

Subjective Questions

| <p>1 PNG's current assets and current liabilities are ₹2,00,00,000 and ₹1,40,00,000 respectively. How much additional funds can it borrow from banks for short term, without reducing the current ratio below 1.33? Ans. 1037593.984 ????</p> <p>Formula : Current ratio = Current assets/current liabilities</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--------|---------|--|--|-------------|------------|-----------|----------|------------|-----------|------|--------------------------|-----------|------------------|---------|-------------|------|------|------|-------|-----------------------------------|-------------------|--------|----------|----------|------------------|-------------------|------------------------|------------|--|--------------|
| <p>2 Distinguish between equity & debt instruments.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">BASIS FOR COMPARISON</th> <th style="padding: 5px;">DEBT</th> <th style="padding: 5px;">EQUITY</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Meaning</td> <td style="padding: 5px;">Funds owed by the company towards another party is known as debt</td> <td style="padding: 5px;">Funds raised by the company by issuing shares is known as equity</td> </tr> <tr> <td style="padding: 5px;">What Is It?</td> <td style="padding: 5px;">Loan funds</td> <td style="padding: 5px;">Own funds</td> </tr> <tr> <td style="padding: 5px;">Reflects</td> <td style="padding: 5px;">Obligation</td> <td style="padding: 5px;">Ownership</td> </tr> <tr> <td style="padding: 5px;">Term</td> <td style="padding: 5px;">Comparatively short term</td> <td style="padding: 5px;">Long term</td> </tr> <tr> <td style="padding: 5px;">Status Of Holder</td> <td style="padding: 5px;">Lenders</td> <td style="padding: 5px;">Proprietors</td> </tr> <tr> <td style="padding: 5px;">Risk</td> <td style="padding: 5px;">Less</td> <td style="padding: 5px;">High</td> </tr> <tr> <td style="padding: 5px;">Types</td> <td style="padding: 5px;">Term loan, debentures, bonds etc.</td> <td style="padding: 5px;">Shares and stocks</td> </tr> <tr> <td style="padding: 5px;">Return</td> <td style="padding: 5px;">Interest</td> <td style="padding: 5px;">Dividend</td> </tr> <tr> <td style="padding: 5px;">Nature Of Return</td> <td style="padding: 5px;">Fixed and regular</td> <td style="padding: 5px;">Variable and irregular</td> </tr> <tr> <td style="padding: 5px;">Collateral</td> <td style="padding: 5px;">Essential to secure loans but funds can be raised otherwise also</td> <td style="padding: 5px;">Not required</td> </tr> </tbody> </table> | BASIS FOR COMPARISON | DEBT | EQUITY | Meaning | Funds owed by the company towards another party is known as debt | Funds raised by the company by issuing shares is known as equity | What Is It? | Loan funds | Own funds | Reflects | Obligation | Ownership | Term | Comparatively short term | Long term | Status Of Holder | Lenders | Proprietors | Risk | Less | High | Types | Term loan, debentures, bonds etc. | Shares and stocks | Return | Interest | Dividend | Nature Of Return | Fixed and regular | Variable and irregular | Collateral | Essential to secure loans but funds can be raised otherwise also | Not required |
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| Status Of Holder | Lenders | Proprietors | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>3 What are leverage ratios? Explain any two types of the same.</p> <p>4.3.4 Capital Structure Ratios</p> <p>Capital structure of a company is the composition of total capital of the company between debt and equity. Debt to equity ratio and total debt ratios are commonly used capital structure ratios. It provides us the information how is company financing the assets.</p> <p>4.3.4(A) Debt-equity Ratio</p> $= \frac{\text{Total debt}}{\text{Total equity}}$ <p>4.3.4(B) Total Debt Ratio</p> $= \frac{\text{Total debt}}{\text{Total Capital}} = \frac{\text{Total Debt}}{\text{Total Debt} + \text{Total Equity}}$ <p>Low debt to equity ratio or lower debt ratio means that the company is financing its business using own sources. As company does not have to make any fixed payments to equity shareholders, it is less risky source of funding. Hence, companies with low levels of assets and operating in competitive or uncertain business environment will choose to finance their assets using equity than debt. Companies having large asset base and having predictable cash flows will choose higher level of debt financing. Utility companies, power generation companies, raw material etc. use debt as main source of funding. Debt is called leverage and companies having higher debt are termed as leveraged companies.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| 4 | <p>How and why are risk and return considered significant factors in finance management?</p> |
| 5 | <p>What is mezzanine financing? Explain with an example.</p> <p>7.2.4 Mezzanine Finance</p> <ul style="list-style-type: none"> Mezzanine financing is a hybrid between debt and equity which provides the financier right to convert mezzanine debt to equity in case of default. It provides company capital to undertake riskier projects and is typically used in financing risky acquisitions by group of investors on the balance sheet of the company. <p>Features of mezzanine financing</p> <ul style="list-style-type: none"> In terms of seniority of repayment mezzanine loans are subordinate to senior debt, but higher in priority over equity shareholders. Mezzanine loans are unsecured in nature and carry higher rate of interest than debt. Mezzanine lenders generally receive warrant to convert into equity at pre agreed price, in case mezzanine loans are not repaid at the time of maturity. Mezzanine loans can be restructured into senior debt by the company. <p>Advantages</p> <ul style="list-style-type: none"> Interest paid on mezzanine debt is tax deductible. It is an unsecured source of funding for the borrower and help obtain funding in riskier projects. Mezzanine financing offer flexibility of structuring repayment as per cash flows. Owners may not lose control or dilution if the company meets obligations. Many times mezzanine financiers also bring expertise to manage business. <p>Disadvantages</p> <ul style="list-style-type: none"> Lender may put restrictive covenants on the company. Interest rates on mezzanine debt are typically very high. |

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| 6 | <p>Describe in brief the Net income Approach as a Capital Structure theory.</p> <p>7.5.2(A) Net Income Approach</p> <ul style="list-style-type: none"> Net income approach proposed by Durand in 1952, suggests that value of the firm can be increased by increasing the financial leverage. <p>Assumptions</p> <ul style="list-style-type: none"> Cost of debt is generally lower than the cost of equity as the weightage of debt in total capital increases, WACC goes down. Net income approach assumes that the cost of equity and cost debt remains constant with increase in financial leverage. According to this approach, cost of capital of the firm changes with the change in the financial leverage. Company's capital structure has two elements i.e. debt and equity. Weighted average cost of capital also known as WACC is the cost of capital for the firm and it is sum of the weighted average cost of equity and debt. <p>$\text{WACC} = \text{Cost of Equity} \times \text{Equity weight} + \text{Cost of Debt} \times \text{Debt weight}$</p> <p>In this approach,</p> $\begin{aligned}\text{Value of the firm} &= \text{Value of equity} + \text{Value of debt} \\ &= \frac{\text{Net income}}{\text{Cost of equity}} + \frac{\text{Interest}}{\text{Cost of debt}}\end{aligned}$  |

$$\begin{aligned}
 &= \frac{NI}{k_e} + \frac{I}{k_d} \\
 \text{Value of the firm} &= \frac{\text{Net operating income}}{\text{Weighted average cost of capital}} \\
 &= \frac{\text{NOI}}{\text{WACC}}
 \end{aligned}$$

Where

k_e - Cost of Equity

k_d - Cost of Debt

WACC - Weighted average cost of capital.

