
UNIT 1 NATURE OF LONG TERM FINANCIAL DECISIONS

Objectives

The objectives of this unit are to :

- explain the basics of financial decisions and spell out the distinguishing features and interlinkages between financing and investment decisions of the firm.
- describe and illustrate the primary objectives of financial decision making.
- discuss the cardinal principles of financial decisions.
- explain and illustrate the concepts of time value of money.
- explain and illustrate the computation of the implied rate of interest, implied principal amount and annuities in borrowing and lending transactions.
- narrates the basic factors influencing long term financial decisions.

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1.1 INTRODUCTION

Role and responsibilities of a finance manager have undergone a remarkable transformation during the last four decades. Unlike the past, finance manager plays pivotal role in planning the quantum and pattern of fund requirements, procuring the desired amount of funds on reasonable terms, allocating funds so pooled among profitable outlets and controlling the uses of funds. Since all business activities involve planning for and utilization of funds, finance manager must have clear conception of the financial objectives of his firm and cardinal principles of financial decisions. Against this backdrop, we shall discuss the basics of financial decisions; nature of long term financing and investment decisions; NPV Rule; time value of money; determination of implied interest rates, implied principal amount and annuities and basic factors influencing long term financial decisions.

1.2 NATURE OF FINANCIAL DECISIONS

Financial decisions refer to decisions concerning financial matters of a business concern. Decisions regarding magnitude of funds to be invested to enable a firm to accomplish its ultimate goal, kind of assets to be acquired, pattern of capitalization, pattern of distribution of firm's, income and similar other matters are included in financial decisions. A few specific points in this regard are

- (a) Financial decisions are taken by a finance manager alone or in conjunction with his other management colleagues of the enterprise.
- (b) A finance manager is responsible to handle all such problems as involve financial matters.
- (c) The entire gamut of financial decisions can be classified in three broad categories: Investment Decisions, Financial Decisions and Dividend Policy Decisions.

1.2.1 Investment Decisions

Investment decisions, the most important financial decision, is concerned with determining the total amount of assets to be held in the firm, the make-up of these assets and the business risk complexion of the firm as perceived by the investors. The salient features of investment decisions are as follows:

- (i) The investment decision are of two types, viz, long term investment decisions and short term investment decisions.
- (ii) Long term investment decision decides about the allocation of capital to investment projects whose benefits accrue in the long run. It is concerned with deciding :
 - What capital expenditure should the firm make?
 - What volume of funds should be committed?
 - How should funds be allocated as among different investment opportunities?
- (iii) Short terms investment decision decides about allocation of funds as among cash and equivalents, receivables and inventories.
- (iv) A firm may have a number of profitable investment proposals in hand. But owing to paucity of funds, finance manager should be meticulous in choosing the most profitable one.
- (v) Thrust of financial decisions is on building suitable asset mix.

1.2.2 Financing Decision

In Financing decision, finance manager has to decide about the optimal

financing mix. It is concerned with how to raise money for business so as to maximize value of the firm. Highlights of financing decisions are as follows:

- (i) Question of making financing decision arise as soon as decision regarding investment outlets is made. At times investment decision follows financing decision.
- (ii) A finance manager has to decide the appropriate mix of debt and equity in such a way that wealth of the shareholders is maximized.
- (iii) A finance manager is supposed to delve into the following issues requiring financing decisions:
 - (a) From which sources are funds available?
 - (b) To what extent are funds available from these sources?
 - (c) What is the cost of funds presently used?
 - (d) What is the expected cost of future financing?
 - (e) What instruments should be employed to raise funds and at what time?
 - (f) Should firm approach financial institutions for securing funds?
 - (g) What will be the terms and conditions on which the funds will be raised from different sources?
 - (h) What will be the nature of underwriting arrangements?
 - (i) What innovations can be made in raising funds from wide variety of sources?
- (iv) A finance manager has to be in constant touch with financial markets.
- (v) Financing decisions are primarily concerned with capital structure or debt equity compositions.

1.2.3 Dividend Policy Decision

Dividend policy decision decides about allocation of business earnings between payment to shareholders and retained earnings. A part of the profits is distributed amongst shareholders and other part is retained for growth of the company. A few specific points in this regard are as follows:

- (i) Closely related to the issue of raising finance is the issue of distribution of profits, which is effectively a source of total fund requirements. This constitutes the area of dividend decisions.
- (ii) Although both growth and dividends are desirable, these two goals are conflicting: a higher dividend rate means less retained earnings and consequently, a slower rate of growth in earnings and stock prices.
- (iii) For maximizing the shareholder's wealth, the finance manager has to strike a satisfactory compromise between the two.
- (iv) Prudent finance manager takes dividend decision in the light of investor's preferences, liquidity position of the firm, stability of earnings of the firm, need to repay debt, restrictions in debt contracts, access to capital markets etc.
- (v) Dividend policy decision is integral part of financing decisions.

