

Syllabus

Course Code	Course Name	Credits
ILO8022	Finance Management	03

Course Objectives : Students will try to :

1. Overview of Indian financial system, instruments and market
2. Basic concepts of value of money, returns and risks, corporate finance, working capital and its management
3. Knowledge about sources of finance, capital structure, dividend policy

Course Outcomes :

1. Understand Indian finance system and corporate finance
2. Take investment, finance as well as dividend decisions

Module	Detailed Content	Hours
01	<p>Overview of Indian Financial System : Characteristics, Components and Functions of Financial System.</p> <p>Financial Instruments : Meaning, Characteristics and Classification of Basic Financial Instruments-Equity Shares, Preference Shares, Bonds-Debentures, Certificates of Deposit, and Treasury Bills.</p> <p>Financial Markets : Meaning, Characteristics and Classification of Financial Markets-Capital Market, Money Market and Foreign Currency Market.</p> <p>Financial Institutions : Meaning, Characteristics and Classification of Financial Institutions-Commercial Banks, Investment-Merchant Banks and Stock Exchanges.</p>	06
02	<p>Concepts of Returns and Risks : Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio; Measurement of Historical Risk and Expected Risk of a Single Security and a Two-security Portfolio.</p> <p>Time Value of Money : Future Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Present Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Continuous Compounding and Continuous Discounting</p>	06

03	<p>Overview of Corporate Finance : Objectives of Corporate Finance; Functions of Corporate Finance-Investment Decision, Financing Decision, and Dividend Decision.</p> <p>Financial Ratio Analysis : Overview of Financial Statements-Balance Sheet, Profit and Loss Account, and Cash Flow Statement; Purpose of Financial Ratio Analysis; Liquidity Ratios; Efficiency or Activity Ratios; Profitability Ratios; Capital Structure Ratios; Stock Market Ratios; Limitations of Ratio Analysis.</p>	09
04	<p>Capital Budgeting : Meaning and Importance of Capital Budgeting; Inputs for Capital Budgeting Decisions; Investment Appraisal Criterion-Accounting Rate of Return, Payback Period, Discounted Payback Period, Net Present Value(NPV), Profitability Index, Internal Rate of Return (IRR), and Modified Internal Rate of Return (MIRR).</p> <p>Working Capital Management : Concepts of Meaning Working Capital; Importance of Working Capital Management; Factors Affecting an Entity's Working Capital Needs; Estimation of Working Capital Requirements; Management of Inventories; Management of Receivables; and Management of Cash and Marketable Securities.</p>	10
05	<p>Sources of Finance : Long Term Sources-Equity, Debt, and Hybrids; Mezzanine Finance; Sources of Short Term Finance-Trade Credit, Bank Finance, Commercial Paper; Project Finance.</p> <p>Capital Structure : Factors Affecting an Entity's Capital Structure; Overview of Capital Structure Theories and Approaches-Net Income Approach, Net Operating Income Approach; Traditional Approach, and Modigliani-Miller Approach. Relation between Capital Structure and Corporate Value; Concept of Optimal Capital Structure.</p>	05
06	<p>Dividend Policy : Meaning and Importance of Dividend Policy; Factors Affecting an Entity's Dividend Decision; Overview of Dividend Policy Theories and Approaches-Gordon's Approach, Walter's Approach, and Modigliani-Miller Approach.</p>	03

Module 1

Chapter 1 : Overview of Indian Financial System	1-1 to 1-31
1.1 Introduction to Financial System	1-2
1.1.1 Features/Characteristics of Financial System.....	1-2
1.1.2 Function and Role of the Financial System.....	1-3
1.2 Components of the Financial System.....	1-3
1.2.1 Financial Markets.....	1-4
1.2.2 Financial Instruments.....	1-4
1.2.3 Financial Institutions.....	1-5
1.3 Financial Markets.....	1-5
1.3.1 Characteristics and Role of the Financial Market.....	1-5
1.3.2 Difference between Money Market and Capital Market.....	1-6
1.4 Money Market.....	1-6
1.4.1 Characteristics and Role of the Money Market.....	1-7
1.4.2 Money Market Instruments.....	1-7
1.5 Capital Market.....	1-10
1.5.1 Functions, Role and Importance of Capital Market in India.....	1-11
1.5.2 Capital Market Classification	1-11
1.5.3 Industrial Securities Market.....	1-11
1.5.4 Primary Market	1-12
1.5.4(A) Characteristics and Role of Primary Market	1-12
1.5.4(B) Methods of Raising Funds in the Primary Market	1-12
1.5.4(C) Procedure of Raising Funds by Way of IPO	1-13
1.5.4(D) Financial Intermediaries involved in the IPO Process	1-16
1.5.5 Secondary Market/Stock Exchange.....	1-16
1.5.5(A) Characteristics of Stock Exchange.....	1-17
1.5.5(B) Role and Functions of Stock Exchanges.....	1-17
1.5.6 Government Securities Market.....	1-17
1.5.7 Long-term Loans Market	1-18



1.5.7(A) Term Loan Market	1-19
1.5.7(B) Mortgage Market	1-19
1.6 Foreign Exchange Market/Forex Market	1-19
1.6.1 Organization of Foreign Exchange Market.....	1-19
1.6.2 Terminologies used in Foreign Exchange Market.....	1-19
1.7 Financial Instruments	1-20
1.7.1 Money Market Instruments.....	1-20
1.7.2 Capital Market Instruments	1-21
1.7.2(A) Equity Shares.....	1-21
1.7.2(B) Preference Shares	1-21
1.7.2(C) Bonds and Debentures.....	1-22
1.7.2(D) Derivatives.....	1-22
1.8 Financial Institutions.....	1-23
1.8.1 Role and Function of Financial Institutions.....	1-23
1.8.2 Classification of Financial Institutions.....	1-23
1.8.3 Banking Institutions.....	1-24
1.8.3(A) Commercial Banking.....	1-25
1.8.3(B) Functions and Role of Commercial Banks	1-25
1.8.4 Types of Commercial Banks	1-26
1.8.4(A) Public Sector Banks	1-26
1.8.4(B) Private Sector Banks	1-26
1.8.4(C) Foreign Banks	1-26
1.8.4(D) Regional Rural Banks (RRB)	1-27
1.8.5 Cooperative Banks	1-27
1.8.6 Other Banks	1-27
1.9 Non-Banking Finance Institutions	1-28
1.9.1 Merchant Banks	1-28
1.9.1(A) Role and Function of Merchant Bank	1-29
1.9.1(B) Role of Merchant Banker is Public Issue	1-30
1.9.1(C) Categories of Merchant Bankers	1-30
1.9.2 Stock Exchanges	1-30



Module 2

Chapter 2 : Return and Risk 2-1 to 2-16

2.1	Concepts of Return and Risk.....	2-1
2.1.1	Historical Returns - Return on Asset of a Single Security Portfolio.....	2-1
2.1.2	Average Rate of Return.....	2-3
2.1.3	Holding Period Return.....	2-4
2.1.4	Measures of Risk for One Security.....	2-4
2.1.5	Expected Returns of Single Security.....	2-6
2.1.6	Expected Risk of Single Security.....	2-7
2.1.7	Use of Standard Deviation and Normal Distribution.....	2-7
2.1.8	Two Security Portfolio.....	2-9
2.1.8(A)	Returns in Two Security Portfolio - Historical.....	2-9
2.1.8(B)	Expected Return of Two Security Portfolio.....	2-10
2.1.9	Measuring Portfolio Risk for Two Security Portfolio.....	2-11
2.1.10	Diversification and Reduction of Risk.....	2-12
2.1.11	Solved Examples.....	2-13

Chapter 3 : Time Value of Money 3-1 to 3-20

3.1	Concept of Time Value of Money	3-1
3.1.1	Future Value.....	3-2
3.1.2	Simple Interest and Concept of Compounding.....	3-2
3.1.3	Rate of Return.....	3-3
3.1.4	One-time Investing/Lump Sum Investing.....	3-4
3.1.5	Future Value of Annuity (Ordinary Annuity).....	3-6
3.1.6	Sinking Fund	3-9
3.1.7	Annuity Due	3-10
3.1.8	Present Value of Money.....	3-10
3.1.9	Present Value of Annuity (Ordinary Annuity).....	3-13
3.1.10	Present Value of Annuity Due.....	3-15
3.1.11	Multi Period Compounding /Compounding for more than once a Year.....	3-16
3.1.12	Continuous Compounding.....	3-17
3.1.13	Present Value Using Continuous Discounting.....	3-17
3.1.14	Solved Examples (Refer to Future and Present Value Tables).....	3-19

Module 3

Chapter 4 : Financial Management	4-1 to 4-27
4.1 Introduction to Financial Management.....	4-1
4.1.1 Financial Management Decisions.....	4-2
4.1.1(A) Investment Decisions.....	4-2
4.1.1(B) Financing Decisions.....	4-3
4.1.1(C) Dividend Decisions.....	4-3
4.1.2 Objective of Corporate Finance.....	4-4
4.1.2(A) Shareholders' Wealth Maximization.....	4-5
4.1.3 Agency Problems.....	4-5
4.1.4 Organization of Finance Function.....	4-6
4.2 Financial Statements	4-7
4.2.1 Balance Sheet.....	4-7
4.2.2 Profit & Loss Account.....	4-10
4.2.3 Cash Flow Statement.....	4-11
4.3 Financial Ratio Analysis.....	4-13
4.3.1 Liquidity Ratios.....	4-13
4.3.1(A) Current Ratio.....	4-14
4.3.1(B) Quick Ratio.....	4-14
4.3.2 Efficiency or Activity Ratios.....	4-16
4.3.2(A) Inventory Turnover.....	4-16
4.3.2(B) Debtors Turnover.....	4-17
4.3.2(C) Ageing Schedule.....	4-18
4.3.2(D) Asset Turnover Ratio.....	4-18
4.3.3 Profitability Ratio.....	4-19
4.3.3(A) Gross Profit Margin	4-19
4.3.3(B) Operating Profit Margin	4-19
4.3.3(C) PBDIT/EBITDA Margin	4-19
4.3.3(D) Net Profit Margin	4-20
4.3.4 Capital Structure Ratios	4-20
4.3.4(A) Debt-equity Ratio	4-21
4.3.4(B) Total Debt Ratio	4-21



4.3.5	Return Ratios.....	4-21
4.3.5(A)	Return on Equity (ROE)	4-21
4.3.5(B)	Return on Investment (ROI)	4-21
4.3.6	Stock Market Ratios (Valuation Ratios).....	4-22
4.3.6(A)	Price to Earnings Ratio (P/E Ratio).....	4-22
4.3.6(B)	Price to Book Ratio (P/B Ratio).....	4-22
4.3.6(C)	Priceto Sales (P/S Ratio).....	4-22
4.3.7	Use of Ratio Analysis.....	4-23
4.3.8	Limitations of Ratio Analysis.....	4-24
4.3.9	Solved Examples.....	4-25

Module 4

Chapter 5 : Capital Budgeting		5-1 to 5-15
5.1	Capital Budgeting Decisions.....	5-1
5.1.1	Importance of Capital Budgeting.....	5-2
5.1.2	Types of Investment Projects.....	5-2
5.2	Investment Appraisal - Capital Budgeting Techniques.....	5-3
5.2.1	Accounting Rate of Return (ARR).....	5-3
5.2.2	Payback Period.....	5-5
5.2.3	Discounted Payback Period.....	5-6
5.2.4	Net Present Value Method (NPV).....	5-7
5.2.5	Internal Rate of Return (IRR).....	5-8
5.2.6	NPV Profile.....	5-9
5.2.7	Modified Internal Rate of Return (MIRR).....	5-10
5.2.8	Profitability Index (PI).....	5-11
5.2.9	Capital Rationing.....	5-12
5.2.10	Project Monitoring and Audit.....	5-13
5.2.10(A)	Solved Example	5-13

Chapter 6 : Working Capital Management		6-1 to 6-33
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6.1	Introduction to Working Capital Management.....	6-1
6.1.1	Concept of Gross Working Capital and Net Working Capital	6-2
6.1.2	Operating Cycle	6-2



6.1.3	Importance of Working Capital Management	6-3
6.1.4	Permanent and Variable Working Capital.....	6-4
6.1.5	Factors Affecting Working Capital Needs.....	6-4
6.1.6	Issues in Working Capital Management.....	6-6
6.1.7	Estimation of Working Capital Requirement.....	6-7
6.2	Management of Inventories	6-9
6.2.1	Inventory Management Techniques	6-10
6.2.1(A)	Economic Order Quantity (ECQ) (How much to Order?).....	6-10
6.2.1(B)	Reorder Point (When to Order?).....	6-12
6.2.1(C)	Safety Stock	6-12
6.2.2	Inventory Control Systems	6-13
6.2.2(A)	ABC Method of Inventory Control	6-13
6.2.2(B)	Just in Time (JIT)	6-14
6.3	Management of Receivables	6-15
6.3.1	Credit Policy	6-16
6.3.1(A)	Credit Standards	6-16
6.3.1(B)	Credit Terms	6-16
6.3.1(C)	Collection Policy and Efforts	6-17
6.3.2	Trade-off	6-18
6.3.3	Evaluation of Individual Account for Credit	6-20
6.3.3(A)	Credit Information	6-20
6.3.3(B)	Credit Analysis	6-20
6.3.3(C)	Credit Decision and Credit Limit	6-21
6.3.4	Monitoring of Receivables	6-21
6.3.4(A)	Average Collection Period (ACP)	6-21
6.3.4(B)	Aging Schedule	6-21
6.3.4(C)	Collection Experience Matrix	6-22
6.3.4(D)	Credit Utilization Report	6-23
6.3.5	Sale of Receivables/Factoring	6-23

6.4	Management of Cash and Marketable Securities.....	6-24
6.4.1	Motives for Holding Cash.....	6-24
6.4.2	Cash Management Process.....	6-25
6.4.2(A)	Forecasting Cash Flows.....	6-25
6.4.2(B)	Managing Cash Collections and Disbursements.....	6-27
6.4.2(C)	Investment in Marketable Securities.....	6-28
6.4.3	Cash Balances to Maintain.....	6-29
6.4.3(A)	Determining Optimal Cash Balance under Conditions of Certainty - William Baumol's Cash Model.....	6-30
6.4.3(B)	Determining Optimal Cash Balance Under Conditions of Uncertainty - Miller-Orr's Cash Model.....	6-31

Module 5

Chapter 7 : Sources of Finance and Capital Structure	7-1 to 7-25	
7.1	Introduction to Sources of Finance.....	7-1
7.2	Long Term Sources of Financing.....	7-2
7.2.1	Equity	7-2
7.2.1(A)	Salient Features of Equity Shares.....	7-3
7.2.1(B)	Means of Raising Equity.....	7-5
7.2.2	Debt.....	7-6
7.2.2(A)	Debentures	7-6
7.2.2(B)	Term Loans.....	7-7
7.2.3	Hybrid Financing	7-7
7.2.3(A)	Preference Shares	7-8
7.2.3(B)	Convertible Debentures	7-8
7.2.3(C)	Warrants.....	7-9
7.2.4	Mezzanine Finance	7-10
7.3	Sources of Short-term Financing	7-10
7.3.1	Trade Credit	7-11
7.3.2	Bank Finance	7-12



7.3.2(A) Cash Credit	7-12
7.3.2(B) Overdraft	7-13
7.3.2(C) Bill Discounting	7-13
7.3.3 Commercial Paper (CPs)	7-13
7.4 Project Finance	7-14
7.5 Capital Structure	7-17
7.5.1 Factors Affecting Capital Structure of the Company	7-17
7.5.2 Capital Structure Theories	7-18
7.5.2(A) Net Income Approach	7-18
7.5.2(B) Net Operating Income (NOI)	7-20
7.5.2(C) Traditional Approach	7-21
7.5.2(D) Modigliani - Miller Approach to Capital Structure	7-22
7.5.3 Elements of Capital Structure	7-22
7.5.4 Optimum Capital Structure	7-23

Module 6**Chapter 8 : Dividend Policy****8-1 to 8-9**

8.1 Introduction to Dividend Policy	8-1
8.1.1 Types of Dividend Policy	8-2
8.1.2 Factors Affecting Dividend Decision	8-2
8.1.3 Dividend Policy Theories	8-3
8.1.4 Dividend Discount Models (DDM)	8-4
8.1.5 Walter's Model	8-4
8.1.6 Gordon's Model	8-4
8.1.7 Dividend irrelevance - Modigliani - Miller approach (MM)	8-6
	8-8



Overview of Indian Financial System

Syllabus

Overview of Indian Financial System : Characteristics, Components and Functions of Financial System.

Financial Instruments : Meaning, Characteristics and Classification of Basic Financial Instruments - Equity Shares, Preference Shares, Bonds-Debentures, Certificates of Deposit, and Treasury Bills.

Financial Markets : Meaning, Characteristics and Classification of Financial Markets - Capital Market, Money Market and Foreign Currency Market.

Financial Institutions : Meaning, Characteristics and Classification of Financial Institutions - Commercial Banks, Investment-Merchant Banks and Stock Exchanges.

We have read stories about the global financial crisis of 2008 that almost brought banks, stock markets, regulators, governments, international financial institutions all on their knees. Banks started to lose confidence to provide loans and it threatened to halt the economic activity.

Crisis in one country impacted the whole world and it required a coordinated response of all the governments and central banks to bring back economy on track, while some countries in Western Europe are still struggling to come out. It is important to understand what a financial system is all about and what are their constituents. Upon successful completion of this chapter, you will understand following

Learning Objectives

- Financial system, role and functions and components.
- Financial Markets, role and importance of the financial markets, categories of financial markets i.e. money market, capital market, foreign exchange.
- Financial Institutions, commercial banks, merchant banks, stock exchanges.
- Financial instruments, types of financial instruments and advantages.