Illustration

ABC Ltd has EBIT (i.e., Net Operating income) is Rs. 50,000; cost of equity (k_e) at 15% and cost of debt (k_d) at 8%. Total capital is Rs. 400,000. Calculate cost of capital and value of the firm under different combinations of capital structure i.e. using leverage (debt to total capital) of 20%, 50%, 80% and 100%.

Answer

| Investment | 400,000 | 400,000 | 400,000 |
|--|-----------------|-----------------|-----------------|
| Debt ratio | 20% | 50% | 80% |
| Debt Amount | 80,000 | 2,00,000 | 3,20,000 |
| Interest rate | 8% | 8% | 8% |
| Net Operating Income (EBIT) | 50,000 | 50,000 | 50,000 |
| Less: Interest | 6,400 | 16,000 | 25,600 |
| Earnings for shareholders (NI) | 43,600 | 34,000 | 24,400 |
| Cost of Equity (K_e) | 15% | 15% | 15% |
| Market Value of Equity (NI/K_e) | 2,90,667 | 2,26,667 | 1,62,667 |
| Market Value of Debt (Debt amount) | 80,000 | 2,00,000 | 3,20,000 |
| Total value of the firm (Debt + Equity) | 3,70,667 | 4,26,667 | 4,82,667 |

From the above example, it is clear that the value of firm increases at the proportion of low cost capital i.e. with increase in debt capital. Net income approach assumes that the cost of equity remains the constant with the change in leverage.

- 7 Explain various Financial Instruments in detail

1.7 Financial Instruments

Financial Instruments or products comprise of short term and long term instruments. Short term instruments are also called money market instruments. We have been discussed in detail about money market instruments in the money market section 1.4.2 of the financial markets, hence we have only listed only these instruments in the below paragraphs. Long term or capital market instruments are discussed in more details in following paragraphs

1.7.1 Money Market Instruments

1. Call money/notice money
2. Treasury bills
3. Commercial Paper



4. Commercial Bill
5. REPO
6. Certificate of Deposit
7. Money Market Mutual Fund

These instruments have been discussed in detail in the money market section.

1.7.2 Capital Market Instruments

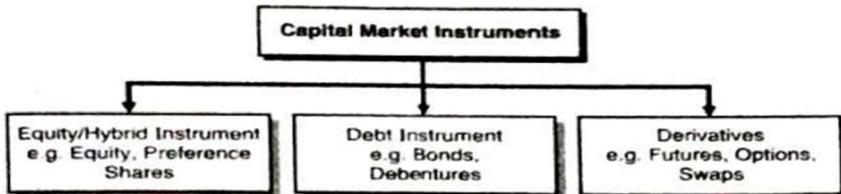


Fig. 1.7.1

1.7.2(A) Equity Shares

- Equity shares also called ordinary shares of a company and represent proportionate ownership in the company. Share capital also called as ownership capital of the company, is divided into a number of equity shares and each share represents ownership in the company.
- A company issues new shares when it requires long term funds. Equity share capital is the source of risk capital for the company.
- Equity share issuance is the most preferred route for raising long term risk capital for the companies as this provides access to capital without any fixed commitment like interest payment etc. Company makes payment of dividend to the shareholders only after servicing the interest and tax payments.
- Equity share are lowest in terms of claims over the assets and earnings of the company. In case the company suffers heavy losses and ends up bankrupt, the holders of the equity shares are the last ones to get their money back after creditors, bondholders, and holders of preference shareholders.
- Shares of listed public companies can be bought and sold the on stock exchanges thus providing liquidity to the shareholders.

1.7.2(B) Preference Shares

- Preference shares are also part of the share capital of the company. They carry preferential right over the dividend in comparison to equity shares of the company.
- Preference shareholders generally get fixed dividend which is much higher than equity shareholders.



- Preference shareholders don't get voting rights in the company.
- In case of liquidation of the company, preference shareholders are paid before equity shareholders, but are lower in priority compared to financial and operation creditors of the company.

1.7.2(C) Bonds and Debentures

- The terms, bond and debenture are used interchangeably on many occasions and represent long term debt instruments (in the nature loan) of more than 1 year.
- These are issued by Corporates, Government, Autonomous bodies, Municipalities, Financial Institutions etc. to meet their long term funding requirements.
- Debentures issued by Government are called Government Securities or G-sec, while debentures issued by Corporates are called Corporate bonds.
- Bond/debenture issuers pay interest also called as coupon at regular intervals (monthly, semi-annually or annually) and principal amounts on maturity to the holders of these instruments.
- Bonds generally have a fixed maturity period (repayment period). However sometimes highly rated companies issue bonds without any fixed maturity called as perpetual bonds. In case of perpetual bonds, company needs to only service interest to the bondholders at the fixed interval.
- They are either secured by a collateral or claims over assets of the company or unsecured in nature.
- Bonds/debentures are freely transferable and may or may not be listed on stock exchanges.
- Bonds/Debentures also classified as convertible and non-convertible debentures/bonds. A convertible instrument can be converted into equity after a fixed maturity.

1.7.2(D) Derivatives

A Derivatives instrument derives its value from one or more its underlying assets such as equity shares, bonds, foreign currency etc. It represents contract over the future estimated market value of an underlying securities. Futures/Forwards, Options and Swaps are the most common derivative contracts

Futures : These are financial contracts in which both parties agree to buy and sell the underlying asset/security at a pre-agreed price on a specified future date. Future contracts trade on stock exchanges. For example, future contract of Reliance Industries shares dated 2 months from current date indicates the rate price at which a buyer and seller are ready to buy or sell at a future date. Similarly contracts when entered in case of currencies or commodities they are called as forwards. Both the buying and selling party are bound by the contract.

- **Option :** Options contracts are instruments that give the holder of the instrument the right to buy or sell the underlying asset at a pre-agreed price at a future date. Buyer of the option has to pay a premium for right to buy or sell the security. Seller of this option also called option writer receives the premium for agreeing to sell or buy the asset at a pre-agreed price at a future date. An option to buy is called as Call option, while an option to sell is called Put option. When the price of underlying security on future date is higher than the pre-agreed price, the holder of the option can buy the asset at a pre-agreed price and sell at higher price. In case the price at a future date is lower, then holder option does not buy the asset.