1.2.4 Inter-relationship Amongst these Decisions

The interrelationship between three types of financial decisions centres around the following issues:

(a) Which decision comes first investment or financing?

One often wonders whether the financing decision comes first or the investment decision. The difficulty with such a question is that any answer in favour of the one or the other is bound to be wrong. For example, why would

any management want to raise any capital unless it had some kind of project already in mind? Alternatively, how can a management consider undertaking a new project unless it already had some ideas as to how it is going to raise the necessary finances? So how does one decide which comes first? Chicken or the egg? The answer in our context is somewhat simpler than the moot question concerning the egg and its parent. The two decisions are in reality simultaneous. In fact neither decision by itself makes sense without the other. There would be no financing decisions to make in the absence of investment decisions and vice versa.

(b) Investment Decision Vs Financing Decision- Fundamental Difference

This, however, is not to imply that the line dividing the two is fuzzy. In fact, conceptually the two kinds of decisions are quite different and it is important to recognize them as such. What is the fundamental difference between the two ? Evidently, both, financing as well as investment decisions involve a certain selection of cash flows. Typically, a financing decision involves accepting cash today (inflows) from the capital market and repaying the same together with interest or dividend subsequently over a period of time (outflows). On the other hand, an investment decision involves investing the cash today in the product market (outflow) and receiving a stream of earnings (inflows) subsequently. Now, the cash invested in the product market is, in fact, the cash which is raised from the capital market.

(c) Relationship through NPV

If after paying all lenders their interest and shareholders their normally expected dividends, some surplus is left, obviously, it will belong to the shareholders thereby increasing their wealth. Usually, however, it is extremely cumbersome, though not impossible, to match the cash flows arising from the financing decisions and the cash flows accruing from the investment decisions on a period basis on account of the possible mismatch between their timings. It is therefore far simpler to capture the financing cash flows through their cost (of capital and to use this rate for discounting the operating cash flows. Under this framework, obtaining a positive net present value (NPV) implies the same thing as minimizing the cost of capital. The point becomes further clear if we take another look at the NPV formula i.e.

$$NPV=C_0+C_1/(1+r)$$

where C_0 and C_1 are cash flows occurring at time 0 and 1

A close look into the formula would readily show that ‘r’ and NPV are inversely related. A higher ‘r’ would mean lower NPV and vice versa. The ‘r’ being the rate of discount which normally represents cost of capital. It clearly highlights the interlinkage between the financing and the investment decisions and provides an explicit justification of the NPV rule as the basic rule of financial decision making.

Activity 1

- (a) Identify forces than brought about fundamental change in role and responsibilities of a finance manager in India.

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- (b) Write down two sets of cash flows; one representing a financing scheme and the other an investment scheme.

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(c) Show the IRR of the Financing Scheme.

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(d) Discount the cash flows of the investment scheme using the above IRR as the discount rate.

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(e) 'NPV formula captures the interlinkages between investment and financing decision'. Explain, with examples.

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1.3 WEALTH MAXIMISATION AND MAXIMISATION OF PROFIT POOL OBJECTIVES

In a highly competitive environment, financial objective of a firm should be set within the framework of corporate objective of sustainable competitive edge. As such Wealth maximization objective has come to be widely recognized criterion with which the performance of a business enterprise is evaluated. The word wealth refers to the net present worth of the firm. Net present worth is the difference between gross present worth and the amount of capital investment required to achieve the benefits. Gross present worth represents the present value of expected cash flows discounted at a rate which reflects their certainty or uncertainty. Thus, wealth maximization objective (WMO) as decisional criterion suggests that any financial action giving positive NPV should be accepted. Algebraically, net present value can be expressed as follows:

$$\text{NPV (W)} = \frac{A_1}{(1+k)} + \frac{A_2}{(1+k)^2} + \frac{A_n}{(1+k)^n} - C$$

where

W = net present worth

A₁, A₂... A_n = the stream of benefits expected to occur over a period of time

K = appropriate discount rate to measure risk

C = initial outlay required to acquire the asset

n = time

The objective of wealth maximization removes the following limitations of profit maximization objective (all such actions increasing income and cutting down costs should be undertaken):

- (i) The term profit as used in the profit maximization goal is vague.
- (ii) it ignores time value factor.
- (iii) It ignores risk factor.

The wealth maximization objective has the advantage of exactness and unambiguity and also takes care of time value and risk factors.

1.3.1 Value Maximisation is Wealth Maximisation

The owner of the business employs a manager to look after his business interests. In case of a publicly held company, a manager is expected to act in the best interest of the shareholders, who are the owners of the business. Now, what is in the best interest of the shareholders? This depends on what the shareholders want. Assuming the shareholders to be economically rational beings, it appears reasonable to assume that in general they want to get as rich as possible through their stake in the business. In other words, they want to maximize their wealth i.e. market value of shareholding. They are assumed to trade their wealth so as to obtain their desired consumption patterns. Further, they are assumed to choose the risks associated with the consumption pattern chosen by them (for example, lending your money may give you a consumption pattern which is less risky, whereas investing, your money in a security or share may give you a consumption pattern with higher risk). In the final analysis, shareholders seek to maximize their return for a given level of risk or minimize their risk for a given level of return.

