : A letter from a bank mentioning that it has established a line of credit in favor of a certain party.

Leverage : In financial analysis, leverage represents the influence of one financial variable over some other related financial variable.

Leveraged Leasing : A leasing arrangement in which the lessor will generally supply equity funds of 20 to 30 percent of the purchase price and borrow the remainder from a third-party lender.

Line of Credit : An agreement under which a financial institution agrees to provide credit up to a specified limit during a given period.

Majority Rule Voting : A system of voting under which a group which holds a majority of shares has the power of electing the entire board of directors.

Marginal Cost of Capital : The cost of capital that represents the weighted cost of each additional rupee of financing from all sources, debt, preferred stock, and common stock.

Market-Value Weights : The percentage of financing provided by different capital sources, measured by the current market prices of the firm's bonds and preferred and common stock.

Master Budget : A budget covering all aspects of a firm's working. It is also referred to as the comprehensive budget.

Maturity Date : The date upon which a borrower is to repay a loan.

Merger : A combination of two or more firms into one firm. A merger may involve absorption (acquisition) or consolidation. In an absorption, one firm acquires one or more other firms. In a consolidation, two or more firms combine to form a new entity. We use the term merger and amalgamation interchangeably.

Money Market : The market for short-term funds.

Mutually Exclusive Projects : A set of projects that perform essentially the same task, so that acceptance of one will necessarily mean rejection of the others.

National Small Industries Corporation (NSIC) : A central agency which seeks to aid, counsel, assist, finance, protect, and promote the interest of small industries in the country.

Net Present Value (NPV) : A method for evaluating investment proposals. NPV is defined as present value of benefits minus present value of costs.

Net Profit Margin : Net income/sales. A ratio that measures the net income of the firm as a percent of sales.

Net Working Capital : Net working capital is the difference between Total Current Assets and Total Current Liabilities.

Nominal Interest Rate : Interest rate expressed in money terms.

Note Lending System : Under this arrangement, the borrower takes a loan, usually of 90 days duration, against a promissory loan.

Operating Cycle : The operating cycle of a firm begins with the acquisition of raw materials and ends with the collection of receivables.

Operating Lease : A contractual commitment on the part of the firm leasing the asset (the lessee) to make a series of payments to the firm that actually owns the asset (the lessor) for use of the asset. An operating lease differs from a financial lease in that it can be cancelled by the lessee at short notice without any significant penalty.

Operating Leverage : The responsiveness of the firm's earning before interest and taxes to changes in sales. This responsiveness arises from the firm's level of fixed operating costs.

Optimal Capital Structure : The capital structure that minimizes the firm's composite cost of capital (maximizes the common stock price) for raising a given amount of funds.

Options : Option is a contract that confers the right, but not an obligation to the holder to buy or sell an underlying assets like stock, currency, commodity, financial instrument or a futures contract at a price agreed on a specific date or by a specific expiry date.

Overdraft System : Under this arrangement the borrower is allowed to overdraw on his current account with the banker up to a certain specified limit during a given period.

Payback Period : The length of time required for an asset to generate cash flows just enough to cover the initial outlay.

Payment Float : The amount of cheques issued by the firm but not paid for by the bank.

Payout Ratio : The proportion of earnings paid out by way of dividends.

Permanent Investment : An investment that the firm expects to hold longer than one year. The firm makes permanent investments in fixed and current assets. Contrast with temporary investments.

Perpetuity : An investment providing a constant, annual (periodic) return perpetually.

Physical Budgets : Budgets for unit sales, personnel or manpower, unit production, inventories, and physical facilities. These budgets are used as the basis for generating cost and profit budgets.

Planning Budget : The detailed plan of operations based on one level of forecast volume.

Portfolio : A combination of assets.

Portfolio Effect : The extent to which the variability of the returns on a portfolio is less than the sum of the variability of the individual assets in the portfolio.

Portfolio Theory : A theory concerned with the delineation of efficient portfolios and selection of optimal portfolios.

Post Audit : A comparison of the actual results and expected results of an investment project.

Present Value : It is the value of a future stream of payments or receipts discounted at a given rate to the present time.

Price/Earnings (P/E) Ratio : The ratio of market price per share to earnings per share. This ratio shows what investors are willing to pay per rupee of earnings.

Primary Market : The market in which financial securities are issued.

Private Company : A corporate entity which (i) limits the number of its members to 50, (ii) does not invite public to subscribe to its capital, and (iii) restricts the members' right to transfer shares.

Processing Float : Funds tied up during the time required for the firm to process remittance checks before they can be deposited in the bank.

Profitability Index : Also called benefit-cost ratio, it measures the present value per rupee of outlay and is useful for ranking projects in the order of decreasingly efficient use of capital.

Proprietorship : A business firm owned by a single individual.

Proxy : The authorization given by one person to another to vote on his behalf in the stockholders' meeting.

Public Deposit : Unsecured deposit obtained by a company from public at large.

Public Investment Board (PIB) : A body which appraises and recommends projects falling under the purview of the central government.

Put Option : If the right is to sell, it is referred as put option.

Quick Ratio : See acid-test ratio.