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| 8 | <p>Suppose you deposit \$1,000 in an account that pays 12% interest, <u>compounded quarterly</u>. How much will be in the account after eight years if there are no withdrawals? Explain concept of Annuity in detail</p> $A = P[1 + (r/4)/100]^4t$ <p>P = 1000 r = 12 t = 8 Ans. 2575.0827 ????</p> |
| 9 | <p>Explain various Techniques of inventory Management</p> <p>6.2.1 Inventory Management Techniques</p> <ul style="list-style-type: none"> • There are many motives and advantages of holding inventory viz. flexibility in production, take price advantage that comes with bulk purchase, smooth fulfilment of customer demand etc. • The disadvantages of holding excess inventory are cost of storage, cost of funds on the capital blocked in inventory, dangers of obsolescence etc. • As long as the benefits of holding inventory outweigh the cost of inventory, management will prefer to hold inventory. • Let's study the principles of inventory control that help in taking important decisions in inventory management such as how much to order? when to order? what to control? What is safety stock? <p>6.2.1(A) Economic Order Quantity (ECQ) (How much to Order?)</p> <ul style="list-style-type: none"> • One of the important considerations in inventory management is to determine how much inventory should be ordered. • In case of raw materials, it is the quantity of raw materials to be ordered in each order or in case of production of finished goods it's the decision on how much to manufacture in a production run. Whenever a firm buys and stores inventory it has to bear two major type of costs namely ordering costs and inventory carrying costs. • Ordering Costs are the costs associated with placing the order and include costs to prepare a purchase order, cost of transportation, inspecting, movement of order, storing, cost of issuing payments etc. These costs are fixed per order and increase with increase in number of order and reduce with increase in size per order. • Carrying Costs are the costs associated with holding and storing unsold goods. These include costs of warehousing, salaries, transportation and handling, taxes, and insurance, depreciation, shrinkage etc. The inventory carrying cost increases with the increase in the level of inventory. |

- Economic order quantity is a scientific method to calculate most economic quantity of inventory that minimize the total of ordering and carrying costs. There are 3 variables involved in calculation of EOQ. These are the :

 - Demand of product** : The number of units of the product forecasted to be sold over a given time period (usually a year), expressed as A.
 - Ordering cost** : Ordering cost per purchase order expressed as O.
 - Carrying cost** : Carrying cost per unit, assuming the item is in stock for entire period, expressed as c.

If Q is the order quantity per purchase order or, then the total ordering cost for a year will be

$$TOC = \frac{A \times O}{Q}$$

If the usage of inventory is constant for each period, then

average inventory can be expressed as $\frac{Q}{2}$

$$\begin{aligned} \text{Total carrying cost (TCC)} &= \text{Carrying cost per unit} \times \text{Average inventory} \\ TCC &= \frac{Q \times c}{2} \end{aligned}$$

Total Inventory Cost (TC) is the sum of total ordering cost and total carrying cost.

$$TC = TOC + TCC$$

$$TC = \frac{A(O)}{Q} + \frac{Q(c)}{2}$$

As discussed above, EOQ refers to the quantity Q, where TC is minimized. We can use calculus to find the lowest point on the total inventory cost curve. The resulting EOQ is,

► Formula : $Q = \sqrt{\frac{2AO}{c}}$

Illustration

Let's take an example on use of EOQ method. Suppose that usage of an inventory item is 2000 in a year and ordering costs and carrying costs are Rs. 100 per order and are Rs. 10 per unit respectively. The EOQ expressed as Q is calculated as below :

$$\begin{aligned} Q &= \sqrt{\frac{2(2000)(100)}{10}} \\ &= \sqrt{2(2000)(100)} \\ &= 200 \text{ units.} \end{aligned}$$

Working Capital Management

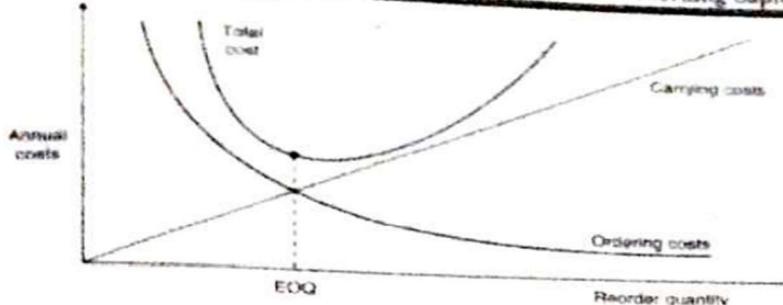


Fig. 6.2.1

- In the Fig. 6.2.1, we have plotted total ordering costs; total carrying costs; and total inventory costs (which is sum of the first two costs).
- We see that whereas total carrying costs vary directly with the size of the order, total ordering costs vary inversely with order size. The total inventory costs sum total of ordering and carrying costs decline at first as the fixed costs of ordering are reduced with larger orders. However, the total inventory costs start rising when the additional carrying costs start offsetting decrease in total ordering costs due to a larger average inventory.
- The point EOQ, represents the economic order quantity, which minimizes the total cost of inventory.

6.2.1(B) Reorder Point (When to Order?)

- In addition to knowing how much to order, when to order or reorder point is another important decision in inventory management function. To calculate the reorder point, we need to consider the time elapsed between placement of order of an item to receipt in the inventory, also called as Lead time. Reorder point can be calculated as below

$$\text{Reorder point} = \text{Lead time} \times \text{Average usage}$$

- Suppose it takes 5 days between the placement and receipt of an order. The EOQ order size was 200 units and a daily usage of 20 units, resulting in an order being placed (and filled) every 10 days. The reorder point for the firm will be expressed as,

$$\text{Reorder point} = 5 \times 20 = 100 \text{ units.}$$

- So the firm needs to place an order when the inventory falls to 100 units, as it will take 5 days to receive inventory by which time the existing stock will be exhausted.

6.2.1(C) Safety Stock

- The calculation of reorder point assumes that the lead time and average usage are always known with certainty.



- In practice, however the demand for product as described by usage and the lead time are not entirely certain. If the actual usage is higher than estimated or if the lead time is higher than expected, a firm may face a situation of stock out.
- Therefore, it becomes imperative to maintain a safety stock to allow for uncertainty in demand for inventory as well as in lead time. Hence, reorder point need to recalculated to account for the safety stock.

$$\text{Reorder Point} = \text{Lead time} \times \text{Average usage} + \text{Safety stock}$$

- In the above example, if the expected stock out quantity is 5 units per day. Then the reorder point will be 100 units plus safety stocks of 25 (5×5) i.e. 125 units.

10 List various theories of capital structure. explain any one theory

Ans.

NET INCOME APPROACH (Explain from question 6)

NET OPERATING INCOME

TRADITIONAL APPROACH

MODIGLIANI - MILLER APPROACH TO CAPITAL STRUCTURE

11 Define risk and return. Explain Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio

We come across the sentences such as 'higher the risk, higher the reward' or 'no risk, no gain' in our everyday conversations. While intuitively we know the concept of **risk and return**, we will learn how to measure the **risk and return** in this chapter. We will also learn how to minimize risk for a required return or maximize returns for an acceptable level of risk.

2.1.1 Historical Returns – Return on Asset of a Single Security Portfolio

When we invest funds in financial assets such as fixed deposits, mutual funds, shares debentures etc., we earn returns in two forms

1. Income from the asset in the form of interest or dividend
2. Change in the price of asset known as capital gain or loss

So the total return is sum total of interest/dividend income and capital gain or loss.



Return is generally expressed in percentage terms and calculated as total return divided by the beginning investment return earned in the form of dividend income is called dividend yield, return in the form of interest income is called interest yield and return from change in price is called capital gain yield. Thus, total return expressed in percentage terms is sum of capital gain yield and interest yield or dividend yield.