1.3.2 Objective of Maximization of Profit Pool:

In his endeavour to foster overall objective of sustainable competitive edge over the rivals, finance manager has to focus on value maximization-not only maximization of shareholders' value but also stakeholders' value. Additional value accrues only with efforts that maximize profit pool. A profit pool can be defined as the total profits earned in an industry at all points along the industry's value chain. It includes disaggregation of processes, mapping of the value chain beyond the confines of legal entities, adoption of flexible organizational structures and creation of net-worked organisations. Main highlights of this objective are:

- (i) Profit pool concept is based on the concept of looking beyond the core business.
- (ii) Shape of a profit pool reflects the competitive dynamics of a business.
- (iii) Profit concentrations emanate from actions and interactions of companies and customers.
- (iv) A profit pool is not stagnant.
- (v) A profit pool map answers the most pertinent question where and how is money being made.
- (vi) Profit pool may prompts the management to examine how same profit sources exert influence over others and shape competition.

1.3.3 Other Objectives and Value Maximisation Objective

There are many other objectives which are assumed to compete with Value Maximisation Objective (VMO). In fact there are a whole lot of researchers who interview practicing managers and 'show' that the managers often have a whole lot of other 'legitimate' objectives other than the VMO. These are often enumerated as maximizing return on investment, maximizing profit after taxes, maximizing sales, maximizing the market share of their products and so on. It is often held that very few managers in fact agree to pursue value maximisation of their firms as an explicit objective.

A little reflection reveals the intrinsic weakness of such studies. For example, one researcher asked a manager who held maximization of market share as the corporate objective, as to whether he would like his company to capture 100% market share by pricing below costs. Clearly if market share maximization is the prime objective, he should have no objection to such a proposition. And yet it would be a poor manager indeed who goes for such an opinion. Clearly, his desire to maximize market share even at cost of profits in the short terms, must have been triggered off by the possibility of attaining a monopolistic position so that profits in the long term can be maximized. Similarly, a manager who maximizes sales may be operating under the assumption, that such a course of action would eventually lead to enhanced profits in the long run, if not immediately. Other objectives such as maximization of return on investment or profit before taxes etc. are at any rate linked to the wealth maximization criteria directly or indirectly. We can see that what are constructed as objective as other than VMO are in fact merely short term operational strategies for maximizing wealth of the shareholders in the long run.

1.3.4 Net Present Value Rule

Wealth maximization objective gives Net Present Value (NPV) rule as the most basic rule of financial decision making. To make an investment decision, you compare the returns on the investment with what the financial markets are offering. The NPV rule really provides you with a simple way of making that comparison. By computing the present value of an investment you are finding out what the investment is worth today. On comparing the present value of an investment with its initial outlay, you arrive at the net present value which may be positive or negative. The concept of NPV, in the form of a simple algebraic formula, may be stated as follows:

$$NPV = C_1/(1+r) - C_0$$

Where C_0 stands for initial cash outlay, C_1 for the cash that will be received from the investment in one year's time, r for is the discount rate. The discount rate r should include an appropriate premium for risk.

As a rule, an investment is worth making if it has a positive NPV. If an investment's NPV is negative, it should be rejected.

Example:

X invests Rs.70,000 in a piece of land. There are three proposals before him for its sale:

A	Rs.75,000
B	Rs.77,000
C	Rs.80,000

His expectation of income is 10%. When should he sell his piece of land? By applying NPV Rule, the results will be as follows:

$$NPV = C_1/(1+r) - C_0$$

$$NPV_1 = \frac{75,000}{(1+0.1)} - 70,000 = -1817.50$$

$$NPV_2 = \frac{77,000}{(1+0.1)} - 70,000 = 0$$

$$NPV_3 = \frac{80,000}{(1+0.1)} - 70,000 = 2727.27$$

Applying the NPV rule, X will invest in land only where the land will sell for Rs.80,000 next year and not where the land will sell for either Rs.75,000 or Rs.77,000. positive NPV is the logic.

One might ask here: Is this NPV rule valid for firms also? The answer is 'yes', as long as the objective of the firm is value maximization.

1.3.5 VMO and NPV Rule

It clearly emerges from the foregoing discussion that a manager can help the shareholders by making all business decisions in such a manner that the shareholders' stake in the business is maximized. This would essentially mean that the managers would invest in all such investment opportunities where the present value of the expected future cash inflows exceeds the current level of investment, so that this excess of the present value of inflows over the initial investment enhances the total market value of the shares belonging to the shareholders.