Receivables Turnover Ratio : The ratio of net sales to receivables.

Reinvestment Rate : The rate of return at which the intermediate cash inflows of a project may be reinvested.

Reorganization : An adjustment in the financial structure of a firm, which is financially distressed, in order to enhance its viability.

Required Rate of Return : Rate of return required by investors on their investment.

Reserve Bank of India (RBI) : The central banking authority of India.

Restrictive Covenants : Provisions in the loan agreement that place restrictions on the borrower and make the loan immediately payable and due when violated. These restrictive covenants are designed to maintain the borrower's financial condition on a par with that which existed the time the loan was made.

Risk : Risk refers to variability. It is measured in financial analysis generally by standard deviation or by beta coefficient.

Risk Adjusted Discount Rate : The discount rate applicable to a risky investment. It is equal to the risk-free rate of return plus a risk premium reflecting the risk characterizing the investment.

Risk Aversion : A dislike for risk. Generally investors are risk averse. Their required rate of return varies with the level of risk – the higher the level of risk, the higher the required rate of return.

Risk Premium : The additional return expected for assuming risk.

Riskless Rate of Return : The rate of return on risk-free investments, such as the interest rate on short-term government securities.

SIDCs : State level development institutions which seek to serve as catalytic agents in the industrialization process.

Safety Stock : Inventories carried to protect against variations in sales rate, production rate and procurement time.

Sale and Leaseback Arrangement : An arrangement arising when a firm sells land, buildings, or equipment that it already owns and simultaneously enters into an agreement to lease the property back for a specified period, under specific terms.

Sales Mix : The composition of the total sales of a multiproduct firm in terms of the relative sales of each product line.

Salvage Value : The value realized from the disposal of an asset.

Secondary Market : The market for outstanding securities.

Sensitivity Analysis : A technique of risk analysis which studies the responsiveness of a criterion of merit like net present value or internal rate of return to variations in underlying factors like selling price, quantity sold, etc.

Simulation : A technique of risk analysis which seeks to develop the simulated probability distribution of a criterion of merit like net present value or internal rate of return on the basis of the relationship between the underlying factors like quantity, selling price, project life, etc. and the criterion of merit.

Sole Proprietorship : A business owned by a single individual.

Speculators : They are basically traders, who enter the futures or options contract, with a view of making profit from the subsequent price movements.

Spontaneous Financing : The trade credit and other accounts payable that arise spontaneously in the firm's day-to-day operations.

Spot Rate : Exchange rate which applies to 'on the spot' delivery of the currency – in practice it means delivery two days after the day of trade.

State Financial Corporation (SFCs) : State-level financial institutions catering mainly to the needs of the small and medium scale sector.

Stock Exchanges : Formal organizations involved in the trading of securities. Such exchanges are tangible entities that conduct auction markets in listed securities.

Subscription Price : Price at which the issue of a security can be subscribed to by the investors.

Synergy : Gain from combining two or more units. In a synergistic merger the earnings of the combined entity are expected to exceed the sum of the earnings of the combining entities.

Systematic Risk : Risk that cannot be diversified away. It is also referred to as market risk or non-diversifiable risk.

Technical Insolvency : Situation in which the firm can no longer honor its financial obligations. Although its assets may exceed its total liabilities, thereby indicating a positive net worth, the company simply does not have sufficient liquidity to pay its debts.

Temporary Investments : These investments are comprised of the firm's investment in current assets that will be liquidated and not replaced within a period of one year or less. Examples include seasonal expansions in inventories and accounts receivables.

Term Loan : A loan which is generally repayable in more than one year and less than ten years.

Term Structure of Interest Rates : The relationship between interest rates and the term to maturity, where the risk of default is held constant.

Trade Credit : Inter-firm credit arising from credit sales. It is recorded as an account receivable by the seller and as an account payable by the buyer.

Transit Float : Funds tied up during the time necessary for a deposited check to clear through the commercial banking system and become usable funds to the company.

Treasurer : Financial officer concerned mainly with the task of financing and activities related thereto.

Unit Trust of India (UTI)	:	An investment company, UTI aims at mobilizing the savings of the public and channelizes them into productive corporate investments.
Unlisted Security	:	Security which is not listed on a recognized stock exchange.
Unsystematic Risk	:	Risk that can be diversified away. It is also referred to as unique risk, specific risk, residual risk, or diversifiable risk.
Value Date Concept	:	The day on which the delivery of agreed good/currency takes place is referred to as 'Value date'.
Venture Capitalists	:	Investors interested in supplying capital to particularly high-risk situations, such as start-ups or firms denied conventional financing.
Vertical Merger	:	A merger between a supplier and its customer.
Warrant	:	Is a call option to buy a stated number of shares.
Warrant Price	:	The exercise price of a warrant is what the holder must pay to purchase the stated number of shares.
Working Capital	:	There are two measures of working capital – Gross working capital and Net working capital. Gross working capital is the total of current assets. Net working capital is the difference between the total of current assets and the total of current liabilities.
Zero Base Budgeting	:	Budgeting in which figures are developed from scratch every year.