Illustration : Let us consider an example. Let's assume we invested money in the shares of Reliance Industries Limited at the cost of Rs.2000 per share one year ago. Today after 1 year, price of Reliance shares appreciates to Rs.3000. During the year, Reliance also paid a dividend of Rs.100. Calculate the rate of return.

$$\text{Return } R = \frac{(3000 - 2000) + 100}{2000}$$
$$= \frac{1100}{2000} = 55\%$$

$$\text{Here } R = \frac{100}{2000} + \frac{3000 - 2000}{2000}$$

$$R = 0.05 + 0.50$$

$$R = 0.55 \text{ or } 55\%$$

Here, 5% is known as dividend yield and 50% is known as capital gain yield.

In general, the return R for a year is can be calculated as below:

$$R = \frac{\text{DIV}_1 + (P_1 - P_0)}{P_0}$$

$$R = \frac{\text{DIV}_1}{P_0} + \frac{P_1 - P_0}{P_0}$$

...(2.1.1)

where

DIV_1 - Dividend received during the year

P_1 - Price at the end of the period

P_0 - Price at the beginning of period

R - Return for the period.

Illustration 2 negative returns

Let's take one more example. Assume that you invest funds in shares of Suzlon Energy Limited at a price of Rs.7 per share. Company is making a loss and hence does not declare any dividend. Further at the end of the year price of share drops to Rs.5. Calculate the rate of return

$$\begin{aligned} R &= \frac{DIV_1}{P_0} + \frac{P_1 - P_0}{P_0} \\ &= \frac{0}{7} + \frac{5 - 7}{7} = \frac{-2}{7} = -28.6\% \end{aligned}$$

The investment in shares of Suzlon yielded returns of - 28.6% consisting of - 28.6% capital gain yield and 0% dividend yield.

2.1.8(A) Returns in Two Security Portfolio - Historical

When we invest funds in a portfolio consisting of two securities, rate of return is calculated based on proportion of each security in total investment and rate of return for each security. Such rate of return is called rate of return on the portfolio and expressed as R_p .

$$R_p = w_1 R_1 + w_2 R_2$$

Where,

w_1 - Weightage of security 1 in the portfolio

R_1 - Rate of return for security 1

w_2 - Weightage of security 2 in the portfolio

R_2 - Rate of return for security 2

Illustration

Let's say we invested funds in a portfolio consisting of two securities A and B in the proportion of 30% and 70% respectively. Shares of company A provided a return of 24% while shares of company B provided 8% returns. Calculate the rate of return for the portfolio.

Answer

$$\begin{aligned} R_p &= (0.30)(24) + (0.70)(8) \\ &= 7.2 + 5.6 = 12.8\% \end{aligned}$$

2.1.5 Expected Returns of Single Security

In the previous examples we calculated risk and returns based on historical information. We can also calculate risk and returns based on the expected returns. For this we list rate of returns expected under possible scenarios and assign probability to each of the possible scenarios. Expected return is equal to the weighted average of rate of returns under all the possible outcomes.

Expected Rate of Return expressed as $E(R)$ can be calculated as below

$$E(R) = \sum_{i=1}^n R_i P_i \quad \dots (2.1.5)$$

Where

P - Probability of the outcome

R - Rate of Return

i - ith outcome

n - Total number of possible outcomes

Illustration

Let's take an example of security XYZ Ltd whose possible returns under various scenarios are tabulated as below :

Table 2.1.2

| Scenario | Probability (P_i) | Rate of Return Return (%) (R_i) | Expected Rate of Return (P_i) (R_i) |
|-----------------|-----------------------|--|--|
| Negative growth | 0.20 | - 10 | (0.20)(- 10) |
| Stable growth | 0.30 | 10 | (0.30)(10) |
| High growth | 0.50 | 20 | (0.50)(20) |
| Total | 1.00 | | 11.00 |

Based on the Table 2.1.2, expected return will be calculated as below:

$$E(R) = (0.20)(-10) + (0.30)(10) + (0.50)(20) = 11\%$$

Variance of returns in the above example will be calculated as below:

2.1.8(B) Expected Return of Two Security Portfolio

Similarly, we can calculate expected return of portfolio by adding the weightage average returns of the portfolio in different scenarios.

$$E(R_p) = w E(R_A) + (1 - w) E(R_B) \quad \dots (2.1.8)$$

Where

w - Weightage of security A in the portfolio

1 - w - Weightage of security B in the portfolio

$E(R_A)$ - Expected return of security A

$E(R_B)$ - Expected return of security B

$E(R_p)$ - Expected return of portfolio

We can extend the above formula for Expected Return of Portfolio for any no of securities.

Illustration

We are planning to invest 30% of the amount in security A and 70% of the amount in security B. Table 2.1.3 provides expected rate of returns of security A and security B under different scenarios. Let's calculate the expected rate of return of the portfolio.

Table 2.1.3

| Scenario | Probability (P_i) | Rate of Return of Security A (30%) | Rate of Return of Security B (70%) | Portfolio Return | Expected Rate of Return of Portfolio (P_i) (R_p) |
|-----------------|-----------------------|------------------------------------|------------------------------------|-------------------------|--|
| . | 2 | 3 | 4 | $(0.30)(3) + (0.70)(4)$ | |
| Negative growth | 0.20 | - 10 | 10 | 4.0 | 0.80 |
| Stable growth | 0.30 | 10 | 20 | 17.0 | 5.10 |
| High growth | 0.50 | 20 | 4 | 8.80 | 4.40 |
| Total | 1.00 | | | | 10.30 |

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|----|--|
| 12 | <p>Explain Financial Statements—Balance Sheet, Profit and Loss Account, and Cash Flow Statement Refer pdf</p> |
| 13 | <p>Explain various decisions in corporate finance. Also explain Current ratio, Quick ratio and composite ratio</p> <p>COMPOSITE RATIO NHI MILA</p> <p>4.1.1(A) Investment Decisions</p> <ul style="list-style-type: none"> • On an ongoing basis, finance manager needs to take decisions on creation or acquisition of long term and short-term assets. These decisions include selection of projects/assets for investment, period of investments, period for investment etc. • The decisions of investment in long term assets involve large sums of money and are expected to provide returns over a longer period. These decisions are also called capital budgeting decisions. • Every long-term investment decision will involve an element of risk. Risk and returns from investments are interrelated and the financial manager need to strike an optimal balance keeping overall objective of the firm in mind. • This balance of risk and reward is called as the risk reward trade-off. • A finance manager needs to evaluate multiple investment options before finalizing the optimum investment for the company. • Capacity expansion, purchase of equipments, land and building, mergers and acquisitions are examples of capital budgeting decisions. Divestment or sale of assets also fall in the domain of capital budgeting decision. <hr/> <div style="display: flex; justify-content: space-between; align-items: center;">  Finance Management (MU) 4-3 Financial Management </div> <ul style="list-style-type: none"> • Finance manager is expected to take investment decisions that will maximize the value of the company. • Short term investment decisions involve investment in current assets such as stock, debtors, fixed deposits etc. and are called working capital decisions. • A finance manager needs to create policies for the level of stock to be maintained, credit period to be granted to buyers, purchase of raw material on cash or credit, investment of short-term funds into mutual funds, fixed deposit etc. • Working capital decisions are taken keeping in mind impact on profitability and requirement of liquidity for the business. Due to growing uncertainty in business in the backdrop of shorter economic cycles and rapid technological changes, a large business prefers higher level of liquidity. |