1.1 Introduction to Financial System

- Every economic activity starting from purchase of any goods or service to construction of large infrastructure projects such as airports, highways require funds and involves flow of funds. The financial system of a country, also called as the financial sector, is a system responsible for transfer and supply of funds in an economy.
- The financial system comprises of many constituents such as banks, stock markets, regulators, merchant bankers etc. The financial system can be defined as an ecosystem consisting of financial institutions, instruments and markets to facilitate the savings and transfer of funds.
- Financial system provides an ecosystem which enables the availability of funds, movement of funds and repayment of funds. It facilitates efficient transfer of money from areas of the economy having surplus to the areas having deficit and provides funds for investment.
- When we deposit our surplus funds or savings with the bank, the bank pools savings of many such depositors and lends it onwards to businesses or other household borrowers. The bank also gives interest to the depositors for depositing the money and charges interest from the borrowers for the use of money.
- A country with well-developed financial system also invariably has strong and stable economy. The success of financial system for the benefit of overall economy can be gauged by study of multiple parameters such as the depth of financial system, accessibility of the financial system to the people, efficiency of the system and stability.
- In India traditionally the penetration and reach of the financial system has been limited due to various factors such as inadequate infrastructure, illiteracy, lower income levels etc. In the recent past, access to financial system has improved significantly driven by increase in penetration of internet, rollout of Aadhar, adoption of technology by financial institutions, demonetization etc.

1.1.1 Features/Characteristics of Financial System

- Financial system acts as linkage between savers and borrowers.
- It consists of financial institutions or intermediaries, financial markets, financial instruments and involves financial transactions.
- It is applicable at firm level, regional level, national level and international level.
- It encourages savings and investment in the economy.



1.1.2 Function and Role of the Financial System

Financial system of a country provides an efficient mechanism for channelizing savings for creation of assets and plays a critical role in economic development of the country by performing following functions.

- **Liquidity function** : Financial system facilitates conversion of monetary assets fixed deposits, shares, debentures etc. into money minimizing loss of value and in the process provides liquidity. For example, stock market offers platform to sell shares of company, banks allow easy redemption of fixed deposits.
- **Savings function** : Financial system encourages savings in the economy by providing regulated mechanism for deployment of surplus funds. For example, when a depositor parks funds with banks they earn interest income, thus encouraging more savings.
- **Capital formation** : Financial system acts as intermediary and provides funding for investment in new projects, new products, expansion etc. thereby leading to formation of capital, which is essential for sustainable economic growth.
- **Payment function** : The financial system offers convenient, reliable and cost effective mode of payment for goods and services. Electronic fund transfer, cheque system, credit cards etc. are some of the commonly used payment options.
- **Risk function** : Financial system is constantly evolving and has built in checks and balances for carrying out various financial transactions and helps in improving safety of the investment. The financial system also provides options to insure risk against life, property, frauds, burglary etc.
- **Lower cost of transaction** : Financial system enables transactions at low cost thus encouraging more transactions and economic growth.

1.2 Components of the Financial System

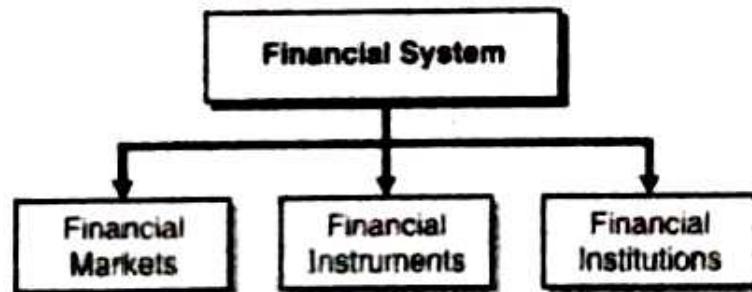


Fig. 1.2.1

Financial system has three major components. These are financial markets (capital market, money market etc.), financial instruments (shares, debentures etc.) and financial institutions (banks, stock exchange etc.). In the following paragraphs these components are explained in more details.



1.2.1 Financial Markets

Financial market is the market for creation and exchange of financial assets like shares, debentures, bonds, treasury bills, commercial papers, foreign currency etc. It is not a physical market but refers to the arrangement for dealing into financial assets. The financial markets can be classified into 3 major markets depending on the types of financial instruments that are traded i.e. Money market, Capital market and Foreign exchange market.

- (a) **Money market** : It deals with short term debt securities (in the nature of loans) having a maturity of less than 1 year. Money market has organized and unorganized components. Money market is used by investors for investment of excess funds available for short term and by borrowers for meeting their short-term funding requirements. Organized money market is mainly dominated by banks. Other participants in the money market includes corporates, insurance companies, mutual funds etc. Unorganized money market is operated by the likes of moneylenders.
- (b) **Capital market** : It deals with securities such as shares, bonds etc. having a maturity of more than 1 year. This market is further divided into primary market and secondary market. Primary market deals with new financial instruments such as equity shares, preference shares, bonds etc. Secondary market or stock exchanges provide a platform for dealing into previously issued securities such as shares, bonds etc. Participants in these markets are foreign institutions, mutual funds, insurance companies, corporates, individuals, brokers, merchant bankers etc.
- (c) **Foreign exchange market or Forex market** : It deals with the transaction in currencies of different countries. As most international transactions involve exchange of one currency to another, the foreign exchange market is the largest market globally by transaction value. Participants into this markets are commercial banks, corporates, brokers etc.

1.2.2 Financial Instruments

Financial instruments are the financial products through which corporates and institutions raise funds. Financial instruments can be broadly classified into two types; Short term and Long term.

- (a) **Short term or money market instruments** : These instruments have a maturity of less than 1 year such as commercial paper, treasury bills, certificate of deposits and form part of money market. The details of these instruments are covered in money market discussion.
- (b) **Long term instruments** : These instruments have a maturity of more than 1 year. Examples of long term instruments are bonds, preference shares, equity shares and may or may not have a fixed maturity such as shares etc.

1.2.3 Financial Institutions

Financial institutions act as intermediaries between the savers and users of funds. Commercial banks, investment banks, financing companies etc. fall in the category of financial institutions. Financial institutions are classified into categories of banking and non-banking institutions.

(a) Banking institutions : It includes public sector banks, private banks, foreign banks, regional rural banks, cooperative banks, payment banks, small finance banks etc. and provide banking services. State Bank of India, HDFC Bank, ICICI Bank, SVC Cooperative Bank is some of the examples of banking institutions. These are regulated by India's Central bank, the Reserve Bank of India also called as RBI.

(b) Non-banking institutions : It includes non-banking financial institutions engaged in providing services such as housing finance, consumer finance, vehicle financing, stock broking, merchant banking, mutual funds, development financing companies etc. Depending on the activity non-banking institutions are regulated by banking regulator RBI, capital markets regulator SEBI, insurance regulator IRDA etc.

1.3 Financial Markets

In the above section, we understood the concept of financial market. We will discuss in more detail in below paragraphs.

1.3.1 Characteristics and Role of the Financial Market

- Facilitating price discovery :** Financial market provides accurate and timely information on the price of the financial assets to the buyers and sellers.
- Provide liquidity to financial asset :** Financial markets provide highly efficient and liquid platform for sale and purchase the financial assets ensuring minimum loss in value of asset upon conversion into cash.
- Reducing the cost of transactions :** Financial markets facilitate sale and purchase of securities at low transaction cost.
- Mobilization of savings :** Financial markets bring together the savers and businesses together and in the process provides avenues to invest the savings. It provides a regulated platform for investment.
- Allocation of savings in productive sectors :** As markets provide information of returns and performance of various securities, sectors etc., investors can take informed decisions on investment in various sectors/securities. This it provides mechanism for allocation savings into most productive sectors.



1.3.2 Difference between Money Market and Capital Market

Sr. No.	Money Market	Capital Market
1.	This is a market for short term instruments.	This is a market for long term instruments.
2.	Money market is used to meet short term requirements of corporations, banks and Government.	Capital market is used for long term funding requirements.
3.	Bill of exchange, Treasury bills, Commercial papers etc. are some of common instruments that are dealt in this market.	Equity shares, Preference shares, Debentures, Government securities etc. are the instruments that are dealt in this market.
4.	Commercial banks are the largest participants in this market.	Mutual funds, Foreign institutional investors, insurance companies are the major participants in this market.
5.	Secondary market is not as large as primary market due to short term nature of instruments.	Secondary market is much larger than primary market.
6.	Transactions are generally done through telephone or mails.	Transactions are generally done through stock exchange.

1.4 Money Market

Money market is a market for dealing (sale and purchase) in short term securities which have a maturity period of upto one year. This market is used by investors to park their surplus funds for short term basis. Due to large ticket size of transactions, money market is typically dominated by institutions such as Banks, Insurance companies etc., however individuals can also invest funds in the money market through mutual funds.

Money market in India is regulated by the country's central bank i.e. Reserve Bank of India (RBI). RBI also participates in the market from time to time to manage liquidity in the system and raise funds for the Government of India.

1.4.1 Characteristics and Role of the Money Market

Characteristics and Role of the money market is as follows:

- Money market deals in highly liquid short-term debt securities of maturity between 1 day to one year.
- Money market caters to the working capital and short-term requirements of firms and the governments, banks and financial institutions.
- The money market fulfils the borrowing and investment requirements of providers and users of short-term funds and balances the demand for and supply of short-term funds.
- Money market offers a higher degree of safety, compared to other markets.
- Rate of return or interest rate on the investment is comparatively lower than other financial markets due to shorter maturity.
- It serves as a one of the preferred markets for the Reserve Bank of India's (RBI's) intervention in the market to manage money flow in the system and short-term interest rates.
- Generally, transactions take place through oral communication (for e.g. phone or mobile) in the money market. The exchange of relevant documents and written communications take place subsequently. There is no formal place for the trading (like a stock exchange).
- Participants in the money market are RBI, Commercial Banks, Non-banking financial companies, Mutual Funds, Corporate bodies etc. Commercial banks are the most dominant participants of this market.

1.4.2 Money Market Instruments

1. Call market (call money)

- 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.

- 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.

2. Treasury bills

- 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.

1.5 Capital Market

- Capital market is a market where buyers and sellers engage in creation and trade of financial securities having a maturity of more than 1 year. Trading of the securities generally take place on screen.
- Capital market provides platform for trading of debt as well as equity securities.
- Capital market consists of primary market and secondary market. Primary market deals with issuance of new securities, whereas secondary market provides platform for dealing of previously-issued securities.
- Primary market provides new capital while secondary market provides necessary liquidity for the sale and purchase of previously issued securities. Existing holders of securities can sell their holdings in the secondary market, thus freeing up funds for investment in primary market issues. Thus, a well-functioning secondary market is key to development of primary market.
- Major investors in the capital market are insurance companies, foreign portfolio investors, mutual funds, commercial banks, non-banking financial institutions, provident fund, pension funds.



1.5.1 Functions, Role and Importance of Capital Market in India

1. Mobilization of savings for financing long term investment.
2. Provide liquidity by enabling sale of securities without any loss of value.
3. Provide long term risk capital to entrepreneurs.
4. Allocation of capital to productive sectors of the economy as capital market transfers savings to well-functioning companies.
5. Capital Markets provide funds for projects in backward areas through competitive pricing mechanism facilitating development economic development of backward areas.
6. Capital markets make it possible for companies to attract foreign capital by issuance of bonds, shares etc.
7. Provide insurance against market risk using derivative instruments.
8. Capital market serves as a reliable guide to the performance and financial position of corporate, and thereby promotes efficiency.

1.5.2 Capital Market Classification

Based on the type of securities that are traded, capital market is divided into Industrial securities market and Government securities market. However, primary classification capital market is still between primary and second markets.

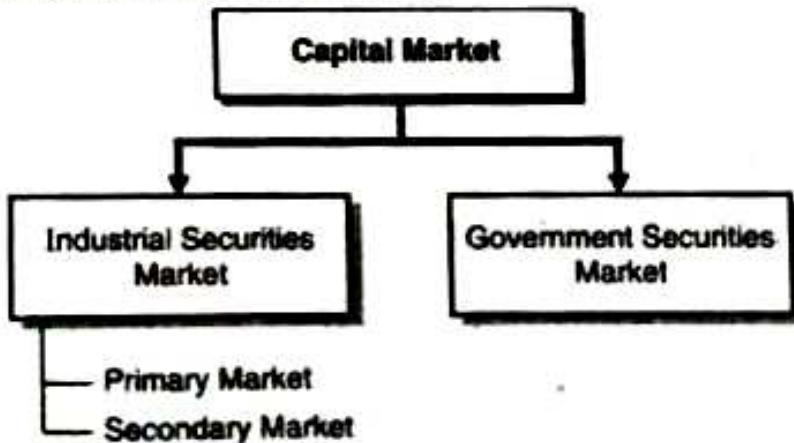


Fig. 1.5.1

1.5.3 Industrial Securities Market

Industrial securities market is the market for dealing in shares and bonds of existing and new companies. This market is further divided into primary and secondary market which are discussed below in detail.

1.5.4 Primary Market

- The primary market is a market where issuance of new securities take place and is also called new issue market. It deals with the new securities which were not previously available for investment. Corporate enterprises and Government can raise long term funds from the primary market by issuing long term securities. These securities may be in the form of equity shares, preference shares, debentures, right issues, deposits etc.
- Both new and the existing companies can issue new securities in the primary market. In the primary market, new issues of equity and debt are arranged in the form of Initial Public Offering (IPO or via private placement or in the form of rights issue to existing shareholders.

1.5.4(A) Characteristics and Role of Primary Market

- It is a market for the fresh issue of shares, debentures, etc.
- It helps companies to raise capital and long-term loans.
- It includes various financial institutions that support the fresh issue of securities.
- It enables formation of capital by channelizing the savings of the public.
- It provides risk and non-risk capital to companies that encourages setting up and expansion of new business and creation of jobs.

1.5.4(B) Methods of Raising Funds in the Primary Market

1. Public Issues

Under this method company raises funds from general public, by issuing a prospectus. Securities issued by this method are generally listed on stock exchanges and available for sale and purchase on exchanges. The prospectus contains information about the company such as the purpose for which funds are being raised, past financial performance of the company, background, future plans, risks, growth prospects of company etc. This information helps the prospective investors to take decision regarding investment. Public issues can be of following types

- (a) **Initial Public Offering (IPO)** : This is an offering by an unlisted company for the first time in its life to the general public. It contains either a fresh issue of securities or an offer for sale of existing securities or both.
- (b) **Follow-on Public Offering (FPO)** : This is an offer for sale of securities by an already listed company through an offer document to the general public. It can either be a fresh issue of securities or an offer for sale of existing securities.



2. Offer for Sale

Under this method securities are not issued directly to the public but are offered for sale through intermediaries like issuing houses or stock brokers. Under this method, the sale of securities takes place in two stages. In the first stage, the issuing company sells the shares to the intermediaries such as issue houses and brokers at an agreed price. In the second stage, the intermediaries resell the securities to the ultimate investors at a market related price. This price is generally higher and the difference between the purchase price and the issue price represents profit for the intermediaries. This method is not common in India.

3. Private Placement

Private placement is the allotment of securities by a company to institutional investors and some selected individuals. It helps to raise capital more quickly than a public issue. This involves issuance of securities to less than 50 persons without issuing prospectus letter of offer and without seeking permission for listing for the securities. The issuers could be public limited companies or private limited companies. These securities may be listed or unlisted.

4. Rights Issue

This is a method of raising of funds through issuance of new shares by the company to existing shareholders. The shareholders are offered the 'right' to buy new shares in proportion to the number of shares they already possess. The existing shareholders may accept or reject the right. Shareholders who do not wish to take up the right shares can sell their rights to another person. If the shareholders neither subscribe the shares nor transfer their rights, then the company can offer the shares to public.

1.5.4(C) Procedure of Raising Funds by Way of IPO

Under public issue, the new shares/debentures may be offered either directly to the public through a prospectus (offer document) or indirectly through an offer for sale. An IPO could be structured for 2 reasons. Firstly, the company may be looking for fresh funds to finance its expansion and diversification plan. This will increase the share capital of the company.

Secondly, the company could also structure it in the form of an Offer for Sale (OFS). Here there is no addition to shares but the existing shareholders offload part of their holdings in the unlisted company through the market and get it listed in the process. Quite often it is a combination of a fresh issue and an OFS. The main steps involved in public issue are as follows:

1. Appointment of Merchant Bankers/Investment bankers

The company needs to choose merchant banker to manage the IPO. They act as intermediaries between company and investors. Merchant banker does the due diligence to prepare the offer document which contains all the details about the company.



They are also responsible for ensuring compliance with the legal formalities in the entire issue process and for marketing of the issue. Sometimes underwriters are appointed to ensure full subscription. Underwriters are responsible for subscription of the issue in case of any shortfall.

2. Registration for IPO and Filing of Draft Prospectus

- Any company making a public issue or a rights issue of securities of value more than Rs 50 lakhs is required to file a draft offer document with SEBI for its observations. The merchant banker and the company prepare a registration statement and a draft prospectus.
- The registration statement includes the detailed report of its fiscal health and business plans and is submitted to the regulator of capital markets in India the Security and Exchange Board of India (SEBI). SEBI issues its observations by way of observation letter. The validity period of SEBI's observation letter is 12 months only i.e. the company has to open its issue within the period of twelve months starting from the date of issuing the observation.
- Post submission of registration document, draft prospectus also called as 'Draft Red Herring Prospectus' is submitted to the SEBI. It includes detailed financial records, future plans and the specification of expected share price range. This prospectus is meant for prospective investors who would be interested in buying the stock.