It should be clear that if the New Present Value (NPV) of an investment were to be negative, the investors would be better off by investing their funds elsewhere. Thus the manager must invest the shareholders' funds only in ventures which yield positive NPV such that the value of their shares is maximized. Let us suppose that the market value of a firm's share is Rs.100. Let us further assume that the shareholders of the firms expect to earn a return of 20% per annum from their investment in the firm. If the management of the firm fails to earn Rs.20 per share, the market mechanism would ensure that the price of the firm's share drops. How much will the drop be? It depends on the level of the firm's earnings. If the earnings level falls to say Rs.15 per share over a period of time, the price of the share would drop to Rs.75. why? This is because, given the earnings per share of Rs.15 of the firm, the shareholders can continue to earn their expected level of 20% return only if the price of the share fell to Rs.75. this drop in the price of the share would however lower the wealth of the shareholders. Hence, the manager must ensure that the funds are invested in ventures which would be able to generate enough surplus to meet the expectations of the shareholders. thus, the principal objective in business becomes the maximization of the shareholders wealth.

Activity 2

(a) Map out profit pool for a transport industry.

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(b) The market price of a company's share falls. What could be the possible reasons?

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(c) Investors in a capital market revise their expectation of return from a particular company from 20% to 24% on account of that company having undertaken some risky ventures recently. Would the market price of that company's share go up or go down ? why?

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- (d) On account of certain government concessions to a particular company, its financial performance is expected to improve in the future. Would the market price of the company's share go up or go down? Why?

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- (e) A firm has decided to set up a steel plant. What sources of funds would you suggest to the firm for funding the plant?

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1.4 CARDINAL PRINCIPLES OF FINANCIAL DECISIONS:

A finance manager in his attempt to maximize corporate value of the firm must keep in view the following basic considerations while making financial decisions:

(i) Strategic Principle:

According to this principle, financial decisions of a firm should be tethered to the overall corporate objectives and strategies.

(ii) Optimization Principle:

Thrust of financial decisions should be on intensive use of available funds and for that purpose, proper balance between fixed and working capital should be sought.

(iii) Risk – Return Principle

Maintaining suitable balance between risk and return is the crux of financial decision making. Given the product-market strategy, return and risk are the function of decision relating to size of the firm, kinds of assets to be acquired, types of funds to be employed, extent of funds to be kept in liquid form, etc.

(iv) Marginal Principle:

According to this principle, a firm should continue to operate upto the point where its marginal revenue is just equal to its marginal cost.

(v) Suitability Principle:

Focus of this principle is on creating an asset by a financial instrument of the same approximate maturity.

(vi) Flexibility Principle:

According to this principle, financial plan of a firm should be capable to being changed in sync with changing environment.

(vii) Timing Principle:

Timing should be crucial consideration in financial decisions. Investment and financing decisions should be taken at a time that enable the organisation to seize market opportunities and minimize cost of raising funds.

1.5 TIME VALUE OF MONEY

Suppose you are given an option to receive Rs.100 today or Rs.100 a year from today, which option would you choose? Of course, Rs.100 today. Why? Could it be that Rs.100 today represents greater certainty than Rs.100 a year from now? Possibly. But this element of risk associated with Rs.100 a year from now could be eliminated or largely reduced through suitable promises, insurance against default and so on, so that you may disregard the possibility of such default. So you are required to make your choice once again. Would you still choose to receive Rs.100 today rather than a year from now? Why? May be you are afraid that Rs.100 a year from now might be worth much less than Rs.100 today on account of inflation. Let us suppose, for the sake of argument, that you are living in an economy which is free from inflation. You may be promised Rs.100 worth of goods today, instead of cash and the same amount of goods a year from now, so that you are effectively protected against inflation. What would your choice be? Still Rs.100 today why? A good reason can be that you could collect your Rs.100 today, put it in the fixed deposit in the bank for a year, and collect Rs.110 a year from now, assuming that the bank gives you 10% interest on your deposit. Thus you would be better off by Rs.10 than you would have been if you had received Rs.100 a year later.

The next question could be, why should the bank give you 10% interest on your deposit? The obvious reason is that cash is a scarce resource and the bank is, therefore, prepared to give you a rental (Rs.10) in return for your allowing them the use of your capital (Rs.100) for a year. Needless to say, the bank would not have agreed to give you Rs.10 for using your capital for a year, if it did not expect to earn more than Rs.10 by investing Rs.100 elsewhere during the year. Thus in this case, Rs.10 represents the time value of Rs.100 for a period of one year, i.e. 10% per annum. Of course, the real time value of money would depend on the total amount of money available in the economy and the investment opportunities available in the economy and so on.

Time value of money or time preference for money is one of the central ideas in finance. Money has a time value because of the following reasons:

- (i) Individuals generally prefer current consumption.
- (ii) An investor can profitably employ a rupee received today to give him a higher value to be received tomorrow.
- (iii) Future is uncertain.
- (iv) Inflationary pressures make the money received in future of lesser purchasing power.

Thus, there is preference of having money at present than at a future point of time. This automatically means:

- (i) That a person will have to pay in future more for a rupee received today.
- (ii) A person may prefer to accept less today for a rupee to be received in future.

They are called as compounded value and discounted value.