4.1.1(B) Financing Decisions

- Finance manager needs to raise funds to meet the investment requirements of the firm. Funding can be raised by taking on debt (loan funds) or equity or combination of both. The mix between equity and debt is called as the capital structure.
- Use of more debt will mean that the number of shareholders will remain same and may increase profit available for shareholders. However, it also leads to higher risk as debt involves fixed expenses towards interest and repayment of debt irrespective of the performance of the firm.
- Use of equity provides flexibility; however it comes at higher cost as the shareholders demand higher return compared to debt holders.
- Finance manager needs to maintain optimum capital structure that helps to maximize value of the firm for acceptable level of risk. A finance manager will look at multiple factors before choosing a funding such as rate of interest, availability of external funding, risk profile of the project, estimated timeframe of returns from the project etc.

4.1.1(C) Dividend Decisions

- Third important decision for a finance manager is distribution of profits, known as dividend decision. This decision involves decision on how much profit to be retained in the business vis-a-vis distribution to shareholders.
- Depending on growth opportunities available for the company, cash balance of the company and requirement of funds, finance manager will take decision on retention of the profits.
- Shareholders of the company having good opportunities for growth, will prefer to retain higher share of profits in the company, which it can reinvest the profits in the business to generate higher returns.



- This will increase the value of the firm and shareholder can earn returns in future from capital appreciation. Percentage of profit retained in the business is called as the retention ratio, while percentage of profits distributed to shareholders is called as dividend payout ratio. Firms having limited investment opportunities or investment requirements will prefer to have high payout ratio.
- Dividends are generally taxed at higher rate in most of the countries, hence companies choose to buy back shares to reward shareholders instead of declaring large dividends.

4.3.1(A) Current Ratio

- Current ratio is the ratio of current assets to the current liabilities of the company and represents company's ability to repay current liabilities using current assets. Current liabilities are the financial obligations that are repayable within one year.

► Formula : Current ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

- Current assets include those assets that can be converted into cash within one year without adversely impacting value of the assets and include stock of raw materials, finished goods, work in progress, debtors, cash and marketable securities.
- Current ratio of less than 1 is considered unsatisfactory and indicate that current assets don't fully cover current liabilities. Current ratio between 1 to 2 is considered satisfactory, while more than 2 indicate company's funds may be locked in unproductive assets. In addition to the ratio, it is important to understand the composition of current assets as it will affect the company's ability to liquidate them and convert to cash.
- For example, non-moving stocks or debtors appearing in current assets may be very difficult to convert to cash.

4.3.1(B) Quick Ratio

Quick ratio also called as acid test ratio is the ratio of liquid assets to the current liabilities and used to measure company's ability to service current liabilities using liquid assets. While calculating quick ratio Inventories are subtracted from current assets as early clearance of inventory may lead to loss of value.

► Formula : Quick ratio (acid test ratio) = $\frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$

- 14 What are financial institutions? Explain various types in detail
Refer pdf

15 Julie Miller is evaluating a new project for her firm, Basket Wonders (BW). She has determined that the after-tax cash flows for the project will be \$10,000; \$12,000; \$15,000; \$10,000; and \$7,000, respectively, for each of the Years 1 through 5. The initial cash outlay will be \$40,000.

Calculate payback period. also comment on strength and weakness of payback period

Ans.

~~firm w~~

Methodology for using payback period as mentioned below

1. Calculate the cash inflows and outflows for each period
2. Calculate cumulative cash flow at the end of each period
3. Calculate the point of time in year at which the cumulative cash flows equal zero.

Illustration

A firm decides to invest Rs.5 Cr in setting up of garment manufacturing plant. It is expected to take 1 year to set up the plant and start the production. Cash flows after the start of production are as mentioned in the below table. What is the **payback period**?

$CF_0 = -500$ Lakh ; $CF_1 = 100$ Lakh, $CF_2 = 175$ Lakh, $CF_3 = 225$ Lakh, $CF_4 = 225$ Lakh,
 $CF_5 = 150$ Lakh

Cumulative cash flows at the end of each year.

Table 5.2.2

| Year | Cash Flow | Cumulative Cash Flow |
|------|-----------|----------------------|
| 0 | - 500 | - 500 |
| 1 | 100 | - 400 |
| 2 | 175 | - 225 |
| 3 | 225 | 0 |

From the Table 5.2.2, we understand that cumulative cash flows become zero at the end of year 3. Hence, **payback period** is 3 years.

Acceptance Rule for Payback Period

- Management can decide on maximum **payback period** for accepting any investment projects. All projects having payback period less than the threshold payback period are accepted.
- In case of mutually exclusive projects, projects with lowest **payback period** is chosen.

At last b/w yrs 3 and 4 :

After 3 yrs cumm. Cash flow = $40000 - 10000 - 12000 - 15000 = -3000$

And cash flow of 4th yr = 10000

No. of yrs required for recovery of 3000 = $(3000 / 10000) = 0.3$
 payback period = $3 + 0.3 = 3.3$