3. SEBI Approval

SEBI verifies the facts disclosed by the company. It looks for errors, omissions, and discrepancies. Only after SEBI approves the application can the company set a date for the IPO. The company can open its issue within 3 months from the date of SEBI's approval. SEBI's approval is also called observation letter.

4. The Roadshow

- Once the prospectus is ready, underwriters and company officials go on countrywide 'roadshows', conduct investor meets and broker meets across India to sell the idea to retail, HNI investors, institutional investors.
- Additionally, companies looking at global investors also conduct road shows at key financial centers across the world like New York, Boston, London, Singapore and Hong Kong. Investors are provided with detailed information regarding company's future plans and growth potential. They get a feel of investor response through these tours.

5. Finalization of Price Band & Share Number

After the Roadshows, SEBI approval, the company, with assistance from the investment bankers and underwriters decides on the price band of the shares and also decides the number of shares to be sold. There are two types of issues: Fixed Price IPO and Book Building IPO.

1. **Fixed Price IPO :** In a Fixed price issue – the company decides the price of the share issue and the number of shares being sold.

Ex. : XYZ Ltd public issue of 10 lakh shares of face value Rs.10/- each at a price of Rs.65/- each to the public.

2. **Book Building IPO :** In this method, Company uses book building process to discover the price of the issue. The company decides a price band and it gives the investor an option to choose the price at which he/she wishes to bid for the company shares.

Ex. : XYZ Ltd issue of 10 lakh shares of face value Rs.10/- each at a price band of Rs.60 to Rs.70/- is available to the public thereby generating upto Rs.7 Crores. Here the amount generated through the issue would depend on the highest amount bid by most investors.

6. Available to Public for Purchase

On the dates mentioned in the prospectus, the shares are available to public. Investors can fill out the IPO form and specify the price at which they wish to make the purchase and submit the application.

7. Allotment of Shares

- Once the subscription period is over, members of the underwriting banks, share issuing company etc. will meet and determine the price at which shares are to be allotted to the prospective investors.
- The price would be directly determined by the demand and the bid price quoted by investors. Once the price is finalized, shares are allotted to investors based on the bid amounts and the shares available. In case of oversubscribed issues, shares are not allotted to all applicants.
- Investors who have applied through ASBA & to whom shares were allotted would get the shares credited to their DEMAT accounts & their funds getting debited from their bank account or else for those investors to whom the shares were not allotted, funds would get unblocked in their bank account.

8. Listing

The last step is the listing in the Stock Exchanges. Finally, there is the actual listing of the stock which converts the IPO into a secondary market play. From that day, the stock can be purchased and sold on the secondary market.



1.5.4(D) Financial Intermediaries involved in the IPO Process

Financial Intermediaries involved in the IPO process are as follows:

1. **Merchant Banks** : Merchant banks act as issue managers, lead managers or co-managers. Merchant banks are responsible for compliance and marketing of the issue.
2. **Registrars to the issue** : Registrars are intermediaries who undertake all activities connected with new issue management such as allotment of shares. They are appointed by the company in consultation with the merchant bankers to the issue.
3. **Bankers** : Some commercial banks act as collecting agents and some act as co-ordinating bankers. They play an important role in transfer, transmission and safe custody of funds.
4. **Brokers** : They act as intermediaries in purchase and sale of securities in the primary and secondary markets. They have a network of sub brokers spread throughout the length and breadth of the country.
5. **Underwriters** : Generally, investment bankers also act as underwriters. They agree to take a specified number of shares or debentures offered to the public, if the issue is not fully subscribed by the public. Company needs to pay a separate fees called underwriting fees. Underwriters may be financial institutions, banks, mutual funds, brokers etc.

1.5.5 Secondary Market/Stock Exchange

- Secondary market is a market for sale and purchase of existing securities. Secondary market generally means organized stock exchanges as they provide a continuous and regular market for buying and selling of securities. In some cases, unlisted securities are traded over the phone. however it represents small portion of equity market.
- Stock exchanges in India are regulated under the Securities Contracts (Regulation) Act 1956. Under the Securities Contracts (Regulation) Act, 1956 a stock exchange is defined as "an association, organization or body of individuals, whether incorporated or not, established for the purpose of assisting, regulating and controlling business of buying, selling and dealing in securities. Securities can be listed and traded on multiple stock exchanges.
- In India, currently there are 6 stock exchange as listed by SEBI. There are BSE Ltd or Bombay Stock Exchange, National Stock Exchange of India Ltd known NSE, Calcutta Stock Exchange Ltd, India International Exchange (India INX), NSE IFSC Ltd, Metropolitan Stock Exchange of India Ltd. BSE and NSE are the two of the largest stock exchanges in India. BSE is also the oldest stock exchange in Asia and has the distinction of the largest numbers of listed companies in the world. However, National Stock Exchange or NSE is the largest stock exchange in India in terms of the daily turnover and counts as all major financial institutions as investors. INX and IFSC are based in Gandhinagar and only provide derivative services.



1.5.5(A) Characteristics of Stock Exchange

1. Stock exchange provides a continuous and regular market for buying and selling of securities.
2. Stock market allows trading of only listed securities. Each listed security has unique ticker or code provided by the exchange.
3. Stock markets provides periodic information related to trading of securities such as price, volume etc.
4. Trading in the stock market takes place through the authorised stock brokers.
5. Interest of the participants are protected through a surveillance mechanism on the trading activity capable of detecting any abnormal trading activity.
6. Stock exchange are considered as an indicator of the current and future of the economic activities of the country.

1.5.5(B) Role and Functions of Stock Exchanges

1. Stock exchanges provide liquidity through a continuous and ready market.
2. Stock exchanges ensure mechanism for safe and uninterrupted trading and transfer of securities.
3. Stock exchange encourage long term savings in the economy by providing a liquid, accessible and long term securities market.
4. Stock exchanges provide mechanism for new capital formation as for existing holders can easily sell their securities and can participate in new public issues.
5. Stock exchanges enable allocation of funds from unproductive sectors of the economy to productive sectors.
6. Entrepreneurs or existing businesses can use stock exchange information as an important parameter for deciding investments in new businesses.
7. Publicly listed companies on stock exchanges have an added advantage of creating larger brand awareness as multiple investors trade on stock exchanges.
8. Listed companies on stock exchanges need to provide periodic updates on their financial and business performance. This also puts pressure on the management to disclose information and operate efficiently.

1.5.6 Government Securities Market

- Government securities also called as 'Gilt edged' securities market. The term 'gilt edged' means the gold edged and refers to the best quality in the context of securities. Since Government Securities have nil degree of the risk of default, so these are called gilt-edged securities. It is a market where Government securities are traded. Government issues both long term and short term securities.



- The long term securities issued by Central Government are also called G-sec are traded in this market. Short term Government securities called as treasury bills are traded in the money market.
- The G-sec market is a source of long-term funds to the Government of India and State Governments. The Government bonds are securities having a fixed date of maturity and are issued to raise medium and long-term loans in the open market. G-sec are issued by
 - Central Government
 - State Governments
 - Semi Government authorities like City Corporations, municipalities
 - Autonomous bodies such Airports, Port Trusts etc
 - State Government entities such as Transport corporations, State Electricity Boards
 - Public Sector Enterprises
 - All India and State level financial institutions etc.
- G-sec market in India for all practical purposes represents securities issued by Central Government. G-Secs are securities issued for a tenor ranging from 5 years to 40 years. These are aimed at financing the shortfalls in fiscal balances.
- G-Secs carry a coupon rate or interest rate which is paid half-yearly and are redeemed at maturity at par value on maturity date. The G-Secs issuances are managed by the RBI, which issues them on behalf of the Centre by auction method. The total auction size generally ranges between Rs. 15,000 - Rs 18,000 Cr.
- Considering such large issuance size, they are underwritten by Primary Dealers. Commercial banks, Primary Dealers, Insurance Companies, Provident Funds, Mutual Funds are the primary investors in the G-sec market. G-Secs have a very liquid and vibrant secondary market.

1.5.7 Long-term Loans Market

In addition to primary and secondary markets, sometimes long term market is also referred as a part of the capital market. Commercial banks and non-banking financial companies provide long term loans to corporate and individual customers. Long term Loans market is further classified into:

- (a) Term Loan Market
- (b) Mortgages Market
- (c) Financial Guarantees Market



1.5.7(A) Term Loan Market

Term loans are long term loans offered by financial institutions for businesses to meet their long term requirements and generally having maturity of more than 3 years. Government of India had created industrial financing institutions such as ICICI, IDBI, IFCI to provide long term loans to corporate customers. The primary objective was to provide loans for setting up and expansion of new projects. However, over the years, the role of these institutions have diminished as ICICI and IDBI has converted into a bank and commercial banks now are the main providers of long term loans.

1.5.7(B) Mortgage Market

This market consists of the institutions which supply mortgage loan. A mortgage loan is a loan against the security of immovable property like real estate. The term 'mortgage' refers to the transfer of interest in a specific immovable property to secure a loan. Many non-banking financing institutions such as HDFC, LIC Housing Finance, Tata Capital Housing and all major commercial banks such as SBI, Bank of Baroda, ICICI Bank provide mortgages to individual and non-individual customers.

1.6 Foreign Exchange Market/Forex Market

Foreign exchange market deals with the transaction in currencies of different countries. The rate at which one currency is converted into another is called as Exchange rate. Foreign exchange market provides mechanism for exchanging one currency into another.

1.6.1 Organization of Foreign Exchange Market

- The foreign exchange market is also known as forex, FX, or the currency market. It is an over-the-counter (OTC) global market that determines the exchange rate for currencies around the world.
- Participants are able to buy, sell, exchange, and speculate on currencies.
- Participants in the Foreign exchange markets are banks, forex dealers, corporates, central banks, investment management firms etc.
- It is the largest and most liquid financial market in the world.
- Foreign exchange markets are screen based and comprises of a global network of financial centres. It has no physical location and operates 24 hours a day.

1.6.2 Terminologies used in Foreign Exchange Market

Currencies are always traded in pairs, so the "value" of one of the currencies in that pair is relative to the value of the other. For example, USDINR means value of 1 USD in terms of Rupee which is currently prevailing in the range 73-75.

Establishing this relationship is the main function of the foreign exchange market. USD being a reserve currency of the world, exchange rates of other currencies are quoted relative to USD. Conversion rate of one currency into another not involving USD is called cross currency rate.

There are two main types of exchange trades; a) Spot b) Forward

- **Spot :** A spot transaction refers to exchange of currencies with a standard settlement timeframe of two days or T+2. The price of a currency at the point of exchange for a different currency in the FX market is referred to as a spot rate.
- **Forward :** In a Forward transaction, a buyer and seller agree on an exchange rate for any date in the future, and the transaction occurs on that date. This provides certainty to both the buyer and seller of the foreign currency as the exchange rates are fixed regardless of what the market rates are then. The duration of the trade can be one day, a few days, months or years.

The types of FX rates offers are called Interbank, Merchant and Card Rates depending on the market.

- The inter-bank rate entails the foreign exchange trading price between banks within the Indian forex market. The foreign exchange of currencies between banks is usually centralized by a commercial bank which conducts the trade and determines the inter-bank rates to other banks such as central banks and nationalized banks among others.
- Merchant rates, on the other hand, consist of the foreign currency prices offered to merchants of the import and export businesses within the Indian market. These merchants get their merchant rates from any of the numerous commercial banks that deal in the Indian forex market.
- Card rates are currency prices that are designed for basic and minor forex transactions such as tourism and hospitality transactions. For example, when a Foreign Tourists walk into any bank and asks for conversion of USD into Rupees, they will be offered exchange at card rates.

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

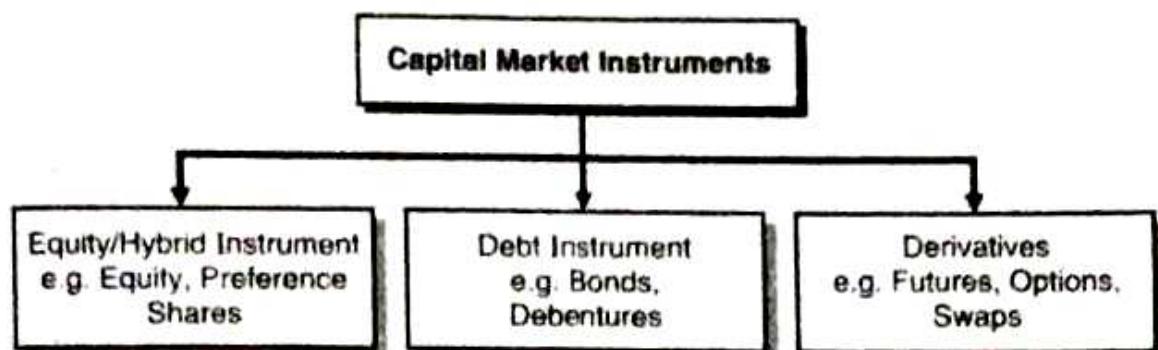


Fig. 1.7.1

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.

1.8 Financial Institutions

Financial institutions provide financial services such as deposit, fund transfer, lending, investing etc. The term "financial institutions" refers to all kinds of organizations which intermediate and facilitate financial transactions of both individual and corporate customers. Financial Institutions are integral to the financial sector of the economy. Strong financial institutions support economic growth of the country while weaker financial institutions lead to inadequate funding for the economic activities.

1.8.1 Role and Function of Financial Institutions

1. **Mobilize savings :** Financial institution provide multiple avenues for investment of surplus funds for individual and corporate function.
2. **Supply of Credit :** Financial institutions extend loans to the individual and corporate borrowers.
3. **Transfer of Funds :** They provide fund transfer services in very cost effective manner thus enabling flow of goods and services in the economy.
4. **Risk Mitigation :** Financial institutions extends credit to diversified customer base, helping to mitigate the large scale risk of default.
5. **Flow of Funds :** Financial institution due to their diversified presence ensures flow of credit to all the geographies of the country.
6. **Financial Inclusion :** Financial institutions through their widespread network facilitate financial inclusion.

1.8.2 Classification of Financial Institutions

- (a) Banking institutions
- (b) Non-banking financial institutions

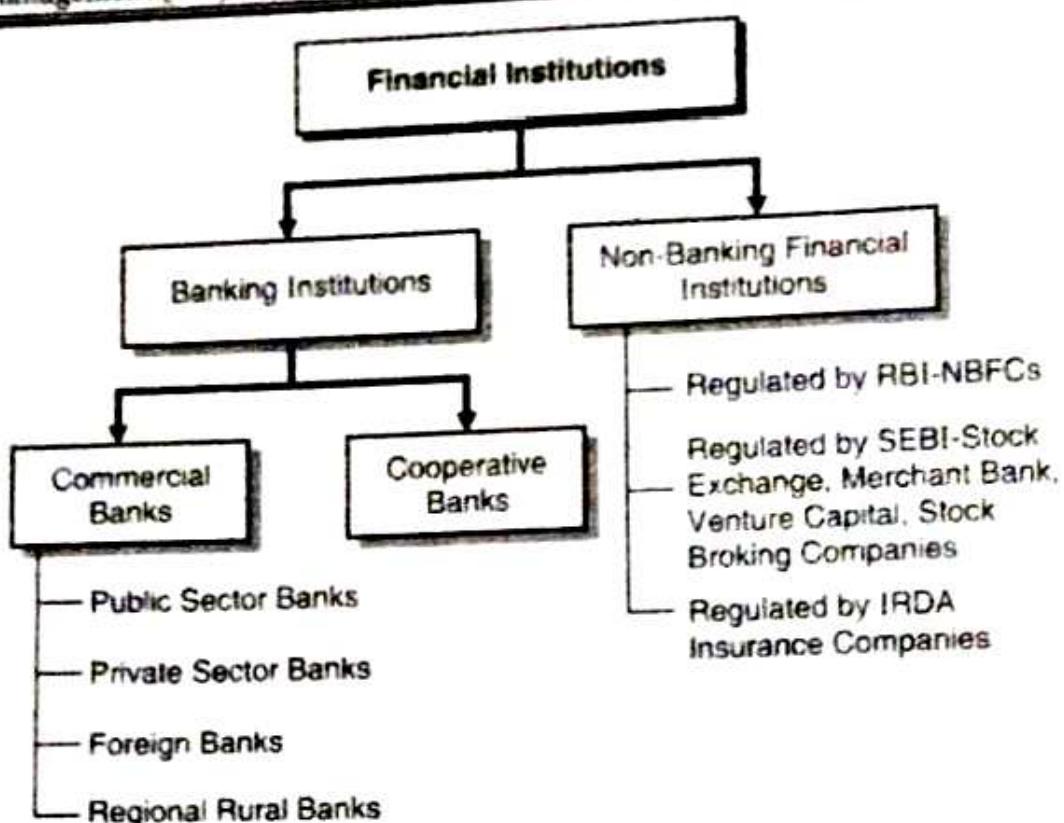


Fig. 1.8.1

1.8.3 Banking Institutions

According to the Banking Regulations Act, a banking institution is an institution that does the business of banking. The term banking business is defined as the accepting of deposits of money from the public for the purpose of lending or investment and repayable on demand. A banking institution mobilizes the savings of the public through accepting of deposits of money and lends the same to the individual and corporate customers to meet their short term, medium term and long term financial requirements and invests the surplus amount in various securities.

Central Banks : Central banks are the financial institutions responsible for monitoring and regulation of banking institutions in the country. Reserve Bank of India is India's central bank was set up in 1935 by RBI act and is head-quartered in Mumbai. Reserve Bank of India performs important functions of inflation management by setting up benchmark interest rates and controlling flow of money in the economy. Lower interest rates lead to higher inflow of money, drives up demand of goods and services and leads to higher inflation. Higher interest rates lead to higher cost of funds and hence tempers the demand and puts brakes on inflation.