1.5.1 Compounded Value

The process of finding the future value of a payment or receipt or series of payments or receipts when applying the concept of compound interest is known as compounding. It is also called terminal value.

Present Cash to Future Cash

Let us now understand the concept of terminal value. Given that the time value of money (say interest rate) is 10% per annum, what will be the value of Rs.100 one year from today? Obviously Rs.110. Thus the terminal (or compounded) value of Rs.100 at the rate of 10% a year from now is equal to Rs.110.

How did you arrive at the terminal value of Rs.110? whether you were aware of it or not, you multiplied Rs.100 by 1.10 (being 10%) and added the result to Rs.100, to obtain Rs.110.

In mathematical terms:

Terminal value of Rs.100 @ 10% at the end of one year is equal to $100 + 0.10 \times 100 = 100 \times 1.1 = \text{Rs.}110$.

Similarly, can you now find out the terminal value of Rs.100 at the rate of 10% two years from today?

(Hint : First find out the terminal value of Rs.100 one year from now, which will be Rs.110. now find out the terminal value of Rs.110 a further one year hence.)

In mathematical terms, this would be equal to $100 \times 1.1 \times 1.1 = 100 \times 1.1^2 = \text{Rs.}121$

In general then, the terminal value of an amount 'p', at a rate of 'r' per period, and for 'n' periods from today will be

$$p (1+r) (1+r) (1+r) \dots n \text{ times} = p (1+r)^n$$

Note: $(1+r)^n$ is known as the Terminal Value factor n periods hence, at the compound rate of r per period.

In case of multiple period compounding

$$A = P \left(1 + \frac{r}{m} \right)^{m \times n}$$

Where

- A = Amount after n period
- m = number of times per year compounding is made
- P = Amount in the beginning of period
- r = Interest rate
- n = Number of years for which compounding is to be done

1.5.2 Discounted Value

“Deposit Rs.100 and take back Rs.110 after one year” stated in a numerical way means that Rs.100 is the present value of Rs.110 to be received a year hence. In case of discounted value, we estimate the present worth of a future payment/instalment or series of payments adjusted for the time value of money.

Future Cash to Present Cash

At the rate of 10% per annum, what will be the present (or discounted) value of Rs.110 to be received one year from now? Clearly, this will be Rs.100. how was this arrived at?

By dividing Rs.110 by 1.1 (Remember: Rs.110 was the terminal value of Rs.100 one year hence @ 10%).

Similarly, what will be the present value of Rs.100 to be received one year hence, @ 10% per annum? This will be Rs.90.90909, arrived at by dividing Rs.100 by 1.1.

In mathematical terms:

Present value of Rs.100 to be received one year hence, @ 10% per annum = $100/1.1=90.90909$.

Similarly, the present value of rs. 100 to be received two years. Hence, @ 10% per annum = $(100/1.1)/1.1=100(1.1)^{-2}=82.64463$.

In general then the present value of an amount 'P' to be received in 'n' periods hence, at the rate or 'r' per period will be $=P/(1+r)^n$.

Note: $1/(1+r)^n$ is shown as the present value factor for an amount received 'n' periods hence, at the discount rate of 'r' per period.

Activity 3

- (a) A sum of Rs.1,000 is placed in the savings account of a bank at 5 percent interest rate. Find the sum at the end of two years.

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- (b) An investor has an Opportunity of receiving Rs.1,000, Rs.1,500, Rs.800, Rs.1,100 and Rs.400 respectively at the end of one through five year. Find the present value of this stream of uneven cash flows, if the investor's interest rate is 8 percent?

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- (c) You can get an annual rate of interest of 13 percent on a public deposit with a company. What is the effective rate of interest if the compound is done (a) half yearly (b) quarterly and (c) weekly.

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1.6 DETERMINATION OF IMPLIED INTEREST RATES, IMPLIED PRINCIPAL AMOUNT AND ANNUITIES

In this subsection, the process of determination of implied interest rates, implied principal amount and annuities is explained.

1.6.1 Determination of Implied Interest Rates

Suppose you borrow Rs.100 for one year and the lender asks you to repay Rs.120 one year later. What is the interest rate implied by your borrowing? Clearly 20%. This is because at the end of one year, you are required to repay the principal of Rs.100 as well as the interest of Rs.20.

However, suppose the lender offers you any one of the following repayment schedules for having borrowed Rs.100 now:

Repayment Schedule	1	2	3	4	5	6	7
Repay at the end of 1 st year = Rs.	20	20	45	70	95	95	20
Repay at the end of 2 nd year = Rs.	20	20	90	60	30	5	20
Repay at the end of 3 rd year = Rs.	120	20	—	—	—	5	20
Repay at the end of 4 th year = Rs.	—	120	—	—	—	5	20
Repay at the end of 5 th year = Rs.	—	—	—	—	—	30	20
Repay at the end of 6 th year = Rs.	—	—	—	—	—	—	20
							(Repay in perpetuity) 20

What is the interest rate implied in each of the above repayment schedules? Is it 20% for all the schedules? At this stage you may find it more difficult to provide an answer. It may, however, be relatively simpler to answer the question for schedules 1,2 and 7 intuitively.