| | Differentiate between ordinary annuity and annuity due with examples. | | | | | | | | | | | | |
|----------------------|--|---|------------------|-------------|---------|--|---|---------|---|---|-----------------|----------|----------|
| 16 | <table border="1"> <thead> <tr> <th>BASIS FOR COMPARISON</th> <th>ORDINARY ANNUITY</th> <th>ANNUITY DUE</th> </tr> </thead> <tbody> <tr> <td>Meaning</td><td>Ordinary annuity is one in which the inflow or outflow of cash fall due for payment at the end of each period.</td><td>Annuity due is described as the series of cash flows occurring at the beginning of each period.</td></tr> <tr> <td>Payment</td><td>Belongs to the period preceding its date.</td><td>Belongs to the period following its date.</td></tr> <tr> <td>Appropriate for</td><td>Payments</td><td>Receipts</td></tr> </tbody> </table> | BASIS FOR COMPARISON | ORDINARY ANNUITY | ANNUITY DUE | Meaning | Ordinary annuity is one in which the inflow or outflow of cash fall due for payment at the end of each period. | Annuity due is described as the series of cash flows occurring at the beginning of each period. | Payment | Belongs to the period preceding its date. | Belongs to the period following its date. | Appropriate for | Payments | Receipts |
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| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 17 | <p>Explain any 5 types of money market instruments in brief.</p> <p>1. Call market (call money)</p> <ul style="list-style-type: none"> Call Money, Notice Money and Term Money markets are sub-markets of the Indian money market. Call Money refers to the borrowing or lending of funds for 1 day. Notice Money 2-14 days and Term Money more than 14 days upto 1 year. Call Money/notice money market is also known as Inter-Bank market. Lending and borrowing take place on unsecured or non-collateralized basis. The trades are conducted both on telephone as well as on the NDS Call system, which is an electronic screen based system set up by the RBI for negotiating money market deals between entities permitted to operate in the money market. The entities permitted to participate both as lender and borrower in the call/notice money market are Scheduled commercial banks (excluding Regional Rural banks), Co-operative Banks and Primary Dealers (PDs). Select financial institutions, insurance companies and mutual funds can participate only as lenders. <p> Finance Management (MU) 1-8 Overview of Indian Financial System</p> <ul style="list-style-type: none"> Primary Dealers (PDs) are Discount and Finance House of India Ltd. (DFHI) and Securities trading corporation of India (STCI) were established in 1988 and 1994 respectively to develop the secondary market for money market instruments. <p>2. Treasury bills</p> <ul style="list-style-type: none"> Treasury bill also known as T-bill is an instrument of short term borrowing for Government of India. Treasury bills are issued by the Central bank (RBI) on behalf of Government of India to meet short term funding requirements of the Government and to manage liquidity in the financial system. Treasury bills are not issued by state governments. Treasury bills are issued of mainly 3 maturities, namely 91 days, 182 day and 364 day treasury bills. Treasury bills are issued through auctions at a discount and repaid at par at the time of maturity (same as face value). For example, a Treasury bill having a maturity of 364 days and face value of Rs.100 will be issued at a price lower than 100, let's say Rs.96 and at the maturity Rs.100 will be paid to the investor by the Government. The difference between Rs.100 and Rs.96 will be the return by the investor. As the Treasury bills are issued by Government of India, there is no risk of default. The minimum amount in which they can be traded is Rs 25,000. | | | | | | | | | | | | |

3. Commercial bills

- Commercial bill refers to an accepted bill raised by seller on buyer and duly accepted by the buyer. When goods are sold on credit, the seller draws a bill of exchange on the buyer for the amount due. The buyer accepts it and returns to the seller.
- The accepted bills signify unconditional agreement to repay the seller agreed amount at the end of credit period.
- When trade bills are accepted by commercial banks, they are called commercial bills. These are negotiable instruments and are generally issued for 30 days to 120 days.
- The seller may either retain the bill till maturity or due date or get it discounted from some banker and get immediate cash. The amount discounted is repayable on maturity of the bill.
- In case of need for funds, the bank can rediscount the bill in the money market and get ready money. In India, the participants of the commercial bill market are banks and financial institutions. The bill market in India is not well developed.

4. Certificate of deposits

- Certificate of Deposits also known as CDs have a maturity period between 7 days to 1 year. Most common tenor of CDs are 3, 6 and 12 months. CDs are issued in a dematerialized form, at a discount to face value and redeemed at face value.

- It is a negotiable money market instrument, like a promissory note (Promissory denotes a promise to pay the lender certain amount at the end of agreed credit period).
- All scheduled commercial banks excluding Regional Rural Banks (RRBs) and Local Area Banks (LABs) and all India Financial Institutions permitted by RBI are eligible to issue certificates of deposits. CDs are mainly subscribed to by banks, mutual funds, provident and pension funds and insurance companies.
- The minimum amount of a CD is Rs. 1 Lac and in multiples of Rs 1 Lac thereafter.

5. Commercial paper

- Commercial paper is another money market instrument in the form of promissory note and popularly referred to as CP. It is a short-term unsecured money market instrument, of maturity from 7 days to 1 year. These are issued at a discount to face value and redeemed at par.
- Corporates, Primary Dealers (PDs), and all-India financial institutions (FIs) that have been permitted to raise short-term resources by Reserve Bank of India are eligible to issue CP. It is a very popular avenue for raising short term funds for corporates. These can be issued in denominations of Rs.5 lakh or multiples thereof.
- All eligible issuers are required to obtain a credit rating for issuance of Commercial Paper from a credit rating agency as may be specified by the Reserve Bank of India from time to time.

6. Money market mutual funds (MMMFs)

- The money-market mutual funds were introduced by RBI in 1992 and since 2000 they are brought under the regulation of SEBI.
- It is an open-ended mutual fund which invests in short-term debt securities. This provides an additional short-term investment avenue for corporate and individuals.

7. Repo and the reverse repo market

- Repo means "Repurchase Agreement" and refers to selling specified securities under an agreement to repurchase it at a predetermined date and rate. Under repo, the seller gets immediate funds by selling specified securities with an agreement to repurchase the same at a mutually decided future date and price.
- A repo transaction for one counterparty becomes a reverse repo transaction for the other counter party. At present, securities acceptable under repo transactions Central Government dated securities (G-Secs), Treasury Bills (T-Bills), State Development Loans (SDLs) and Corporate Bonds. The entities permitted to undertake repo transactions include Scheduled Commercial Banks, Co-operative Banks, Primary Dealers, Mutual Funds, Insurance Companies and corporate entities.



8. Inter-corporate Deposits

- An Inter-Corporate Deposit (ICD) is an unsecured borrowing by corporates and Financial Institutions from other corporate entities registered under the Companies Act 1956 on unsecured basis. The corporate having surplus funds can lend to another corporate in need of funds.
- The short term credit rating of the borrowing corporate would determine the rate at which it would be able to borrow funds. The tenor of ICD may range from 1 day to 1 year, but the most common tenor of borrowing is for 90 days. Primary Dealers are permitted to borrow in the ICD market. Primary Dealers cannot lend in the ICD market.

9. Discount and Finance House of India (DFHI)

- It is a primary dealer and deals in treasury bills, commercial bills, CDs, CPs, short term deposits, call money market and government securities. It was established in 1988 by RBI and is now brought under control of SBI.
- Establishment of DFHI has helped to develop an active secondary market in Money Market Instruments.