Reserve Bank of India also maintains stability in the foreign exchange markets. It also acts as banker to the Government by issuing the Government securities and buying and selling of Government securities.



1.8.3(A) Commercial Banking

Commercial banks are the backbone of the Indian financial system. They accept deposits from retail and corporate customers and lend the funds to retail and corporate customers for their working capital and long term funding requirements. There are four major types of commercial banks in India i.e. (a) Public Sector banks, (b) Private Sector banks, (c) Foreign banks and (d) Regional rural banks.

1.8.3(B) Functions and Role of Commercial Banks

Primary Functions

1. **Accept deposits** : Commercial banks accept deposits from public. These deposits are in the form of savings deposits, time deposits and current deposits.

(a) **Saving deposits** : These are the deposits made to the savings accounts that a person uses to deposit and withdraw monies without any restrictions. Any person competent to contract can open a savings account and deposit funds in the account. Banks pay interest to depositors for the amounts lying in the savings account. Generally, individuals use savings bank accounts for depositing short term savings for meeting regular expenses. A savings account can also be opened in the name of duly formed club, society, provident fund and trust. Savings accounts generally have a limit on number of transactions and charges are payable for additional transactions.

(b) **Time deposits** : These are deposits for a fixed period of time and generally carry higher rate of interest than saving deposits. Typically banks offer time deposits for 7 days and more period. Banks generally put restrictions on early withdrawal of deposits by charging penalty etc.

(c) **Current account** : Current account is a type of bank account for those who want to make large number of transactions on a regular basis. Unlike savings account there is generally no transaction limit. Deposits made in these accounts i.e. current deposits do not earn any interest. These are used by professional, businesses entities for managing day to day cash flow.

2. **Making loans and advances** : Commercial banks provide loans and advances for short term and long term fund requirements to individuals and non-individuals for various needs.
3. **Transfer of funds** : Banks form part of payment and settlement system in the country and enable transfer of funds from one person to another.

Secondary Functions

1. **Overdraft facility** : It is an advance given to a customer by keeping the current account to overdraw up to the given limit.



2. **Discounting bills of exchange** : Bill of exchange is a commercial bill acknowledging the amount of money to be paid at a later date in future against the goods purchased. Banks provide facility of early payment to the seller by discounting the bill of exchange.
3. **Utility services** : Collection of taxes, filing of tax returns, bill payment, tax consultancy etc.
4. **Foreign exchange services** : Banks provide foreign currency exchange services to the customers by buying and selling foreign currencies.
5. **Purchasing and selling of the securities** : It offers services of selling and buying the securities.
6. **Locker facilities** : Bank provides lockers facility to the customers for safe keeping of valuable items, documents etc.

1.8.4 Types of Commercial Banks

Commercial banks are classified into public sector banks, private sector banks, foreign banks, and regional rural banks.

1.8.4(A) Public Sector Banks

- Public sector banks are the banks that are majority (more than 50%) owned by Government of India. As of April 2020, India had 12 public sector banks, largest of them is State bank of India also called as SBI. Other large public sector banks are Punjab National Bank, Bank of Baroda, Canara Bank, Bank of India, Union Bank of India, Central Bank of India etc. Public sector banks dominate share of public deposits and loans, however it has down rapidly in recent years.
- The public sector banks came into existence, when Reserve Bank of India acquired 60% stake in erstwhile Imperial Bank of India and renamed it as State Bank of India. Further nationalization took place when in a major decision, Government of India nationalized 14 major private banks in 1969 and 6 more in 1980 to increase penetration of banking in India.

1.8.4(B) Private Sector Banks

These include banks in which major shareholding is held by private shareholders. In India at present there are 22 private sector banks. HDFC Bank, ICICI Bank, Kotak Bank, IndusInd bank, Yes Bank, Federal Bank are among the largest private sector banks in India. IDBI Bank also classified as private sector bank; however, Life Insurance Corporation of India (LIC of India) holds majority stake in IDBI Bank. LIC is at present 100% owned by the Government of India.

1.8.4(C) Foreign Banks

These are the banks that need to follow regulations in their home country as well as in the country of operations. In India, currently there are 46 foreign banks operating in India through branches are wholly owned subsidiaries as on May 31, 2020.

However, they have limited presence and each bank only operate through few branches. Standard Chartered, Citibank, HSBC are among the largest foreign banks operating in India.

1.8.4(D) Regional Rural Banks (RRB)

Regional rural banks are scheduled commercial banks operating at regional level in different states. They are established to provide credit (loans) to weaker sections of the society. They provide banking to rural and semi-urban areas. The RRBs have 3 shareholders i.e. central government of India, sponsor bank and state government in the ratio of 50:35:15 respectively. Sponsor bank can be any commercial banks; however currently only public sector banks are the sponsor banks. Currently there are about 43 functioning RRBs in India. Examples of RRBs operating in Maharashtra are Vidarbha Konkan Gramin Bank and Maharashtra Gramin Bank and are sponsored by Bank of India and Bank of Maharashtra respectively.

1.8.5 Cooperative Banks

- These banks are established on the cooperative basis and owned by its members. They are registered under Cooperative Societies Act, 1912 and are run by a managing committee, elected by the members. They were established with the objective of promoting savings and proving credit in the rural areas.
- Cooperative banks are further divided into urban cooperative banks and state co-operative banks. Urban co-operative bank refer to the cooperative banks located in urban and semi-urban areas. The primary customer base of these banks are small businessmen, a group of communities etc. State co-operative banks act as custodian of the cooperating banking the state. Currently there are about 1482 urban cooperative banks and 58 state cooperative banks in the country.
- Cooperative banks were traditionally under the dual control of cooperative societies as well as RBI. Cooperative society overlooked incorporation, registration, management, audit, supersession of board of directors and liquidation. RBI was responsible for regulatory functions. Cooperative banking sector has been traditionally plagued with number of frauds. Recently Government of India brought cooperative banks under the RBI supervision to improve the functioning of cooperative banks and safeguard the deposits in the cooperative banks.

1.8.6 Other Banks

- In addition to the commercial and cooperating banking, RBI has in recent past granted licenses to small finance banks and payment banks. Small finance banks play role in serving under banked sections of society to improve the financial inclusion in the country.



- Au Small Finance Bank, Ujjivan Small Finance Bank are some of the example of small finance banks. Payment banks are allowed to accept restricted deposits, currently upto Rs. 1 Lakh per customer and offer services like fund transfer via net banking, mobile banking, debit cards etc. There are currently only handful payment banks in the country. Paytm Payment bank, India Post Payment Bank are examples of payment banks.
- Banks can also be classified on the basis of Scheduled and Non-Scheduled Banks. Scheduled banks are covered under the 2nd Schedule of the Reserve Bank of India Act, 1934. Most of the banks India are scheduled commercial banks.
- Scheduled Banks are covered under the depositor insurance program of Deposit Insurance and Credit Guarantee Corporation (DICGC), which is beneficial for all the account holders holding a savings and fixed / recurring deposit account. Under DICGC, bank deposits of up to Rs 5 lakh are insured.

1.9 Non-Banking Finance Institutions

- Non-banking institutions do not hold banking license, however, facilitate finance related services.
- RBI defines non-banking finance company as a company registered under the Companies Act, 1956 engaged in the business of loans and advances, acquisition of shares/stocks/bonds/debentures/securities issued by Government or local authority or other marketable securities of a like nature, leasing, hire-purchase, insurance.
- NBFCs are regulated by different regulators depending on the type activities carried. These include a) Non-banking finance companies or NBFCs (e.g. Sundaram Finance, Tata Capital) regulated by RBI b) Insurance Companies (e.g. LIC, New India, HDFC Life) regulated by insurance regulator IRDA c) entities regulated by SEBI such as Mutual Funds (SBI Mutual Fund, ICICI Prudential Mutual Fund), Merchant Banks (e.g. Axis Capital, Kotak Mahindra), Venture Capital Funds, Stock Exchanges etc, d) housing finance companies (e.g. Indiabulls Housing Finance, Magma Home Finance) regulated by National Housing Bank or NHB.
- For the scope of this book, we will study Merchant banks and stock exchanges in more detail and also understand briefly about NBFCs regulated by the RBI.

1.9.1 Merchant Banks

- The name merchant bank is derived from the banking services provided in medieval times by the merchants in Europe for financing of commodities. Today merchant banks offer much broader range of services and more popularly known as Investment banks.



- Merchant Banker in India is defined as, any person who is engaged in the business of issue management either by making arrangements regarding selling, buying, or subscribing to the securities as manager, consultant, adviser in relation to such an issue management.
- Merchant Banks are the financial institutions which provide a wide range of financial services such as issue management, financial advisory, portfolio management, consulting services to large corporate houses or individuals.
- *Goldman Sachs, Morgan Stanley, Credit Suisse, CLSA* are some of the well-known global merchant banks. In India, Axis Capital, Kotak Mahindra Capital Company, SBI Capital Markets, are examples of some of the large merchant bankers.

1.9.1(A) Role and Function of Merchant Bank

Merchant Banks provide a range of services, although not every merchant banker offers all the services. Following is list of important functions/services provided by merchant banks.

- 1. Issue management :** Merchant Bankers advise on the issuance of different types of securities such as equity shares, preference shares and debentures. Issue management services involve functions such as public issue, underwriting, marketing, pricing of issues.
- 2. Underwriting of public issue :** Merchant bankers coordinate and participate in underwriting of public issues, coordination with other underwriters etc.
- 3. Loan syndication :** The Merchant Banks arrange loans for the clients for their projects by forming a consortium of financiers.
- 4. Portfolio management :** Merchant Banks help their clients in investing and managing investment portfolio by investing funds into various asset classes such as equity, debt etc. depending on the risk appetite of the clients.
- 5. Broking :** Many Merchant Banks act as brokers of stock exchanges. They buy and sell shares and other listed securities on behalf of their clients.
- 6. Advisory on mergers/acquisitions :** Some Merchant Banks provide consultation and advisory services to the clients on strategic decisions such as expansion, mergers, acquisitions, takeovers, sale of business etc.
- 7. Valuation :** Merchant bankers provide valuation services for various purpose such as investment in unlisted securities, merger and acquisitions of business or a division of business, brand etc.
- 8. Project appraisal :** Merchant bankers provide services related to project appraisals from different angles of investment, technology, location, marketing etc.
- 9. Leasing services :** Some Merchant Banks are engaged in leasing services in which lessor allows the use of specific assets to the lessee for a certain period for payment of rentals.



1.9.1(B) Role of Merchant Banker is Public Issue

- Due diligence :** Merchant banker does the due diligence to prepare the offer document which contains all the details about the company. They are also responsible for ensuring compliance with the legal formalities in the entire issue process.
- Underwriting :** Sometimes company may appoint underwriters for the issue. Depending on the size of issue merchant banker acts a merchant banker on its own or in syndication with other underwriters and coordinate the issue process with underwriters.
- Marketing :** Merchant bankers are responsible for marketing of the issue. Merchant bankers arrange roadshows, where company official meet the prospective investors and gauge the response of the investors.
- Pricing :** Merchant bankers advise the management on pricing of the issue depending on the market conditions, response from investors etc.

1.9.1(C) Categories of Merchant Bankers

- Merchant banks in India are regulated by the Securities and Exchange Board of India (SEBI), which has classified merchant bankers into four categories Category I, Category II, Category III and Category IV merchant bankers.
- Category I merchant banker can act as Issue Managers, Consultants, Advisors, Portfolio Managers and Underwriters. Category II merchant banker cannot act as an issue manager but can act as a co-manager. Category III merchant banker cannot act as issuer or provide portfolio management services. Category IV merchant bankers can only act as advisor or consultant for issue of capital. At present there are more than 200 merchant bankers registered with SEBI.

1.9.2 Stock Exchanges

Stock exchange has been explained in details in the secondary market sub-section of the capital market section.

Review Questions

- Q. 1 Explain the meaning of Financial System and characteristics of financial system.
- Q. 2 Explain the role of financial system.
- Q. 3 What are the components of financial system?
- Q. 4 What are the financial markets and what are the types of financial markets?
- Q. 5 What the characteristics of financial market and role of the financial market?
- Q. 6 Distinguish between capital market and money market.

2

Return and Risk

Module - 2

Syllabus

Concepts of Return and Risk : Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio; Measurement of Historical Risk and Expected Risk 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.

Learning Objectives

- Components of return, measurement of historical and expected return.
- Understanding risk, measurement of risk on historical and expected returns, normal distribution curve.
- Measurement of historical and expected return of two security portfolio.
- Measurement of historical and expected risk of two security portfolio.

2.1 Concepts of Return and 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:

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

$$R = \frac{\text{DIV}_1}{P_0} + \frac{P_1 - P_0}{P_0} \quad \dots(2.1.1)$$

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

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

$$= \frac{0}{7} + \frac{5 - 7}{7} = \frac{-2}{7} = -28.6\%$$

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

2.1.2 Average Rate of Return

Capital market is considered as market for long term investments. Many investors hold securities for more than one year. For such investors average rate of return over a historical period convey a correct picture of returns than a 1-year return. The average rate of return refers to the average of returns for each period. The formula for average rate of return is as follows:

$$\bar{R} = \frac{1}{n} \sum_{i=1}^n R_i \quad \dots(2.1.2)$$

R_i - Rate of return for i^{th} period.

Illustration

Let's have a look the historical share price data to understand the average returns. Table 2.1.1 shows the share prices of MRF limited on 1st January of each year from 2010 to 2020. For the ease of understanding we have not considered the dividend declared by the company each year.

Table 2.1.1 : Share prices of MRF

Date	Closing price	Capital gain	% Return
01-01-2009	1,631		
01-01-2010	5,668	4,037	248%
01-01-2011	5,943	275	5%
01-01-2012	7,782	1,839	31%
01-01-2013	12,975	5,193	67%
01-01-2014	19,228	6,253	48%
01-01-2015	39,672	20,444	106%
01-01-2016	35,345	-4,327	-11%
01-01-2017	51,397	16,052	45%
01-01-2018	67,826	16,429	32%
01-01-2019	61,119	-6,707	-10%
01-01-2020	66,597	5,478	9%
Average			52%

Based on the Table 2.1.1 Average rate of return for MRF Limited in last 10 years will

$$R = \frac{248 + 5 + 31 + 67 + 48 + 106 + (-11) + 45 + 32 + (-10) + 9}{10}$$

$$R = 52\%$$

Note : Please note we have not considered dividends, including which the average rate of return will be even higher. It's a common practice to calculate average annual return while evaluating historical returns.



2.1.3 Holding Period Return

- In above examples we calculated the annual rate of return. What if we want to calculate the rate of return for the period for which we were holding the security. This return is referred to as the holding period return or HPR. Holding period return is expressed as a percentage and is the total return received from holding an asset or portfolio of assets over a period of time.
- The holding period return is calculated by multiplying a notional investment amount of 1 with returns on for each period and then subtracting 1 from the total value.

Illustration

Let's calculate the holding period return for MRF Ltd between 2015 to 2019, based on the price history as provided in Table 2.1.1. The annual returns considered for calculation are 2015 - (-11%), 2016 - (45%), 2017 - (32%), 2018 - (-10%), 2019 - (9%)

$$\begin{aligned} R &= 1 \times ((1 - 10\%) (1 + 45\%) (1 + 32\%) \\ &\quad (1 - 10\%) (1 + 9\%)) - 1 \\ &= (1) (0.90) (1.45) (1.32) (0.90) (1.09) - 1 \\ &= 1.69 - 1 = 0.69 \text{ or } 69\% \end{aligned}$$

- Holding period for 5-year period for MRF Ltd between 2015 to 2019 is 69%.
- If we were to calculate annual compound rate of return for the above period, we need to calculate the geometric which will be calculated as follows :

$$\begin{aligned} \text{Compound annual rate of return} &= \sqrt[5]{(0.90) (1.45) (1.32) (0.90) (1.09)} - 1 \\ &= 1.10 - 1.00 = 0.10 \text{ or } 10\% \end{aligned}$$

2.1.4 Measures of Risk for One Security

- In section 2.1.2, we calculated the average return of MRF Limited for 10-year period which was 52% p.a. However, the rate of return in each period was not constant and varied from between - 9% to 248%. This variation in rate of return gives rise to the risk. Measurement of this variation or uncertainty is the measure of risk associated with the investment. There are two measures of this variation or risk
 1. Variance and
 2. Standard deviation.
- Variance is calculated as the average of sum of square of difference between actual rate of return and average rate of return. Variance is expressed as σ^2 .
- Standard deviation is the square root of the variance and is expressed as σ

$$\text{Variance } (\sigma^2) = \frac{1}{(n - 1)} \sum_{i=1}^n (R_i - \bar{R})^2 \quad \dots (2.1.3)$$



$$\text{Standard Deviation } \sigma = \sqrt{\sum_{i=1}^n \frac{(R_i - \bar{R})^2}{(n - 1)}} \quad \dots (2.1.4)$$

where

R_i - Rate of return of security in i^{th} interval of period

\bar{R} - Average rate of return.

Illustration

Let's calculate variance for MRF Limited. We will follow the below steps.

1. Calculate the average rate of return. This is denoted as \bar{R} . As seen previously for MRF Limited $\bar{R} = 52$.
2. Then calculate the difference between the actual rate of return and average rate of return for each period.
3. Calculate square of each of this difference and take sum of the squares of each of this difference, which is denoted as $\sum(R - \bar{R})^2$.
4. Lastly divide this sum by $n - 1$, where n is number of observation in sample data.