In case of schedule 1, Rs.20 is paid towards interest at the end of first year since the loan is fully outstanding. Similarly Rs.20 is paid again at the end of second and third years, at which time the principal of Rs.100 is also repaid. Similarly, in case of schedule 2, the principal amount is fully repaid only at the end of fourth year, till which time the interest of Rs.20 is being paid at the end of every year. In case of schedule 7, the principal is never repaid and hence the interest of Rs.20 is being paid at the end of every year for ever, thus, in all these cases the implied interest rate remains 20% per annum.

For repayment schedules from 3 through 6, a similar interpretation is possible, through this would be somewhat more difficult. Consider, for example, schedule 4. In this case, at the end of first year half of the principal is repaid. However since the entire principal is outstanding for the whole of first year, the interest accrued is Rs.20. This together with half the principal being repaid at the end of the first year amounts to Rs.70. Thus, only Rs.50 is outstanding as long for the second year so that the interest accrued on this amount at the rate of 20% in the second year is only Rs.10. The outstanding loan of Rs.50 is fully paid the end of second year so that the total repayment at the end of second year is Rs.60. Thus, the interest rate implied in this case is also 20%.

(Can you provide similar interpretations for schedules 3,5 and 6? You should be able to see that in all these cases the implied interest rate is 20% per annum).

It should be readily apparent that one may arrive at an infinite number of such repayment schedules all of which imply an interest rate of 20% per annum. In the absence of prior information on the interest rate, how can one determine

what interest rate is implied in a given loan scheme? One must have a more structured and systematic approach to determine the implied interest rate, given a loan amount and its repayment schedule.

Let us consider schedule 3. The Schedule represents a repayment of Rs.45 at the end of first year and Rs.90 at the end of second year, against a loan of Rs.100 now. The interest rate may be defined as that rate at which the present value of the repaid amounts exactly equal Rs.100 Let this rate be equal to 'r'. Thus we must have:

$$100 = 45/(1 + r) + 90/(1 + r)^2$$

(Note : $45/(1 + r)$ represents the present value of Rs.45 to be paid one year later and $90/(1 + r)$ represents the present value of Rs.90 to be paid two years later, at the rate of 'r' per annum).

The value of 'r' can be determined from the above equation using the hit and trial method without much difficulty. In this case, it can be found that when $r = 0.20$, the equation is exactly satisfied, so that the interest rate implied in this case is confirmed to be 20%.

You have studied that Internal Rate of Return (IRR) is the rate at which the present value of the inflows exactly equals the initial outflow. In the above example, the initial borrowing (inflow) is 100 and the repayments (outflows) at the end of the first and second years are Rs.45 and Rs.90, respectively. At the rate of 20%, the present value of outflows exactly equals the initial inflow. Thus, for the set of cash flows represented by Rs. 100, in time zero, -45 at the end of the first year, and -90 at the end of second year respectively (plus sign is for the inflow and minus sign is for the outflow), the implied rate of interest is equal to 20%. In other words, interest rate implied in a typical loan scheme which involves an initial inflow (borrowing) followed by subsequent outflows (repayments) is just like the IRR of the cash flows associated with the loan scheme.

1.6.2 Determination of the Implied Principal Amount

Let us assume that a prospective borrower approaches you for a loan. He is confident of being able to pay you Rs.193 for four years starting a year from today. Assuming that your desired rate of interest is 20% per annum, how much amount would you be prepared to lend him today?

In the light of our discussion above, it should be clear that the amount you should lend, should exactly equal the present value of the annual stream of Rs.193 for four years discounted at the rate of 20%. Let us assume that the amount you would be prepared to lend is P.

Mathematically, we must have:

$$P = 193/(1.2) + 193/(1.2)^2 + 193/(1.2)^3 + 193/(1.2)^4 = 500$$

Thus, you should be prepared to lend Rs.500 in the above case. The same logic may be employed to determine what is called 'fair price of a share' in the market. Let us suppose you expect a company to pay you dividends worth Rs.20, 30 and 40 at the end of one, two and three years from today, respectively. Further suppose you wish to hold the share for only three years and you expect to be able to sell the share at the end of the third year for Rs.120 how much would you be prepared to pay for the share of such a company today? "Clearly, we must employ the same technique as above and

find out the present value of the inflows, namely Rs.20 at the end of first year, Rs.30 at the end of second year and 160 at the end of third year (Rs.40 worth of dividends plus Rs.120 from the sale of the share) at a rate which you expect to earn on your investment". Let us assume that you wish to earn 25% on this investment as you consider the proposition somewhat risky (assuming that higher the risk, higher the return expected). The present value of the above inflows when discounted at 25% yields about Rs.117, which is the amount you should be willing to pay for a single share of the company mentioned above.