| | |
|---|--|
| 18 | Describe the relation between Capital Structure and Corporate Value. |
| 19 | What are the factors affecting an Entity's Working Capital Needs? |
| 6.1.5 Factors Affecting Working Capital Needs | |
| <ul style="list-style-type: none"> • Nature of Business : Nature of business has most significant influence on the working capital requirement of the company. Trading or retail companies need to carry inventory of variety of products and has substantial investment in inventory. Such companies hold majority of assets in the form of inventory i.e. current assets. Similarly, construction companies need to carry inventory and also have to deal with high receivables especially in government sector, in turn deal with high working capital requirement. On the other hand, utilities such as telecom companies, electricity have very large investment in fixed assets and low requirement of working capital. | |
| <ul style="list-style-type: none"> • Seasonal Factors : Seasonality plays a very important role in determining current assets that company need to maintain. During the peak period, firm will need to maintain large inventory to meet high demand and during the slack season inventory will be lower. For a manufacturing company it may not be feasible to increase production substantially at a short notice due to constraints of capacity, impact on quality and price. Hence to avoid loss of business, manufacturing companies choose to maintain level production throughout the year. | |
| | |
|  Finance Management (MU) | |
| 6-5 | |
| Working Capital Management | |
| <ul style="list-style-type: none"> • Cyclicality : Companies operating in cyclical industries respond to the demand situation and adjust current assets accordingly. In the cyclical upturn, when business is witnessing high demand, companies will like to maintain high current assets to capitalize on the opportunity. In downturn, companies will like to work with minimum investment in current assets to overhead and financing costs. • Credit Policy : Debtor days of the company is largely driven by the credit policy adopted by the company. Large established companies need not extend credit to their customers, while companies looking to penetrate into market may choose to extend credit as a tool to establish themselves. Credit policies of the companies are largely influenced by the prevalent industry practices. For example, retail shops need not extend credit to the customers, however wholesalers and distributors may have to extend credit to achieve the sales targets. • Manufacturing Cycle/Technology : Manufacturing process used by company impacts the manufacturing cycle and in turn requirement of current assets. Use of less automation may help company to save on fixed asset investments, but will require large inventories due to longer manufacturing cycle. Further, flexibility of manufacturing technology also plays an important role. Companies having flexible manufacturing operations can use their capacity for manufacturing different products during slack period. Companies with inflexible manufacturing technique may choose to maintain steady level of production to avoid underutilization despite lower demand and can add to inventory levels. • Availability of Credit : Firms that are able to procure input materials on credit from suppliers can reduce their net working capital requirement and cash cycle by utilizing such credit. Liberal credit terms from suppliers can even allow some firms to operate with negative working capital. For example, some large retailers can easily a credit period of 60-90 days from their suppliers, maintain inventory of 30 days or less and sell in cash to retail customers and thus operating with negative working capital. • Operating Efficiency : Firms running operations in efficient manner can reduce the requirement of current assets. Operating efficiency has many facets. The factors such as easy availability of input materials, accurate sales forecasting and planning, utilization of resources etc. can substantially reduce need to carry inventory at all levels and reduce working capital requirements. Inefficient operations will require higher investment in current assets. • Scale of operations : Requirement of working capital generally reduces with increased scale of operations, as company has more flexibility. Sub-optimal operations require a firm to maintain higher of current assets. Smaller firms also find it easier to obtain working capital financing compared to long term loans. • Fluctuation in input prices : Investment in current assets are higher when the firm is exposed to fluctuation in input prices. In such cases, cost of raw material prices fluctuating, however firm has only limited flexibility to pass on price increases to end customers. In such cases, firm may need to invest large amount in current assets to take advantage of favorable input prices. | |

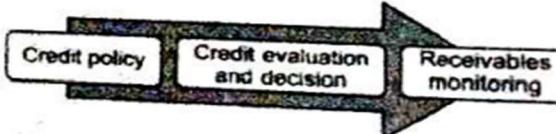
| | |
|--|---|
| | 20 Briefly explain the types of financial services |
| 21 | How does one manage the receivables under working capital management? |
| 6.3 Management of Receivables | |
| <ul style="list-style-type: none"> • Receivables is second major constituent of current assets and arise due to sale of product/service on credit to customers. These are also called as account receivables or trade receivables or trade debtors. • A company records the sale of goods/services as soon as it raises invoice for sale on customers, however the transaction is not complete till the time it realises consideration for the same. • One may argue that unlike inventory it is entirely the choice of the company to sell products on credit and in fact there are many businesses like retail who need not sell any product on credit. • The amount of trade receivables for a company will depend on percentage of credit sales by the company and credit period. For example, if a company has an average daily sales of Rs. 50,000 and sells 50% of products on credit at an average credit period of 45 days. The account receivables will be $50000 \times 50\% \times 45 = 11,25,000$. • There are many reasons for a business to sell products on credit like prevalent industry practice, meet short sales target, expansion in new area of business/geography etc., clearance of non-moving stock etc. The funds blocked in receivables need to be financed which implies cost for the company. Further, company need to incur additional costs like collection and potential bad debts due non-repayment. Hence, receivables need to be managed carefully. • There are three major aspects to management of receivables : <ol style="list-style-type: none"> 1. Credit Policy 2. Credit Evaluation and Decision 3. Receivables Monitoring  | |

Fig. 6.3.1

6.3.1 Credit Policy

The amount of trade receivables, period of trade receivables and terms related to credit are governed by the credit policy of the firm. The credit policy of a company is based on following variables

1. Credit standards
2. Credit terms
3. Collection policy.

Credit policy are expected to have bearing on sales of the company, bad debt, discounts etc. Let's examine these variable independently. The goal of the credit policy is to enhance shareholders' wealth by striking a balance between higher sales and risk.

6.3.1(A) Credit Standards

- Credit standards define the **minimum criteria for extending the credit to customers**. Based on credit standards company will decide which customers can avail credit from the company. Tight credit standards will limit the number of customers eligible for credit sales, but will also reduce the probability of bad debt and collection costs. Lenient credit standards will increase number of customers and sales but will also increase risk of bad debt and collection costs.
- Finance manager plays a role in credit analysis to determine credit worthiness of a customer. Creditworthiness depends on 3Cs i.e. Character, Capacity and Collateral. Collateral or security for granting the credit is generally provided by customers to banks for availing loans and may not be relevant for granting trade credit in most cases.
- **Character** refers to willingness of customer to pay and is moral factor responsible for repayment. **Capacity** refers to the ability of the customer to pay and is determined by the financial strength of the customer. Company can use tools such as **credit references, credit rating, analysis of financial statements, past repayment track record etc.** for **determining the creditworthiness of a customer**. This is explained in more details in later part of the chapter.

6.3.1(B) Credit Terms

- Credit terms refer to the terms on which trade credit provided by the company to its customers. These include **credit period, cash discount, penal charges or delayed payment charges**.
- **Credit period** refers to the length of time period for which credit is provided. Longer credit period means higher flexibility for customers and hence can lead to higher sales for the company. Higher sales and longer credit will also lead to increase in investment in receivables amount.



- If the increase in operating profit from higher sales can offset increased cost due to higher investment in receivables, higher credit period will have a favourable impact on profit of the company.
- Credit period is mentioned as 'net date'.
- For example, 'net 30' means customer has a maximum credit period of 30 days for payment. Cash discount is the discount offered by the company to customers for early payment. Company may need to provide credit to customers as per the industry policy, however by providing cash discount to customers it encourages customers to pay early and reduce in investment in receivables. Credit terms having cash discount and credit period will be stated the cash discount rate, period of cash discount for example, '2/5, net 60' refers to the credit term offering a cash discount of 2% for payment made within 5 days and credit period of 60 days.
- Credit terms sometimes also mention delayed payment charges to avoid delay in repayment by customers. Penal rate or delayed payment charges referred to rate of interest charged by companies to customers for any delay in payment.