We are dividing the sum by $n - 1$ to account for loss degree of freedom when we consider a sample data. This is because we are only considering sample from entire population of returns of the security. Let's calculate the variance for MRF Limited

Date	Annual Returns (%)	$(R - \bar{R})$	$(R - \bar{R})^2$
01-01-2009			
01-01-2010	248	196	38416
01-01-2011	5	-47	2209
01-01-2012	31	-21	441
01-01-2013	67	15	225
01-01-2014	48	-4	16
01-01-2015	106	54	2916
01-01-2016	-11	-63	3969
01-01-2017	45	-7	49
01-01-2018	32	-20	400
01-01-2019	-10	-62	3844
01-01-2020	9	-43	1849
TOTAL			54334
AVERAGE RETURN	52		



$$\sigma^2 = \frac{(248-52)^2 + (5-52)^2 + (31-52)^2 + (67-52)^2 + (48-52)^2 + (106-52)^2 + (-11-52)^2 + (45-52)^2 + (32-52)^2 + (-10-52)^2 + (-9-52)^2}{9}$$

$$\text{Variance } \sigma^2 = 6037$$

$$\text{Standard Deviation } \sigma = \sqrt[2]{6037} = 78$$

What does this indicate? MRF shares offered an average annual return of 52, but had a standard deviation of 78 which is an indicator of fluctuation of actual returns from average returns. This variation or fluctuations in returns is quite high and indication of high degree of volatility in returns. However, kindly note that the standard deviation for 10 years may not adequate to calculate the implied risk and the risk may be lower if we look at larger population of data. Whenever we invest in shares for short term, we should be prepared for the volatility in the prices.

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:

2.1.6 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:

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

2.1.7 Use of Standard Deviation and Normal Distribution

We have studied the examples where distribution of probability was discrete or returns had limited number of outcomes. However, in practice distribution of stock returns is more likely to be continuous as the stock returns can take values from a very high positive number to negative number. Such a continuous distribution of returns is called normal distribution. Normal distribution is a symmetrical, continuous, bell shaped curve as shown in Fig. 2.1.1.

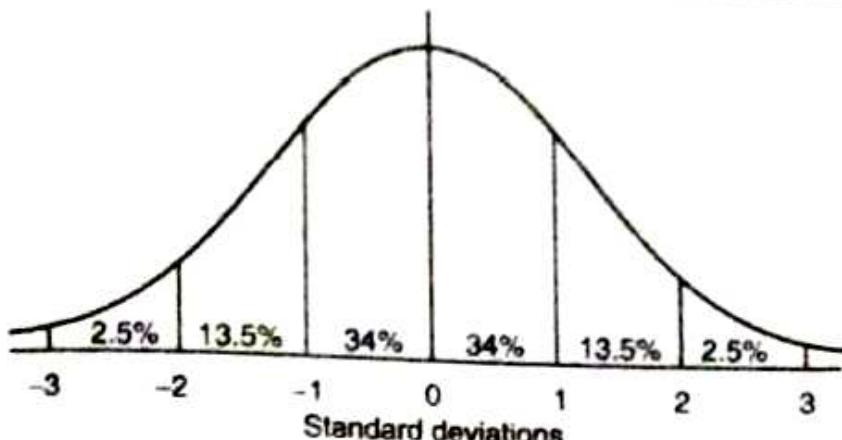


Fig 2.1.1 : Normal Distribution Curve

Normal distribution curve has following properties:

1. Area under the curve is equal to 1 and represents the probability of all the outcomes.
2. Maximum value of probability under the curve is at the expected value of distribution.
3. 50 percent of the area falls within (+/-) 0.67 standard deviation (right and left), 68 percent of the distribution falls within (+/-) 1 standard deviation (right and left) of the expected return; 95 percent falls within (+/-) 2 standard deviations (right and left); and over 99 percent falls within (+/-) 3 standard deviations (right and left).

Illustration

Let's take the case where average expected return or mean return is 15% and standard deviation is 10%. As per normal distribution, 68% of all returns will fall within 1 standard deviation right and left of the mean return i.e. (+/-) 10% of 15% i.e. between 5% and 25%. This also means that there is a 68% probability that returns will fall between 5% to 25%. The normal probability table (given at the end of the book) can be referred for determining area under normal curve for various standard deviations. For example, the probability of returns having 1 standard deviation higher than expected return i.e. 25% (10% higher than expected return of 15%) will be represented by the area on the right of 1 standard deviation i.e. 35%.

Normal distribution can be standardized using following formula

$$S = \frac{R - E(R)}{\sigma} \quad \dots(2.1.7)$$

Where

S is the difference between actual return and mean return expressed as multiple of standard deviation



Illustration

Let's use the concept of standard deviation to calculate probability of negative returns for the security XYZ Ltd. As mentioned in the Table 2.1.2, expected return or mean return of XYZ Ltd is 11% and the standard deviation is 11.35.

Answer

First, we need to calculate distance S of 0% from the mean return of 11% in terms of standard deviation.

$$S = \frac{(0 - 11)}{11.35} = -0.97$$

Above value indicates that 0% return will fall area equivalent to 0.97 standard deviations on left of from the mean return. As discussed above, area covered 1 standard deviation is 34%. Hence area corresponding to 0.97 standard deviation is 0.97 times 34% i.e. 32.98%.

Area on the curve on the left of 0.97 standard deviation will indicate the probability of negative returns i.e. 17.02% (50 - 32.98).

2.1.8 Two Security Portfolio

We have seen how to measure risk and returns for a single security. In practice, investors don't invest all funds in a single security but in multiple securities with primary objective of diversifying their investment. We have heard of an old idiom 'Don't put all your eggs in one basket', which effectively mean don't put all investment in one bucket. We all intuitively know that diversification reduces the risk. Let's see it mathematically.

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

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

2.1.8(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



2.1.9 Measuring Portfolio Risk for Two Security Portfolio

While the return of the portfolio is equal to the sum of weighted average returns of individual security, the risk calculation of portfolio is little different, although measures of risk i.e. standard deviation and variance is same. This because variance of portfolio depends on the co-movement of the securities in addition to the variance of individual securities. The co-movement or relationship between the returns of the securities is expressed by the term called as covariance.

Covariance is a statistical measure of the degree to which the variables move together. Positive covariance means returns of the securities move in similar direction meaning when one security has positive returns other will also have positive returns and vice versa. Negative value of covariance means returns of two securities move in opposite directions. Nil covariance means there is no relationship between returns of one security with other.

Variance of the portfolio is expressed as σ_p^2 ,

$$\text{Variance } (\sigma_p^2) = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2w_A w_B (\text{Cov}_{AB}) \quad \dots (2.1.9)$$

where

w_A, w_B represent weightage of security A and B in portfolio respectively

σ_A, σ_B represent standard deviation of security A and B respectively

Cov_{AB} represent covariance of security A and B.

Illustration

Let's calculate variance of a portfolio consisting 30% investment in security A and 70% in security B. A table showing probability and returns under different outcomes is provided below:

Scenario	Probability	R _A	R _B	R _A - E(R _A)	R _B - E(R _B)	σ_A^2	σ_B^2	Covariance
	1	2	3	4	5	(1)(2) ²	(1)(3) ²	(1)(4)(5)
Negative growth	0.2	-10	10	-21	0	88.1	0	0
Stable growth	0.3	10	20	-1	10	0.3	30	-3
High growth	0.5	20	4	9	-6	40.5	18	-27
		11	10			128.9	48	-30

$$\begin{aligned}
 \sigma_p^2 &= (0.30)^2 (128.9) + (0.70)^2 (48) + 2 (0.30) (0.70) (-30) \\
 &= (0.09) (128.9) + (0.49) (48) + 2 (0.21) (-30) \\
 &= 11.60 + 23.52 - 12.60 \\
 &= 22.52
 \end{aligned}$$

Standard deviation of portfolio σ_p is $\sqrt{22.52} = 4.74$.

The relationship between Covariance of two securities can be expressed in terms of standard deviation of security A and B as follows:

> Formula : $\text{Cov}_{AB} = (\sigma_A)(\sigma_B)(\text{Cor}_{AB})$

The term Cor_{AB} is called as correlation coefficient. The correlation coefficient is used to measure between two variables. It takes values between -1 to 1. Positive correlation indicates that movement of A and B are positively correlated, while negative value indicates negative correlation between movement of A and B. This expression indicates that the covariance of portfolio consisting A and B is multiplication of standard deviation of A and B and the correlation coefficient.

$$\text{Cor}_{AB} = \frac{\text{Cov}_{AB}}{(\sigma_A)(\sigma_B)}$$

The variance of portfolio can now be expressed as

$$\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2 (w_A)(w_B) (\sigma_A)(\sigma_B) (\text{Cor}_{AB}) \dots (2.1.10)$$

The above formula can also be used to calculate variance of the portfolio based on historical returns. In that case the variance of security A i.e. σ_A^2 and variance of security B i.e. σ_B^2 will be calculated based on historical returns.

Kindly note that the risk of the portfolio measured variance and standard deviation depends upon three factors 1) Correlation of the two securities and 2) Proportion of Investment in each security 3) standard deviation of each security.

2.1.10 Diversification and Reduction of Risk

- Securities having a correlation coefficient +1 means there is perfect positive correlation and combining these securities may not result in meaningful reduction in standard deviation.
- A correlation coefficient -1 means a perfectly negative correlation and combining these securities may offer highest reduction in risk.
- In general, combining securities with negative correlation will have highest impact in reduction of risk, while combining securities with positive correlation will be lower and will be impacted more by the standard deviation of each security.

Illustration

In the above example we calculated expected returns and risk of security A, security B and portfolio consisting 30% of security A and 70% of security B.

Particulars	Security A	Security B	Portfolio
Expected Return	11.00	10.00	10.30
Standard Deviation	11.35	6.93	4.74

Standard deviation of portfolio at 4.95 is much lower compared to 11.35 for security A and 6.93 security B. The above table suggests that by combining two securities, risk has reduced, not compromising much on returns. This mathematically proves that diversification of investments can reduce risk of returns in the capital markets.

Minimum variance portfolio

Let's assume we have finalized 2 securities for investment and now wish to create a portfolio such that the portfolio variance will be minimum. Portfolio variance will change depending on the proportion of the investment in two securities as two other factors i.e. standard deviation and correlation are fixed for the securities. Portfolio having minimum variance is called as minimum variance portfolio.

In a minimum variance portfolio, weight age of security A can be calculated using below formula

$$\text{Formula : } W_A = \frac{(\sigma_B^2 - \text{Cov}_{AB})}{(\sigma_A^2 + \sigma_B^2 - 2\text{Cov}_{AB})}$$

$$\begin{aligned} &= \frac{(48 - (-30))}{(128.9 + 48 - 2(-30))} \\ &= \frac{78}{256.9} \\ &= 0.30 \end{aligned}$$

Hence, the portfolio consisting of 30% of investment in security A and 70% in security B is also the minimum variance portfolio.

2.1.11 Solved Examples

Ex. 2.1.1 : Mr. Rameshwar Prasad bought 100 shares of Mahatma Capital Ltd for Rs.250 per share. Mahatma Capital every year declares a dividend of Rs.5 per share and is expected to continue same this year. Further, due to growth in capital market, share price of Mahatma Capital is expected to reach 275 at the end of the year. Calculate following returns for Mr. Prasad.

- | | |
|------------------------|--|
| 1. Capital gain amount | 2. Capital gain yield |
| 3. Dividend amount | 4. Dividend yield |
| 5. Total return amount | 6. Total return in percentage returns. |

Soln. :

$$\begin{aligned} \text{Capital gain per share} &= \text{Market Value of investment (expected)} - \text{Value of original investment} \\ &= 275 - 250 \\ &= 25 \end{aligned}$$

$$\text{Capital gain in amount} = (25)(100) = 2500$$

$$\text{Capital gain yield} = \frac{(275 - 250)}{250} = 10\%$$

$$\begin{aligned}\text{Dividend Income} &= (\text{Dividend per share})(\text{No. of shares}) \\ &= (5)(100) \\ &= 500\end{aligned}$$

$$\begin{aligned}\text{Dividend yield} &= \left(\frac{5}{250}\right) \\ &= 2\%\end{aligned}$$

$$\begin{aligned}\text{Total return} &= \text{Capital gain amount} + \text{Dividend amount} \\ &= 2500 + 500 \\ &= 3000\end{aligned}$$

$$\begin{aligned}\text{Total return in percentage} &= \frac{\text{Total return amount}}{\text{Original investment}} \\ &= \text{Capital gain yield} + \text{Dividend yield} \\ &= 10\% + 2\% \\ &= 12\%\end{aligned}$$

Ex. 2.1.2 : Calculate Expected Returns and Risk for Security A.

Outcome	Probability	Rate of Return (R)
Good	30%	15
Normal	50%	10
Bad	20%	5

Soln. :

Outcome	Probability	Rate of Return (R)	$p_i R_i$	$R - E(R)$	$(R - E(R))^2$	$p_i (E(R))^2$
Good	30%	15	4.5	4.5	20.25	6.075
Normal	50%	10	5	-0.5	0.25	0.125
Bad	20%	5	1	-5.5	30.25	6.05
		100%	10.5		50.75	12.25
					Expected Return	10.5
					Variance	12.25
					Standard Deviation	3.5

Ex. 2.1.3 : Calculate Expected Returns and Risk for Security B

Outcome	Probability	Rate of Return (R)
Good	30%	25
Normal	50%	10
Bad	20%	- 10
	100%	

Soln. :

Outcome	Probability	Rate of Return (R)	$p_i R_i$	$R - E(R)$	$(R - E(R))^2$	$p_i (E - E(R))^2$
Good	30%	25	7.5	14.5	210.25	63.08
Normal	50%	10	5.0	- 0.5	0.25	0.13
Bad	20%	- 10	- 2.0	- 20.5	420.25	84.05
	100%		10.5		630.75	147.25
					Expected Return	10.5
					Variance	147.25
					Standard Deviation	12.13

Ex. 2.1.4 : Calculate expected return and risk for Portfolio consisting of 50% of Security A and 50% of Security B.

Outcome	Probability (p)	(R_A)	(R_B)
Good	30%	15	25
Normal	50%	10	10
Bad	20%	5	- 10

Soln. :

Outcome	Probability (p)	(R_A)	(R_B)	Portfolio (R_p)	$E(R_p)$ pR_p	$R - E(R_p)$	$(R - E(R_p))^2$	$p(E - E(R_p))^2$
Good	30%	15	25	20	6.0	9.5	90.25	27.08
Normal	50%	10	10	10	5.0	- 0.5	0.25	0.13
Bad	20%	5	- 10	- 2.5	- 0.5	- 13.0	169	33.8
	100%				10.5		259.5	61
							Expected Return	10.5
							Variance	61
							Standard Deviation	7.8



Ex. 2.1.5 : An asset has an expected return of 25% and the standard deviation of possible returns is 12.5%. What is the probability of the return of asset will be zero or negative?

Sol. :

$$\begin{aligned} S &= \frac{R - E(R)}{\sigma} \\ &= \frac{0 - 25}{12.5} \\ &= -2 \end{aligned}$$

Negative returns are 2 standard deviations on the left side from the mean.

In normal distribution area under the curve upto $+/- 2$ standard deviation from mean is 95%.

Remaining area is 5% and is divided between high positive returns on the right side and negative returns on the left

$$\text{Probability} = \frac{5\%}{2} = 2.5\%$$

Review Questions

- Q. 1** What is return? Explain the components of returns.
- Q. 2** Define holding period return and show how it is calculated.
- Q. 3** Explain the concept of risk. How it is calculated?
- Q. 4** What is normal distribution? How it can be used for calculating probability of stock returns?
- Q. 5** What is coefficient of correlation? What is the relationship between covariance and coefficient of correlation?
- Q. 6** Explain how diversification reduces risk.

3

Time Value of Money

Syllabus

Time Value of Money : Future Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Present Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Continuous Compounding and Continuous Discounting.

'Time is Money' is one of the most commonly heard proverbs since our childhood. In this chapter we will understand the value of time in the context of investment and learn various concepts as mentioned.

Learning Objectives

- Concept of Time Value, Future Value, Rate of Return, Compounding.
- Future Value of a Lump Sum, Ordinary Annuity, and Annuity.
- Present Value of a Lump Sum, Ordinary Annuity, and Annuity Due.
- Continuous Compounding and Continuous Discounting.

3.1 Concept of Time Value of Money

- If we are given a chance to choose between receiving Rs.10000 today Vs Rs.10000 a year later, most of us will choose to receive today. There may be multiple reasons for this choice such as need for consumption i.e. meeting expenses at present or avoiding uncertainty of receiving money at the end of one year or to avoid loss of investment opportunity.
- The requirement for consumption may be subjective to each individual and uncertainty of investment will depend on the type of investment. However, the loss of investment opportunity will apply to all the situations.



- This is because we can always invest the money and expect to earn a positive return over this investment. Simplest example of investment is creating a fixed deposit in a bank for 1 year.
- Hence, most of the rationale human beings will choose Rs.10000 today over receiving the same amount a year later.
- This preference for receiving money now compared to receiving same amount of money at some later period is called the Time Preference for Money or Time Value of Money.

3.1.1 Future Value

When we choose to receive money in future over present, we will naturally expect higher amount than what we would receive today. Future Value refers to this higher amount that we expect to receive in future. Future Value is the amount to which a current or a present asset would grow over time. Investors can evaluate future value expected from different investment avenues and take informed decisions. This Future Value is important for investors and it allows them to take decisions on their investment.