1.6.3 Determination of Annuities

Let us assume that you borrow Rs.100 at an interest of 20% per annum for a period of two years. However, you wish to repay the loan in two equal annual installments (also known as annuities). What should be this installment?

(If your answer is Rs.50, it is obviously wrong. Guess why?).

Let us assume that each installment amount equals X. We have a cash flow pattern of the kind + 100 in time zero, X at the end of first year and x at the end of second year respectively.

According to the IRR rule, we must have:

$$100 = X/(1.2) + X/(1.2)^2, \text{ or } 100 = 0.833 X + 0.694 X \text{ or } X = 100/1.527 = 65.49.$$

Activity 4

- (a) In the above example, the repayments commenced one year later. What would you do if annual repayments were to commence as soon as loan was received, i.e. from time zero onwards, instead of from the end of first year onwards?

.....

- (b) In the annuity example given above, can you find out the annuity payments if the repayment period were three years or four years or five years? What will be the annuities, if the payments were to commence immediately?

.....

- (c) Given the cash flows + 500, -100, -200, -300, -400 in period 0,1,2,3 and 4, respectively. Calculate the Implied rate of interest.

.....

1.7 BASIC FACTORS INFLUENCING LONG TERM FINANCIAL DECISIONS

A finance manager has to exercise great skill and prudence while taking long-term financial decisions since they effect the financial health of the enterprise over a long period of time. It would, therefore, be in fitness of things to take the decisions in the light of external and internal factors as discussed below.

External factors

External factors refer to environmental factors that bear upon operations of a business enterprise. These factors are beyond the control and influence of management. The following external factors enter into long term financial decision making process:

- (i) State of economy-i.e. phase of trade cycle.
- (ii) Institutional structures of capital markets (Developed or undeveloped).
- (iii) State regulations in financing (Debt Equity Norms, Dividend Payment Restrictions etc.
- (iv) Taxation policy.
- (v) Expectations of Investors in terms of safety, liquidity and profitability.
- (vi) Lending policies of financial institutions.

Internal Factors

Internal factors comprise those factors which are related with internal conditions of the firm, as listed below:

- (i) Nature of business
- (ii) Size of Business
- (iii) Age of the firm
- (iv) Ownership structure
- (v) Asset structure of the firm
- (vi) Liquidity position of the firm
- (vii) Expected return, cost and risk
- (viii) Probabilities of regular and steady earnings
- (ix) Attitude of management

It is practically inexpedient to consider all the factors at a time since they are antagonistic to each other. A prudent and skillful manager strives to strike a proper balance among these factors in the light of income, risk, control and flexibility factors.

1.8 SUMMARY

Investment decisions pertains to choice of outlets in which funds are to be deployed so as to maximize value of the firm where as financing decisions concern with funding of the outlets and dividend policy decision shed light on allocation of net earnings between retention and distribution.

The objective of a firm is to maximize the wealth of its shareholders. The wealth of the shareholders is measured through the market value of their shares. The Market value of a firm's share is nothing but the present value of its future earnings, discounted at the rate of return expected by its shareholders. In order to maximize the shareholders' wealth, only those projects which yield a positive NPV are accepted.

A rupee today is not equal to a rupee tomorrow. This is so because the rupee can be put to some productive use during the intervening period and thus made to earn. Like any limited resources, capital does not come free. It has a cost, which is termed as the time value of money. The mechanism by which we equate a rupee today with a rupee tomorrow is by bringing both the rupees on a common date, either today or tomorrow. Reducing them to today's value is called their present value. Similarly, reducing them to tomorrow's value is known as terminal value. The former involves discounting the future rupee to the present at the appropriate cost of money, while the latter involves compounding the rupee today to a future date.

Finance manager has to exercise great skill and prudence to strike a proper balance amongst external and internal factors influencing financial decisions.

1.9 KEY WORDS

Annuity is an equalized stream of cash flows over a period of time.

Capital Market is where financial instruments are bought or sold.

Capital Structure is the composition of a firm's capital in terms of debt and equity.

Cost of Capital is a term used to refer to the weighted average of the cost of debt and equity.

Equity represents the share of an investor in a business.

Internal Rate of Return (IRR) is the rate at which the present value of a stream of cash inflows equals the initial outflow, so that the Net Present Value (NPV) of the set of given cash flows equals zero.

Net Present Value is the difference between the present values of cash inflows and cash outflows, when cash inflows are discounted at a suitable rate.

Present Value is value obtained when future cash flows are discounted to the present at a certain rate.

Terminal Value is the value obtained when current cash flows are compounded to the future at a certain rate.

Time Value of Money refers to the intrinsic value of money on account of its alternate use potential.

Financial Decisions refer to decisions concerning financial matters of a business concern.

Investment Decisions refer to assets mix or utilization of funds.

Financing Decisions refer to capital structure or optimal financing mix.

Dividend Policy Decisions decide about allocation of business earnings.