6.3.1(C) Collection Policy and Efforts

- Collection policy refers to the set of collection procedures to ensure collection of trade receivables on due date. Having provided credit to customers, company can't simply expect all customers to pay on due date.
- Some customers delay the payments due to genuine or may be habitual late payers.
- The policy should be explicitly fix the responsibility of collection and follow up. Collection can be handed as a part of accounts or sales team.
- In any case efficient collection requires coordination between sales and accounts department. Sales department should use inputs from accounts department while granting credit to customers.
- Accounts department should coordinate with sales for recovering delayed payments. Some companies offer cash discounts to encourage customer to make payments before due date and also charge penal interest charges in case of delay in payment.
- The policy should prescribe set of actions for reminding customers to make regular payments, follow up for delayed payments and separate process to collect old and delinquent dues. Some customers have the habit of delaying the payments, regular follow up can discipline such customers to pay on time.
- Some customers may have genuine issues due to business downturn etc. and had to be handled carefully. An email should be promptly sent to customers in case of delay requesting to make the payment immediately.

22

ABBC Company is considering an investment Project A with the expected cash flows as shown below:

| Year | Project A (₹) |
|------|---------------|
| 0 | (1,000) |
| 1 | (1,200) |
| 2 | (600) |
| 3 | (250) |
| 4 | 2,000 |
| 5 | 4,000 |

What is the NPV if the interest rate is 8%. What is the IRR of the Project?
Should the company invest in the project?

Steps to calculate NPV

1. Calculate the opportunity cost of capital depending on the risk of the project.
2. Calculate net cash flows in each period. All cash outflows carry negative sign, while cash inflows have positive sign.
3. Calculate present value by discounting the cash flows.
4. Calculate sum of present values of cash flows.

► Formula : $NPV = - CF_0 + \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \frac{CF_3}{(1+i)^3} + \dots + \frac{CF_n}{(1+i)^n}$

► Formula : $NPV = - CF_0 + CF_1(PVIF_{1,i}) + CF_2(PVIF_{2,i}) + CF_3(PVIF_{3,i}) + \dots + CF_n(PVIF_{n,i})$

Where,

CF - Net Indicates cash flows in each period

i - Discounting rate

n - No of years

PVIF - Present value interest factor

Illustration

In the above example involving Rs.5 Cr investment let's calculate the NPV of project.

$$\begin{aligned} NPV &= -500 + \frac{100}{1.10} + \frac{175}{(1.10)^2} + \frac{225}{(1.10)^3} + \frac{225}{(1.10)^4} + \frac{150}{(1.10)^5} \\ &= -500 + 91 + 145 + 169 + 154 + 93 \\ &= 152 \end{aligned}$$

The NPV of the above project is Rs.152 Lakh and can be considered for investment.

The NPV of the above project is Rs.152 Lakh and can be considered for investment.

Acceptance Rule

1. Projects having positive NPV are accepted for investment.
2. In case of mutually exclusive projects, the project with highest NPV is chosen.

5.2.5 Internal Rate of Return (IRR)

Internal rate of return is the rate of return received by the company by investing in the project. It is the discount rate for which NPV of the project becomes zero. Internal rate of return is also termed as IRR. For decision making purpose, IRR of the project is calculated and compared with the required rate of return. All projects having an IRR more than the required rate of return are considered for investment. If a firm has to choose between mutually exclusive projects, project having the highest IRR is selected.

Steps to calculate IRR

1. Calculate the initial investment outflow.
2. Calculate net cash flows in each period. Cash outflows carry negative sign, while cash inflows have positive sign.
3. Calculate the discounted cash flows using IRR as discounting as rate.
4. Solve the equation for IRR for which NPV is zero.

Finance Management (MU) 5-9 Capital Budgeting

$$0 = -CF_0 + \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \frac{CF_3}{(1+IRR)^3} + \dots + \frac{CF_n}{(1+IRR)^n}$$
$$CF_0 = \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \frac{CF_3}{(1+IRR)^3} + \dots + \frac{CF_n}{(1+IRR)^n}$$

Formula : $CF_0 = \sum_{t=1}^n \frac{CF_t}{(1+IRR)^t}$

Illustration

In the above example involving Rs.5 Cr investment

$$500 = \frac{100}{(1+IRR)} + \frac{175}{(1+IRR)^2} + \frac{225}{(1+IRR)^3} + \frac{225}{(1+IRR)^4} + \frac{150}{(1+IRR)^5}$$

Solving above example using excel formula provides us the value of IRR as 20.3%.

Acceptance Rule

- Management will decide a cut-off or hurdle rate for acceptance of projects. All projects having IRR greater than the hurdle rate are accepted.
- In case of mutually exclusive projects, investment project having highest IRR is chosen.

- 23 The shares of Armstrong company has the following anticipated returns with associated probabilities:

| | | | | | | | |
|--------------------|------|------|------|------|------|------|------|
| Return (%) | -20 | -10 | 10 | 15 | 20 | 25 | 30 |
| Probability | 0.05 | 0.10 | 0.20 | 0.25 | 0.20 | 0.15 | 0.05 |

Calculate the expected rate of return and risk measures in terms of variance & standard deviation.

Expected Rate of Return expressed as $E(R)$ can be calculated as below

$$E(R) = \sum_{i=1}^n R_i P_i \quad \dots (2.1.5)$$

Where

P - Probability of the outcome

R - Rate of Return

i - ith outcome

n - Total number of possible outcomes

Illustration

Let's take an example of security XYZ Ltd whose possible returns under various scenarios are tabulated as below :

Table 2.1.2

| Scenario | Probability (P_i) | Rate of Return (%) (R_i) | Expected Rate of Return (P_i) (R_i) |
|-----------------|-----------------------|------------------------------|---|
| Negative growth | 0.20 | - 10 | (0.20)(- 10) |
| Stable growth | 0.30 | 10 | (0.30)(10) |
| High growth | 0.50 | 20 | (0.50)(20) |
| Total | 1.00 | | 11.00 |

Based on the Table 2.1.2, expected return will be calculated as below:

$$E(R) = (0.20)(-10) + (0.30)(10) + (0.50)(20) = 11\%$$

Variance of returns in the above example will be calculated as below:

2.1.6 Expected Risk of Single Security

In section 2.1.4 we calculated the risk of investment based on historical returns. The risk measures i.e. variance and standard deviation can also be calculated by assigning probabilities to expected returns. In the above example, returns from investment in XYZ Ltd are expected to vary between -10% to 20% under different scenarios. Risk associated with investment in XYZ Ltd will be calculated as below :

$$\begin{aligned} \text{Variance } (\sigma^2) &= (0.20)(-10 - 11)^2 + (0.30)(10 - 11)^2 + (0.50)(20 - 11)^2 \\ &= (0.20)(441) + (0.30)(1) + (0.50)(81) \\ &= 88.1 + 0.30 + 40.5 = 128.9 \end{aligned}$$

$$\text{Standard Deviation } (\sigma) = \sqrt{128.9} = 11.35$$

For large number of probable outcomes, variance can also be expressed as below:

$$\begin{aligned} \text{Variance } (\sigma^2) &= P_1 (R_1 - E(R))^2 + P_2 (R_2 - E(R))^2 + P_3 (R_3 - E(R))^2 + \dots \\ &\quad + P_n (R_n - E(R))^2 \\ &= \sum_{i=1}^n P_i (E_i - E(R))^2 \quad \dots (2.1.6) \end{aligned}$$

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Explain with suitable example the concept & importance of Economic Order Quantity.
Refer Q9 Inventory Management.