Illustration

Let us continue with our example of Rs.10000 and assume that we decide to invest the amount in a 1-year bank deposit earning an interest rate of 7% p.a. In 1 year, at the rate of 7%, we will earn interest amount of Rs.700 and we will have Rs.10700 at the end of year 1. Let us represent the future value at the end of year 1 as FV_1 . In terms of mathematical formula FV of Rs. 10,000 after 1 year at 7% p.a. can be calculated as below :

$$FV_1 = 10,000 + 10,000 \times 7\% = 10000 \times (1 + 7\%) = 10,700.$$

3.1.2 Simple Interest and Concept of Compounding

In the above example by investing Rs.10,000 for 1 year, we earned an interest of Rs.700 which is simple interest. What if we choose reinvest interest along with principal at the end of 1 year? We will earn the interest over the principal of Rs.10,000 and on Rs.700 interest. Interest earned on the principal is called as simple interest, while the interest income earned on the principal and interest amount is called as the compound interest. This process of earning interest on principal and interest is called as compounding.

Illustration

What if we reinvest Rs.10,700 for one more year, the amount receivable after year 2 will be as follows:

$$FV_2 = 10,700 \times (1 + 7\%) = 10,000 \times (1 + 7\%)^2 = 11449$$

Total interest earned in 2 years will be 1449 (the difference between 11,449 and 10,000)

3.1.3 Rate of Return

- In the above example by investing Rs.10,000 for 1 year earned Rs.700 as an interest providing us a return of 7%. This also means that receiving Rs. 10,000 today, is equivalent to receiving Rs.10,700 a year later provided we invest our money in fixed deposit.
- So if we are offered an amount of any amount more than Rs.10700 at the end of 1 year, we will prefer to receive money after 1 year, provided there is no uncertainty. What if there is an element of risk in receiving money after 1 year? Will we expect similar return as 7%? We will expect a higher return to compensate for this uncertainty or risk. This rate of return expected from the investment will depend on the risk and is called as required rate of return. The required rate of return by an investor is the rate of return offered by investing in asset having equivalent risk and is same as opportunity cost of capital, which.
- What if we had invested this amount Rs.10,000 in share market. We will expect a higher return of may be 15% per annum on this investment. This expectation of higher return is due to higher risk involved in share market investment. This 8% difference between returns of 15% and 7% is called the risk premium. Risk premium refers to the extra return demanded by investors over risk free rate of return for the additional risk taken for investing in riskier assets.
- What if we are asked to choose between receiving Rs.10,000 today and Rs. 12,000 to be received in 2 years, assuming opportunity cost of capital of say 7% p.a. As seen above, 10,000 invested at 7% will become Rs. 11,449 and less than Rs. 12,000. In this scenario we will choose to receive Rs. 12,000 after 2 years than Rs. 10,000 today.
- Thus if we know required rate of return we can choose between different cash flows at different periods. Let's take one more example.

Illustration

Mr. Shah is considering a proposal to invest Rs.50 Lakh in a commercial property in Pune. The builder has promised that at the end of 2 years the value of property will appreciate to Rs.70 Lakh. If Mr. Shah has a required rate of return of 15%, kindly advise if Mr. Shah should invest in the property.

To compare Rs.50 Lakh today and Rs.70 Lakh after 2 years, let's calculate Future value after 2 years using required rate of 15% p.a.



$$\begin{aligned} FV_2 &= 50(1 + 15\%)^2 \\ &= 50(1.15)^2 = 50(1.323) = 66.125 \end{aligned}$$

As property offers higher appreciation, Mr. Shah should take favorable decision to invest in commercial property.

3.1.4 One-time Investing/Lump Sum Investing

Investors have an option of investing money in one go or at different intervals of time. When the funds are invested in one go, it is called lumpsum investing or one time investing. Future value of lumpsum investment can be calculated as below:

The Future Value FV_n can be expressed as

$$FV_n = P \times (1 + i)^n \quad \dots(3.1.1)$$

where

n = No. of periods

i = Rate of return per period

FV_n = Future Value at the end of period n

P = Principal amount or original investment amount

The factor $(1 + i)^n$ is called as Future Value Interest Factor (PVIF) or Compound Value Interest Factor (CVIF). It represents Future Value of Rs.1 invested for a period of n at the rate of i .

So if we substitute $(1 + i)^n$ with CVIF, the Future Value formula can be expressed as

$$FV_n = P \times CVIF_{n,i} \quad \dots(3.1.2)$$

where

$CVIF_{n,i}$ is the compound value interest factor for period of n at an interest of i and it represents value future value of Rs.1 invested for a period of n years at the rate of $i\%$ per period.

CVIF or Compound Value Factor makes it easy for calculation of Future Values involving large number of years without using computer or scientific calculator. CVIF table provides values for different combinations of interest rate and no of years.

Illustration

What will be the Future value of Rs.5000 invested for 7 years at the rate of 5% p.a?

Answer

Future value at the end of 7 years can be calculated by using formula

$$FV_7 = P \times (1 + i)^n$$

$$FV_7 = 5000 \times (1 + 5\%)^7$$

$$FV_7 = 5000 \times CVIF_{7,5\%}$$

We can refer to the CVIF or PVIF table below to calculate Future Value in this example

$$FV_7 = 5000 \times 1.407 = 7028$$

Table 3.1.1 : CVIF/FVIF Table

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727



CVIF chart shows the value of Rs.1 invested at different rate of return. As can be seen from the graph, the greater the interest rate, the steeper the growth curve by which future value increases. Also, the greater the number of years during which compound interest can be earned, obviously the greater the future value.

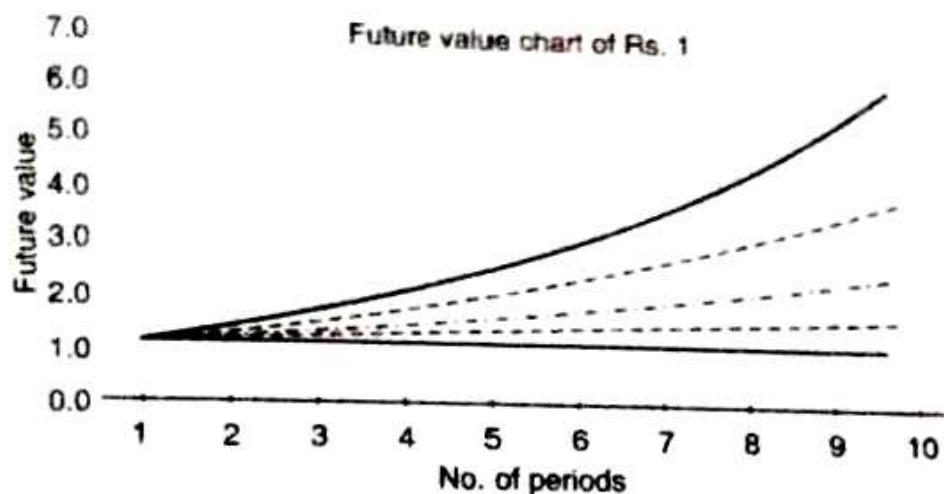


Fig. 3.1.1 : FVIF/CVIF Chart at different interest rates

3.1.5 Future Value of Annuity (Ordinary Annuity)

Annuity as the name indicates refers to fixed amount paid or received at annual frequency. More particularly it refers to stream of constant cash flows due every year. When the fixed amount of cash flows is received or paid at the end of the year or a period it is called Ordinary Annuity. In case cash flows are received or paid at the beginning of the year or a period it is called Annuity Due.

Illustration

In the above example, we invested Rs.5000 for 7 years in lump sum or in one go. Suppose instead if investing 5000 in Lump sum, we decide to deposit Rs.1000 at the end of each year for 5 years we have created an annuity. Alternatively, when we take car loan or housing loan, we repay the loan in constant monthly installments, we have created an annuity.

To calculate future value of Rs. 1000 annuity we will need to calculate the future value for each investment of Rs. 1000. The first investment of 1000 made at the end of year 1, will earn invest for 4 years, while the last investment of 1000 made at the end of 5 years will not earn any interest. This is expressed as below:



Diagram Showing 1000 investment for 5 years.

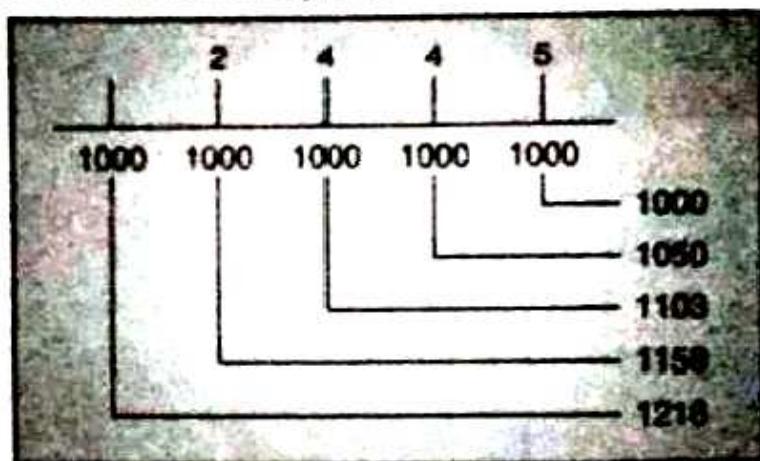


Fig. 3.1.2

$$\begin{aligned}
 FVA_5 &= 1000 \times (1 + 5\%)^4 + 1000 \times (1 + 5\%)^3 + 1000 \times (1 + 5\%)^2 \\
 &\quad + 1000 \times (1 + 5\%)^1 + 1000 \times (1 + 5\%)^0 \\
 &= (1000) \times (1.216) + (1000) \times (1.158) + (1000) \times (1.103) \\
 &\quad + (1000) \times (1.05) + 1000 \\
 &= 1216 + 1158 + 1103 + 1050 + 1000 = 5527
 \end{aligned}$$

The Future Value FV_n at the end of n year for the annuity value of Rs. A, at the rate of $i\%$ pa can be calculated as below:

$$\begin{aligned}
 FVA_n &= A \times (1 + i)^{n-1} + A \times (1 + i)^{n-2} + \dots + A \times (1 + i)^0 \\
 FVA_n &= A \times \frac{(1 + i)^n - 1}{i} \quad \dots (3.13)
 \end{aligned}$$

The term $\frac{(1 + i)^n - 1}{i}$ is called as Compound Value Interest Factor for Annuity (CVIFA) or Future Value Interest Factor for Annuity (PVIFA).

Thus a Future Value of Annuity can be expressed as below:

$$FV_n = A \times CVIFA_{n,i} \quad \dots (3.14)$$

Where

A - Annuity cash flow

CVIFA_{n,i} - Compound Value Interest Factor for Annuity of Rs.1 for n periods at the interest rate per period.

Table 3.1.2 shows the table of Future value of annuity of Rs.1 for different period and interest rates.

Table 3.1.2 : Future/Compound Value Interest Factor Table of Annuity (FVIFA/CVIFA)

Period	Future value interest factor of an ordinary annuity of Rs.1 per period at i% for n periods, CVIFA/FVIFA _(n,i)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100
3	3.030	3.060	3.091	3.122	3.153	3.184	3.215	3.246	3.278	3.310
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301	45.599
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275

Illustration

Mr. Mukherjee decides to invest an amount of Rs.1,00,000 each year for a period of next 20 years to create a corpus for future. He expects to earn a return of 10% each year on the invested amount. Calculate the Lumpsum amount that Mr. Mukherjee will receive at the end of 20 years.

Answer

Future value of annuity of Rs.1,00,000 at the end of 20 years can be calculated using annuity formula

$$\begin{aligned} FVA_{20} &= A \times CVIFA_{20,10\%} \\ &= 100,000 \times 57.275 \\ &= 57,27,500. \end{aligned}$$

This means a total investment of Rs.20 Lakh have become of Rs.57.28 Lakh. This also shows the importance of early investment and the power of compounding.

3.1.6 Sinking Fund

- Sinking Fund refers to a fund created using a constant amounts deposited at regular intervals to accumulate a future fund amount after a certain period. Sinking fund concept is used at many places such as creation of repair fund for a housing society, redemption of debenture by companies etc.
- Let's say a company has issued debentures amounting to Rs.100 Cr to a bank, maturing after a period of 5 years. Company needs to create a sinking fund to meet the redemption of this debenture after 5 years. Company expects to earn annual return of 7% p.a from the amounts kept aside. How much amount should a company set aside at the end of each year.
- In this example Future Value of Annuity or FVA is 100 Cr and annuity needs to be calculated. We can calculate the annuity by using the formula for Future Value of Annuity.

$$FV_n = A \times CVIF_{n,i}$$

$$A = \frac{FV_n}{CVIF_{n,i}}$$

$$A = \frac{100}{5.751}$$

$$A = 17.38 \text{ Cr}$$

In the above example the term $\frac{1}{CVIF_{n,i}}$ is called as Sinking Fund Factor.

3.1.7 Annuity Due

- In the above example of annuities, a constant sum was deposited at the end of each period. What if a fixed sum is set aside at the start of each period instead of end of the period.
- This annuity created by depositing a constant sum at the start of each period is called as Annuity Due. Annuity Due is a series of fixed payments made at the beginning of each period for specified number of periods.
- Whenever we buy any item on loan generally the bank will start recovering instalments from the beginning of the loan. For example, if we buy a mobile phone in the EMI scheme of 12 months, bank will start to recover instalment from the beginning of the month instead of a month. This is called Annuity Due.
- Let's say we invest Rs. 1000 at the beginning of year in each of the next 5 years. In this case the amount invested in the last will also earn a return as it remains invested for 1 year. Hence the calculation of Future Value will become

$$\begin{aligned} FV_n &= A \times (1 + i)^n + A \times (1 + i)^{n-1} + \dots + A \times (1 + i) \\ FV_n &= A \times CVIFA_{n,i} \times (1 + i) \end{aligned} \quad \dots(3.1.5)$$

3.1.8 Present Value of Money

- In previous sections, we understood how to calculate future value of cash flows and compare cash flows received at different periods of time. What if we were to calculate the present value of future cash flows to arrive at the decision? Present value is the value of cash flow available today, which is equivalent to the future value and is denoted as PV. Present value or PV is also called the discounted value as it is calculated by discounting the future cash flows. Process of discounting is reverse of compounding.
- The rate which is used to discount the future cash flows for calculating the present value is called the discount rate. When present value is invested at the discount rate it will match with future value.

Illustration

Suppose you were to choose between receiving Rs. 10,000 today or Rs. 12,000, 2 years down the line, using present value concept. Assume your discount rate is 7% p.a.

**Answer**

We will calculate the present value of Rs. 12,000 and compare it with Rs.10,000.

To calculate the present value, we have to discount the future value at the discount rate which is 7% p.a. in this case.

Formula for Future Value is

$$FV_2 = P(1 + 7\%)^2$$

$$12,000 = P(1 + 7\%)^2$$

$$P = \frac{1}{(1 + 7\%)^2} = \frac{12,000}{1.1449} = 10,481$$

The present value of Rs.12,000 is Rs.10,481, which is 481 higher than Rs.10,000.

Similarly, we can calculate Present Value of FV at the end of period n at required rate of i% p.a.

Present value is represented as PV. Using the above example, we can calculate PV by discounting Future Value at the rate of i.

$$PV = \frac{FV_n}{(1 + i)^n} \quad \dots (3.1.6)$$

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

$$PV = FV_n \times \frac{1}{CVIF_{n,i}}$$

The inverse of compound value interest factor is called as present value interest factor and denoted as PVIF. It represents present value of Rs.1.

$$PV = FV_n \times PVIF_{n,i} \quad \dots (3.1.7)$$

Where

PV - Present Value

FV_n - Future Value at the end of year n

i - Rate at which future cash flows are discounted is called as discount rate

PVIF_{n,i} - Present Value Interest Factor for a period n and interest rate of I per period

We can calculate the present values of Rs.1 for different combinations of discount rate.

Table 3.1.3 : Present Value Interest Factor Table

Period	Present value interest factor of Rs.1 per period at i% for n periods, PVIF _(n,i)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Present Value Chart

The graph shows the present value of Rs.1 at different discounting rates over different periods.

As seen from the graph the present value decreases as the time period increases and discounting rate increases.

The greater the interest rate, steeper is the decline in present value.

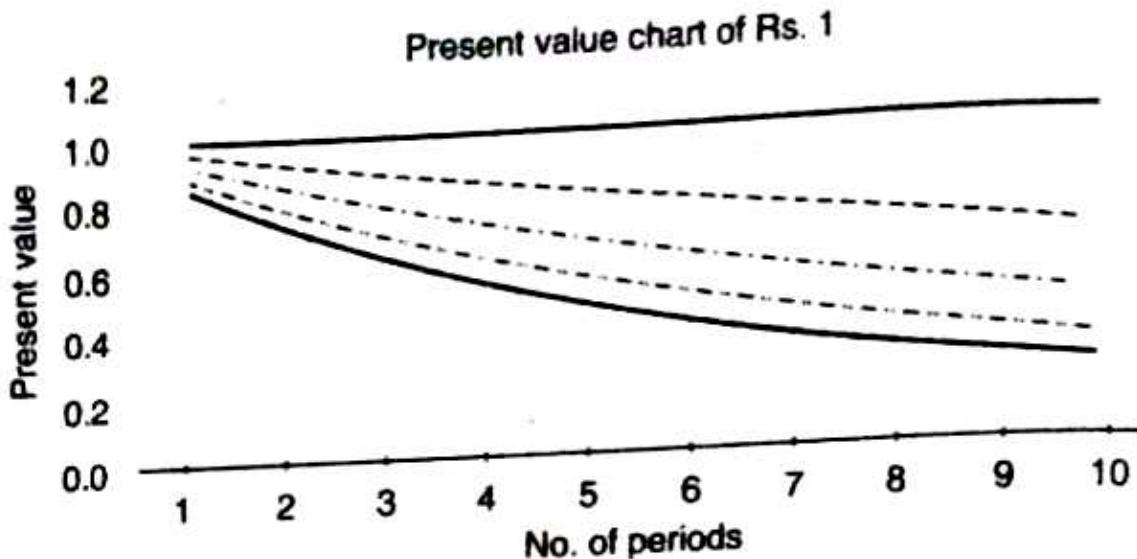


Fig. 3.1.3

3.1.9 Present Value of Annuity (Ordinary Annuity)

We have seen in previous sections that in case of ordinary Annuity stream of fixed cash flows occur at the end of the period. To calculate Present Value of annuity each of cash flow will be discounted separately. The present value of annuity PVA for annuity amount of A and n periods can be calculated as below:

$$PVA_n = \frac{A}{(1+i)^n} + \frac{A}{(1+i)^{n-1}} + \dots + \frac{A}{(1+i)}$$

$$PVA_n = \frac{A}{(1+i)} \left(\frac{1}{(1+i)^{n-1}} + \frac{1}{(1+i)^{n-2}} + \dots + 1 \right)$$

$$PVA_n = A \times \left(\frac{1}{i} - \frac{1}{i(1+i)^n} \right)$$

$$PVA_n = A \times PVIFA_{n,i} \quad \dots(3.1.8)$$

where

$PVIFA_{n,i}$ is present value factor of annuity of Rs.1 for n period for an interest rate of i per period.