1.10 SELF-ASSESSMENT QUESTIONS

- 1) Why is Time Value of Money independent of inflation and risk?
Differentiate Present Value and Terminal Value.

- 2) What is Net Present Value? How is the NPV rule related to the wealth maximization objectives of a firm?
- 3) What is IRR ? How does it relate to financing decisions? Can you use it for investment decisions of the accept/reject type?
- 4) What is Investment Decisions? How is it different from financing decisions?
- 5) Bring out the factors influencing long-term financial decisions of the firm ?
- 6) 'Obtaining Positive NPV implies the same thing as minimizing the cost of capital' Explain with examples.
- 7) Project a and B require equal amount of investment. Project a will yield Rs.3,000, 4,000 and 5,000 in the first, second and third years, respectively, project B, however, will yield Rs.5,000, 4,000 and 3,000, respectively in the first, second and third years. Which project is superior? Why
- 8) What will be the monthly time adjusted interest rate which is equivalent to an annual interest rate of 15%?
Hint : if annual rate = R, and equivalent quarterly rate = r, We will have :
 $(1 + R) = (1 + r)^4$.
- 9) A client goes to the bank and borrows Rs.12,000. the Bank Manager requires the client to repay Rs.6,000 at the end of every year for three years. What interest rate was the client charged? What would be the interest rate if the Manager had instead asked the client to repay in five annual installments of Rs.4,000 at the beginning of every year starting from the date of borrowing?
- 10) Mr. X is considering to invest Rs.1 lakh in a project which is expected to result in a net cash flow of Rs.20,000 at the end of each year for 8 years. Mr. X will have to borrow the amount required for investment at the rate of 12% per annum. Should he undertake the project ?
- 11) Suppose Govinda is currently earning Rs.50,000. Next year he will earn Rs.60,000. Govinda is profligate and wants to consume Rs.75,000 this year. The current interest rate is 10%. What will be Govinda's consumption potential by next year if he consumes according to his desires this year?
- 12) Amir is a miser. He currently earns Rs.50,000 and will earn Rs.40,000 next year. He plans to consume only Rs.20,000 this year. The current interest rate is 10%. What will be Amir's consumption potential next year?
- 13) It is estimated that a firm has a pension liability of Rs.1 million to be paid in 24 years. To assess the value of the firm's stock, financial analyst wants to discount this liability back to the present. If the discount rate is 16%, what is the present value of this liability?
- 14) Consider a firm with a contract to sell a capital asset for Rs.70,000. Payment is to be received at the end of 2 years. The asset costs Rs.60,000 to produce. Given that the interest rate is 10%, did the firm make a profit on this item? That is the interest rate at which the firm breaks even?
- 15) You have won the Nagaland State Lottery. Lottery officials offer you the choice of the following alternate payouts:
Alternate 1 : Rs.10,000 1 year from now
Alternate 2 : Rs.20,000 5 years from now
Which should you choose if the discount rate is
 - a) 0% ?
 - b) 10% ?
 - c) 20% ?
- 16) You are considering to make an offer to buy some land for Rs.25,000 Your offer will be to pay Rs.5,000 down and for the seller to carry a contract

for the remaining Rs.20,000. you would like to pay off the contract over six years at an interest of 18 per cent per year. For the first year, you wish to pay interest only each month. For the remaining five years, you are willing to pay off the contract in equal monthly installments. What will be your monthly payment for years 2 through 6 if the seller agrees to your terms?

- 17) Sukhdev wants to save money to meet two objectives. First, he would like to be able to retire twenty years from now and have a retirement income of Rs.30,000 per year for at least ten years. Second he would like to purchase a plot of land five years from now at an estimated cost of Rs.15,000. He can afford to save only Rs.5,000 per year for the first five years. Shkhdev expects to earn 10 per cent per year on average from investments over the next thirty years. What must his minimum annual savings be from years 6 through 20 to meet his objectives?
- 18) Deepak has asked your advice on the following problem. He has a mortgage loan on the family home that was made several years ago when interest rates were lower. The loan has a current balance of Rs.30,000 and will be paid off in twenty years by paying Rs.270 per month. He has discussed paying off the loan ahead of schedule with an officer of the bank holding the mortgage. The bank is willing to accept Rs.27,000 right now to pay it off completely. What advice would you offer to Deepak?
- 19) Which decisions comes first-investment or financing?
- 20) Explain, briefly, the nature and types of financial decisions.

1.11 FURTHER READINGS

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1.12 ANSWERS

Activity 3

- (a) Rs.1102.50

- (b) Rs.3921.60
- (c) 13.42%, 13.65%, 13.86%

Activity 4

- (b) First part –Rs.47.47, Rs.38.63 and Rs.33.44
Second part-Rs.39.56. Rs.32.19 and Rs.27.87
- (c) Approximate -2)
Self assessment Questions/Exercises.
 - 7. Prosecute B
 - 8. 1.17.1.
 - 9 first Part – 23.51. Second Part-20/.
 - 10 No. Negative NpV – Rs.648