PVA is present value of annuity and PVA_n for a period n.

Table 3.1.4 : Present value interest factor Table of an (ordinary) annuity PVIFA

Period	Present value interest factor of an (ordinary) annuity of Rs.1 per period at i% for n periods. PVIFA (n,i)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606

Illustration

An investment in a new business is expected to provide guaranteed return of Rs.10,000 each year at rate of 10% p.a. for next 5 years. Calculate the investment amount.

Answer

In above example, the investment is expected to provide an annuity of Rs.10,000.

Present value of 5-year annuity as represented by PVA_5 can be calculated as below:

$$PVA_5 = \frac{A}{(1+i)^5} + \frac{A}{(1+i)^4} + \frac{A}{(1+i)^3} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)}$$

$$PVA_5 = A \times PVFA_{5, 10\%}$$

$$PVA_5 = 10000 \times PVFA_{5, 10\%}$$

$$PVA_5 = 10000 \times 3.791 = 37,910$$

The amount that need to be invested is Rs.37,910.

Using the above formula, we can also calculate the annuity for a given value of investment, period of investment.



Illustration

XYZ Ltd plans to invest an amount of Rs. 1 Lakh in setting up a plant that is expected to generate fixed returns every year at an annual rate of 10%. Calculate the value of cash flows expected to be generated every year.

Answer

Here we are provided with the present value of annuity i.e. Rs. 1,00,000 and we need to calculate the value of annuity.

$$PVA_5 = A \times PVFA_{5,10\%}$$

Now as seen in the earlier example, we know that the value of present value factor of annuity for 5 years at 10% is 3.791. Hence

$$100000 = A \times 3.791$$

$$A = \frac{100000}{3.791} = 26,378$$

Similarly, for given value of annuity, investment and period of investment, we can calculate the implied rate of return.

Illustration

Let's calculate the implied rate of interest of an investment plan, which provides annuity of Rs. 26,378 on an investment of Rs. 1,00,000 for a period of 5 years.

$$100,000 = 26,378 \times PVFA_{5,i}$$

$$PVFA_{5,i} = \frac{100,000}{26,378} = 3.791$$

When we refer to Present Value Annuity Table for a period 5 years and value of 3.791, we get an interest rate of 10% p.a.

3.1.10 Present Value of Annuity Due

In case of annuity due, cash flows happen at the beginning of the year. Present value of the annuity due amounting to A will be calculated as below:

$$PVA_n = \frac{A}{(1+i)^{n-1}} + \frac{A}{(1+i)^{n-2}} + \dots + A$$

$$PVA_n = A \left(\frac{1}{(1+i)^{n-1}} + \frac{1}{(1+i)^{n-2}} + \dots + 1 \right)$$

The above expression can be written as below:

$$PVA_n = A (1+i) \left(\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{n-2}} + \dots + \frac{1}{(1+i)} \right)$$

This effectively means multiplying the present value of ordinary annuity with a factor of $(1 + i)$. Hence present value of annuity due can be expressed as below:

$$PVA_n = A \times PVFA_{n,1} (1 + i) \quad \dots(3.1.9)$$

3.1.11 Multi Period Compounding /Compounding for more than once a Year

- In all our previous examples, the cash flows are compounded annually i.e. interest is paid once a year. However, in practice we may receive interest more frequently than once a year, say semi-annually or quarterly. For example, corporate bonds may provide interest semi-annually or banks may give quarterly interest payment on savings deposits. In such cases, the investor is earning interest twice or four times a year. If this amount is re-invested, total interest earned will be higher than annual interest rate.
- The interest rate is usually mentioned on annual basis irrespective of the payment frequency as a common practice and is known as nominal interest. The actual interest rate for the year may be different depending on the frequency of compounding and is called effective interest rate (EIR).
- Let's calculate effective interest rate (EIR) on Rs.100 deposit which provides pay out, semi-annually at an interest at the rate of 10% p.a.

$$\text{Amount after 6 months} = 100 \times \frac{1 + 10\%}{2} = 105.$$

$$\text{Amount available after 1 year} = 105 \times \frac{1 + 10\%}{2} = 105 \times 1.05 = 110.25$$

- Interest income in 1 -year will $110.25 - 100 = 10.25$, which is also the effective interest rate.
- Effective interest rate can also be calculated by compounding 100 for 2 semi-annual periods at rate of 5% as shown below:

$$EIR = \left(\frac{1 + 10\%}{2} \right)^2 - 1$$

$$EIR = (1.05)^2 - 1$$

$$EIR = 10.25\%$$

- Similarly, in case quarterly payment the interest would be compounded 4 times in a year. EIR of $i\%$ nominal interest rate will be

$$EIR = \left(1 + \frac{i}{4} \right)^4 - 1$$

- Based on above understanding we can calculate the future for a given a period of time for a multi period compounding. Let's calculate the Future value of P invested for n years that pays interest m times a year at the rate of $i\%$ p.a.



$$FV_n = P \left(1 + \frac{i}{m}\right)^{mn}$$

...(3.1.10)

Where

i - rate of return per annum

m - number of compounding per year

n - number of years

- The present value can be calculated by discounting the future value by the same compounding factor

$$PV_n = \frac{FV_n}{\left(1 + \frac{i}{m}\right)^{mn}}$$

3.1.12 Continuous Compounding

In the above examples, we have seen compounding happen at discrete intervals e.g. annual, semi-annual, quarterly etc. Theoretically interest can be compounded at infinite intervals or continuously. As seen in the above example

$$FV_n = P \left(1 + \frac{i}{m}\right)^{mn}$$

As m the frequency of compounding in a year approaches infinity (∞) we get continuous compounding and the term $\left(1 + \frac{i}{m}\right)^{mn}$ approaches $(e)^{in}$ where e is approximately 2.71828

Therefore the future value of investment P where interest is compounded continuously at the interest rate of i is

$$FV_n = P(e)^{in} \quad \dots (3.1.11)$$

Example : Let's calculate future value of Rs.100 deposit at the end of 3 years with continuous compounding at 8 percent will be

$$\begin{aligned} FV_3 &= 100(e)^{(0.08)(3)} \\ &= 100(2.71828)^{0.24} = 127.12 \end{aligned}$$

How does this compare with the annual compounding?

$$FV_3 = 100 (1 + 8\%)^3 = 100 (1.08)^3 = 125.97$$

3.1.13 Present Value Using Continuous Discounting

Present value of the future value with continuous compounding can be calculated using continuous discounting. Such present value is calculated by inverting the future value formula as below.

$$PV = \frac{FV_n}{e^{in}}$$

...(3.1.11)

The "Rule of 72" and Double the money

A quick way to calculate interest or time required to double your money is the use of the "Rule of 72." This rule states that if the number of years, n , for which an investment will be held is divided into the value 72, we will get the approximate interest rate, i required for the investment to double in value.

For example, if we want to calculate the time required to double money if we invest in fixed deposit that yields an interest rate of 8% p.a.

$$\text{No. of years} = \frac{72}{8} = 9 \text{ years}$$

Alternatively, if want to double our money in 6 years, what should be the interest rate.

$$\text{Rate of interest} = \frac{72}{6} = 12$$

Please note Rule of 72 does not give the exact answer, but provides an easy way to calculate approximate value.

Using Excel for Time Value of Money

Excel provides easy tools for calculation of terms used in Time Value of money problems. We need to know following terms used while using excel formulae for time value of money problems

FV - Future value

NPER - Number of periods (e.g. for 4 years with quarterly compounding NPER will be 16)

RATE - Interest rate per period (e.g. 10% p.a. with quarterly compounding RATE will be 2.5%).

PMT - Periodic payment, used only for annuities.

PV - Present value

Functions may be entered directly or a function wizard may be used for input. If the functions are entered directly, the required inputs and structure are below.

Future Value = FV(rate, nper, pmt, pv, type); type refers to the timing of payment i.e. 0 for beginning of the period and 1 at the end of the period

Present Value = PV(rate, nper, pmt,fv, type)

NPER =NPER(rate, pmt, pv, fv, type)

RATE =RATE(nper, pmt, pv, fv, type, guess); here guess means estimated value of interest expressed in decimal e.g. 0.1 for 10%.

ANNUITY (PMT) = PMT(rate,nper,pv,fv,type)

Excel uses a sign convention that indicates whether an amount is a cash inflow or cash outflow. For example, for calculation of present when we input positive future value, it will provide negative present value, indicating the value of upfront investment.

For example, Present Value of Rs.1000 ordinary annuity at the rate of 10% for next 20 year will be calculated as = $\text{PV}(\text{rate}, \text{nper}, \text{pmt}, \text{fv}, \text{type}) = \text{PV}(10\%, 20, 1000, 0, 0) = -8.513$

3.1.14 Solved Examples (Refer to Future and Present Value Tables)

Ex. 3.1.1 : Calculate the future value of (1) Rs.1,000 invested for a period of 5 years at rate of interest of 10% p.a. (2) Rs.100 invested annually at the end of each year at interest rate of 10% p.a.

Soln. :

(a) Future value of lumpsum investment of Rs.1000

$$\begin{aligned} FV &= 1000 (1 + 10\%)^5 \\ &= 1000 (CVIF_{5,10\%}) = (1000) (1.611) = 1611 \end{aligned}$$

(b) Future value of annual investment of Rs.100 i.e. FV of annuity

$$\begin{aligned} FVA &= A \frac{(1 + 10\%)^5 - 1}{1} \\ &= 100 \frac{(1 + 0.10)^5 - 1}{0.10} = 100 (CVIFA_{5,10\%}) = (100) (6.105) \\ &= 610.50 \end{aligned}$$

Ex. 3.1.2 : Calculate the present value of Rs.1,000 receivable at the end of 5 years, if interest is compounded (a) annually (b) quarterly (c) continuously. Opportunity cost of capital (required rate of return) is 10 percent per annum.

Soln. :

$$\text{Present Value PV} = \frac{FV_n}{\left(1 + \frac{i}{m}\right)^{mn}}$$

Where

FV_n - Future value at the end of year n

i - rate of return per annum

m - number of compounding per year

n - number of years

$$\begin{aligned} \text{(a) Present Value for annual compounding PV} &= \frac{1000}{(1+10\%)^5} \\ &= \frac{1000}{1.611} = 620.73 \end{aligned}$$

$$\begin{aligned} \text{(b) PV formula for Quarterly Compounding PV} &= \frac{1000}{\left(1 + \frac{10\%}{4}\right)^{4 \times 5}} \\ &= \frac{1000}{(1 + 2.5\%)^{20}} = \frac{1000}{1.639} \\ &= 610.27 \end{aligned}$$



(c) PV formula for Continuous compounding $PV = \frac{FV}{e^{rt}}$

$$PV \text{ for future value of Rs.1000} = 1000/e^{0.05} = \frac{1000}{1.649} = 606.42$$

Ex. 3.1.3 : Mr. Patil plans to invest an amount of Rs.25,00,000 to purchase an annuity that will provide him with a steady income over the next 10 years. He has heard that an insurance plan provides guaranteed 8 percent compound interest on an annual basis. If he were to invest his funds, what the amount that he would be able to withdraw annually such that he would have a zero balance after his last withdrawal 10 years from now?

Soln. :

In this example, present value of the investment is provided and the investor wants to purchase 10-year annuity offering him annual interest rate of 8.

$$25,00,000 = (A) (PVIFA_{10, 8\%})$$

$$25,00,000 = (A) (6.710)$$

$$A = \frac{25,00,000}{6.710} = 3,72,578$$

Ex. 3.1.4 : You have inherited a debenture investment having residual maturity period of 6 years and pays an amount Rs. 3,000 at the end of each year. Prevailing market price of debenture is Rs.13,869. What is the implicit rate of return?

Soln.:

$$PVA = (A)(PVIFA_{n, i})$$

$$13,869 = 3,000 (PVIFA_{6, i})$$

$$PVIFA_{6, i} = \frac{13869}{3000}$$

$$PVIFA_{6, i} = 4.623$$

After referring to the table Present Value of annuity, value 4.623 corresponds to interest rate of 8% p.a.

Review Questions

- Q. 1 Explain various motive for time preference for money.
- Q. 2 Explain why the interest in multi period compounding is higher than annual compounding?
- Q. 3 What is an annuity? Why is present value of annuity due is higher than ordinary annuity?



4

Financial Management

Syllabus

Overview of Corporate Finance : Objectives of Corporate Finance; Functions of Corporate Finance-Investment Decision, Financing Decision, and Dividend Decision. Financial Ratio Analysis: Overview of Financial Statements-Balance Sheet, Profit and Loss Account, and Cash Flow Statement. Purpose of Financial Ratio Analysis; Liquidity Ratios; Efficiency or Activity Ratios; Profitability Ratios; Capital Structure Ratios; Stock Market Ratios; Limitations of Ratio Analysis.

Very often a difference between success and failure of a business can be attributed to efficiency of the financial management. A company having a highly successful product can slowly go into oblivion if it fails manage its finances properly. On the other hand, a company losing market can survive and make a comeback if it has strong finances. This chapter introduces the reader to world to the corporate finance.

Learning Objectives

- **Financial Management, Functions of Financial Management**
- **Objectives of Firm and Corporate Finance**
- **Financial Statements – Balance Sheet, Profit & Loss, Cash Flow**
- **Financial Ratios - Liquidity Ratios; Efficiency or Activity Ratios; Profitability Ratios; Capital Structure Ratios; Stock Market Ratio**
- **Limitations of Ratio Analysis**

4.1 Introduction to Financial Management

- A successful business is built on the pillars of three critical functions i.e. production, marketing and finance.
- Production and marketing functions work towards creation and delivery of products and services desired by the customers, while the finance function ensures uninterrupted funding support for these functions.

- Finance is like life blood of company and needed for efficient functioning of every activity of business from initial investment to selling goods and services on credit to customers.
- The finance function in the business is also called Corporate Finance and the management of this function is known as Financial Management.
- Traditionally financial management was only tasked with raising funds; however, it has evolved over a period to cover functions of investment management and profit distribution.
- According to Guthman and Dougal, financial management means, "the activity concerned with the planning, raising, controlling and administering of funds used in the business."

4.1.1 Financial Management Decisions

Finance management covers three main responsibilities of the business i.e. arranging finance, investment of funds into assets and distribution of profits. These functions involve three decisions mentioned as below

1. Investment Decisions
2. Financing Decisions
3. Dividend Decision

In addition to the above functions, Finance is also responsible for managing liquidity position for the company to ensure uninterrupted funding for day to day operations.

4.1.1(A) Investment Decisions

- 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.

- 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.

4.1.2 Objective of Corporate Finance

- Effectiveness of financial management decisions can be gauged from its success to achieve the objective.
- It may seem that maximization of profit and dividends are natural objectives of the corporate finance. Every business is set up to make money or earn profit from sale of its products and services. Hence, one may argue that profit maximization is the most obvious objective of the company.
- Profit maximization can be defined as the management of financial resources aimed at increasing the profit of the firm. Profit maximization can be achieved through range of actions such as raising the prices of product and/or producing more for same cost by cost reduction or more efficient production. If a firm goes on to increase prices to take advantages of high demand, market will attract more sellers and once demand supply are in equilibrium, price will stabilize.
- These actions will provide short term profits for the company. Company can also achieve higher profits in short term by avoiding investments and saving on interest costs. However, it may impact future prospect of the company. On the contrary what if it makes large investments that provides returns after a very long period?
- The goal of profit maximization mainly suffers from following shortcomings:
 1. **Short term or long-term profit :** Profit maximization objective does not specify short- or long-term profit maximization, hence is ambiguous in guiding actions of the firm.
 2. **Time of Value of money :** Profit maximization objective fails to consider the time value of money.
 3. **Risk management :** Profit maximization objective does not consider the risk and uncertainty in the business.
- Maximization of profit was considered main objective of the firm till the concept of shareholders wealth maximization came into being overcome the shortcomings of profit maximization.



- Finance managers are the agents of the shareholders and the objective of corporate finance function is to maximize shareholders wealth. Shareholders are the owners of the firm hence the maximization of shareholders wealth is synonymous with maximization of owners' wealth.

4.1.2(A) Shareholders' Wealth Maximization

- Shareholders of the firm are interested in maximization of returns on their investment which is maximized when the value of the firm is maximized.
- Value of the firm is sum of net present value (NPV) of all the cash flows of the firm.
- NPV considers actual cash flows overcoming flaws of accounting treatment, time value of money, uncertainty or risk profile of future cash flows by considering an appropriate rate of discounting.
- All those projects with positive net present value (NPV) are considered for investment. Finance manager will prioritize projects that offer the best returns for the acceptable level of risk.
- Objective of shareholders wealth maximization provides a framework for taking decision on investment, financing or profit distributions as finance will choose decisions that maximize the NPV of the firm.
- Most of the large companies are publicly listed and their shares are traded on stock exchanges. Hence, for listed companies, shareholders' wealth maximization also means maximization of market price of its shares.

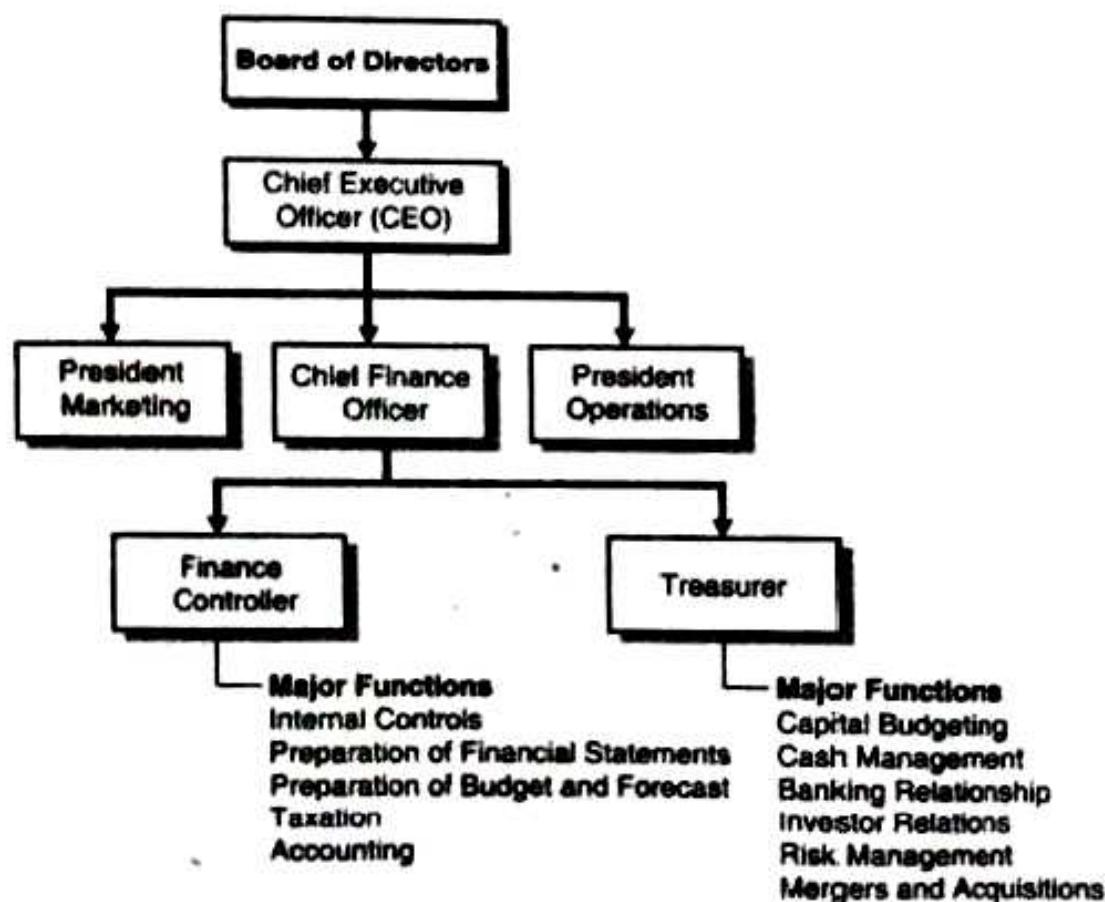
4.1.3 Agency Problems

- In large companies, generally the ownership and management of the company is divorced. Shareholders own the company and professional managers are responsible for running the business and take decisions for the company.
- Relationship between shareholders and the managers is that of Agency in which managers act as agents for shareholders with objective of maximizing shareholders' wealth.
- The separation of ownership from management may give rise to situations where managers may act in its own best interests rather than those of the shareholders.
- Managers may prioritize to maximize their wealth in the form salaries and perks, take decisions that may subordinate shareholders' interests in favor of other stakeholders or may altogether avoid every risky project to safeguard their position in the company, leading to loss of potential opportunities for the company.
- This conflict between the interests of shareholders and managers is called as the **Agency Problem**. The agency problem leads to agency costs, which includes the cost incurred for monitoring and controlling actions of managers and possibility of less than optimum share price of the company.

- Many companies give stock options to the managers to ensure that the interests of shareholders and managers are aligned. However, still there may be situations of conflict in the interest of managers and shareholders.
- Shareholders appoint directors on the Board of the company. The company's board has a primary responsibility to keep an oversight on the managers' actions, performance, remuneration etc. and guide the management. Scrutiny of outside analysts or corporate governance advisory firms also help reducing the risk of conflict of interest between shareholders and managers.

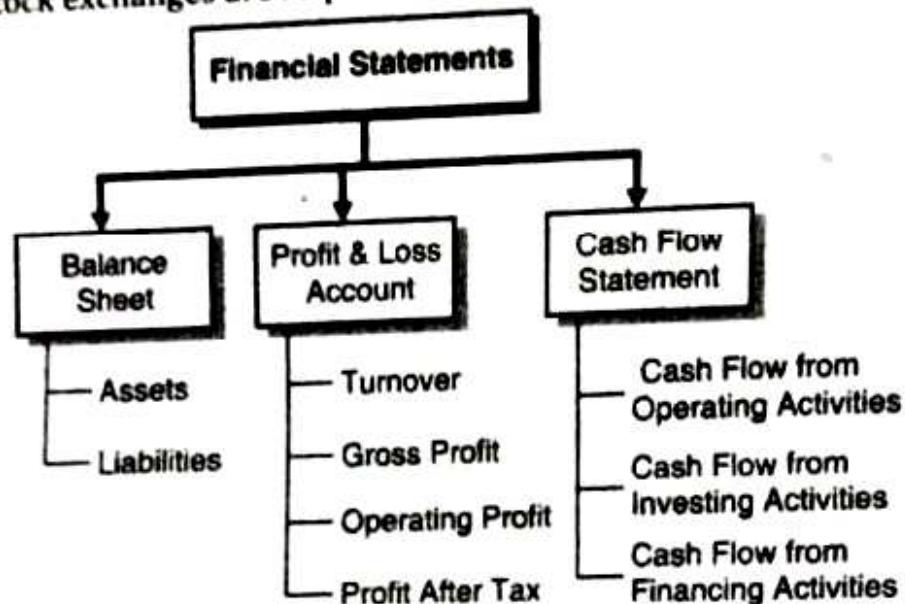
4.1.4 Organization of Finance Function

- Finance function is very critical function for the organization; inefficient financial management can also lead to failure of the companies; Hence, the finance function directly reports to the managing director or head of the company.
- The executive heading the finance function in an organization is known as Chief Finance Officer (CFO) or sometimes director of finance.
- In large companies, CFO will delegate the responsibilities to the Finance Controller and Treasurer. Following chart explains the functions and responsibilities of these officers.



4.2 Financial Statements

- Financial statements are the records of financial performance and financial position of the company in a specific period.
- Financial statements are the main source of financial information for all the decision makers and are used by the management, investors, shareholders, creditors, regulators, tax departments etc.
- Financial statements include Balance Sheet, Profit & Loss account and Cash Flow statement and are prepared each year.
- Financial year is also called as fiscal year and in India starts from April 01 to March 31.
- Companies are required to prepare financial statement for this period. In India, companies listed on main stock exchanges are required to file financial statements every quarter.



4.2.1 Balance Sheet

- Balance sheet is a summary statement of assets, liabilities and owners' equity at a point of time.
- Asset is a resource with economic value owned and controlled by the individual or an entity that is expected to provide future benefits. Examples of assets are plant and machinery, cash, fixed deposits etc.
- Liability is a financial obligation owed by the individual or an entity to external parties such as loans, credit, tax payments etc.
- Balance sheet provides a picture of the financial position at that point of time for example, balance sheet as on March 31, 2020 will provide a statement of assets and liabilities on that day.

Balance sheet of the company provides following important information

1. How much assets are owned by the company?
2. How is company financing the assets?
3. How is the company's liquidity position?
4. What is the owners' equity in the company?

Let's take an example of balance sheet and understand important items of the balance sheet.

Particulars (Amount in Rs Lakh)	31-Mar-20	31-Mar-19
Equity and Liabilities		
Shareholders' Funds		
Share Capital	6,000	6,000
Reserves and Surplus	5,875	2,500
Total Shareholders' Funds	11,875	8,500
Non-Current Liabilities		
Long Term Borrowings	2,000	2,000
Long Term Provisions	1,250	1,250
Total Non Current Liabilities	3,250	3,250
Current Liabilities		
Short Term Borrowings	3,200	3,000
Trade Payables	2,700	2,500
Short Term Provisions	1,500	1,250
Total Current Liabilities	7,400	6,750
TOTAL	22,525	18,500
Assets		
Non-Current Assets		
Fixed Assets		
Tangible Assets	11,000	10,000
Intangible Assets	-	-
Total Fixed Assets	11,000	10,000
Non-Current Investments	-	-
Current Assets		
Inventories	3,000	2,250
Trade Receivables	3,950	3,000
Cash and cash equivalents	4,375	3,000
Other Current Assets	250	250
Total Current Assets	11,575	8,500
TOTAL	22,575	18,500

Assets

Assets are classified between current assets and non-current assets. Current assets are those assets that can be converted into cash within a period of 1 year. Non-current assets cannot be converted into cash easily.

Current assets include

- Cash and cash equivalents such as fixed deposits, treasury bills etc.
- Marketable securities such as listed equity and debt securities.
- Inventory which include raw material, finished goods etc.
- Debtors which include receivables due to sale on credit to customers,
- Other current assets such as tax claims etc.

Non-current assets include

- Fixed assets which include plant and machinery, building, land, furniture, IT assets etc. Fixed assets have finite useful life and undergo wear and tear. Hence, the value of fixed assets is amortized over the period of useful life of asset by allocating expense each year. This expense is called as depreciation.
- Investments that cannot be easily liquidated in 1 year or not intended to be liquidated within 1 year such as investments in other companies, securities etc.
- Intangible assets such as patents, brand, goodwill. These typically arise in case of acquisitions.

Liabilities

Liabilities are categorized into current, non-current liabilities and shareholders' funds. Current liabilities include the obligations that are due and payable within 1 year. Non-current liabilities include obligations are payable after 1 year.

Current liabilities include

- Trade payables arising due to purchases on credit.
- Short term borrowings such as cash credit, overdraft, loans repayable in one year etc.
- Other current liabilities such as provisions for taxes, dividends etc.

Non-current liabilities include

- Long term borrowing repayable after 1 year.
- Tax liabilities payable over long term also called as deferred tax liabilities.

Shareholders' Funds is owners' capital and reserves and surplus accumulated over a period company's operations.

4.2.2 Profit & Loss Account

- Profit & Loss account is a statement of company's financial performance for a given period. Profit & Loss account is also called as P & L account and provides a summary of the sales, expenses and profits/loss in each period of time.
- The period for which P & L statement is prepared is called as accounting period. Accounting period is generally a period of 1 year and in India spans between April 01 to March 31.
- Listed companies are required to report P & L account every quarter and file the same with stock exchanges.
- P & L account is prepared using 'matching concept'. Matching concept refers to the principle of accounting expenses against the revenues earned during that period.
- For example, expenses incurred for purchase of stocks to be sold next year will not be accounted this year but will be accounted in next year's P & L statement.

Let's take an example of P & L statement of ABC Pvt. Ltd.

Particulars (Amount in Rs. Lakh)	2020	2019
Net Revenue	34,000	29,000
Other income	2,000	1,800
Total Revenues	36,000	30,800
Operating Cost		
Cost of Materials Consumed	24,500	21,000
Employee Benefit Expense	3,000	2,500
Other Expenses	2,500	2,000
Depreciation and Amortization Expense	500	450
Profit Before Interest and Tax	5,500	4,850
Finance Costs	1,000	850
Profit Before Tax	4,500	4,000
Income Tax	1,125	1,000
Profit After Tax	3,375	3,000

Main categories of P & L statement of a company include :

- Revenues from sale of goods/services also referred to as operating revenues.

- Income received from interest, rent, dividends, sale of equipments etc. also called as non-operating revenues.
- Expenses incurred on consumption of materials called as cost of goods sold.
- Employee expenses, selling and administration etc.
- Depreciation on fixed assets reflecting amortization in the value of fixed assets. Expenses including cost of goods sold, employees, selling and administration and depreciation are called as operating expenses.
- Interest expense on the borrowings.
- Profit before tax.
- Tax expenses.
- Profit after tax.

Profit has following main categories

- **Gross Profit (GP) :** This is the difference between sales and cost of goods sold. Cost of goods sold is the material consumed for the goods sold during the period. Material consumed in unsold goods becomes part of inventory reported in the balance sheet.
- **Profit before depreciation, interest and taxes (PBDIT) :** This refers to the amount equivalent to revenues minus all operating expenses after excluding depreciation. Depreciation is excluded as it is only an allocation of fixed asset cost.
- **Operating profit (PBIT/EBIT) :** This refers to profit/earnings before interest and tax and is the difference between revenues and all operating expenses.
- **Profit before tax (PBT) :** This refers to difference between operating profit and interest expenses and also includes non-operating incomes. PBT means the difference between income and expenses excluding taxes.
- **Profit after tax (PAT) :** This refers to the difference between PBT and taxes.

4.2.3 Cash Flow Statement

Cash flow statement is a statement of change in cash position of the company between two balance sheet dates. It summarizes the sources and uses of cash into three categories i.e. operating activities, investing activities and financing activities. Sum of the three categories is the change in cash position of the company. Analysis of cash flow statement of the company provides important insights about the quality of the company's earnings.

Let's take an example of cash flow statement of ABC Pvt Ltd.

Particulars (Amount in Rs Lakh)	2020	2019
Cash Flows from Operating Activities		
Net Profit before tax	3,375	3,000
Adjustment for		
Depreciation	500	450
Interest expenses	1,000	850
non-operating income	-	-
Operating profit before working capital changes	4,875	4,300
changes in working capital	- 1,500	- 1,300
Net cash flow from operating activities	3,375	3,000
Cash Flows from Investing Activities		
Purchase of Fixed Assets	- 1,000	500
Sale of Fixed Assets	-	-
Non-operating Income	-	-
Net Cash Flow Investing Activities	- 1,000	500
Cash Flows from Financing Activities		
Interest Paid	- 1,000	- 850
Dividend Paid	-	-
Repayment from Long Term Borrowing	-	-
Net cash flow from Financing Activities	- 1,000	- 850
Net increase/decrease in cash and cash equivalents	1,375	2,650

Cash flow from operating activities

This refers to the sources and uses of cash from operations of the business. In simple words it is the difference between cash received during the period from sales and the cash payment made towards operating expenses.

Operating cash flow is calculating by using profit after tax as starting point and adjusting for non-operating incomes and expenses, changes in current assets and current liabilities.

Cash flow from investing activities

This refers to the sources and uses of cash from company's investments. This includes purchase and sale of fixed assets such as land, building, equipments, purchase and sale of investments, interest and dividend income etc.

Cash flow from financing activities

This refers to the sources and uses of cash to banks, financial institutions, investors etc. This includes repayment of loans, payment of interest, payment of dividend, issuance of new shares, additional borrowings etc.

4.3 Financial Ratio Analysis

- Financial statements of a firm are analysed by the internal and external stakeholders i.e. management, investors, bankers, suppliers and customers for taking important decisions. For example, suppliers use them to decide whether to give more credit or reduce the credit to the company.
- Investors may use it to decide on holding on to shares, sell or purchase the shares. Bankers will like to decide whether to extend new loans or cap the exposure to the company. Customers will like to see if company is capable of investing required resource to fulfill a large project. Management will like to analyse the financial statements to benchmark against competition and identify areas of improvement.
- Financial Ratio analysis is the study of ratios of the financial parameters of the company. It is used to understand financials of the company on many parameters as mentioned below
 1. Liquidity
 2. Efficiency
 3. Profitability
 4. Capital Structure
 5. Valuation or stock market ratios

4.3.1 Liquidity Ratios

- As the name suggests liquidity ratios are used to study liquidity position of the company. Liquidity ratios helps to understand the company's ability to meet its current liabilities i.e. obligations that are payable within 1 year.

- Lack of adequate liquidity may lead to company defaulting on its payment obligations. Financial and trade creditors can become jittery, stop extending fresh credit or may start demanding early repayments of existing credit. If liquidity doesn't improve in time, it can result in loss of business and can also lead to bankruptcy situations in the worst case.
- Excess liquidity may not have such negative impact but can have less than optimum returns. The most common liquidity ratios are current ratio and quick ratio.

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) = $\frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$

Illustration**Balance Sheet of ABC Ltd.**

Particulars (Amount in Rs. Lakh)	31-Mar-20	31-Mar-19
Equity and Liabilities		
Shareholders' Funds	6,000	6,000
Share Capital	5,875	2,500
Reserves and Surplus	11,875	8,500
Total Shareholders' Funds		
Non-Current Liabilities	2,000	2,000
Long Term Borrowings	1,250	1,250
Long Term Provisions	3,250	3,250
Total Non Current Liabilities		
Current Liabilities	3,200	3,000
Short Term Borrowings	2,700	2,500
Trade Payables	1,500	1,250
Short Term Provisions	7,400	6,750
Total Current Liabilities		
TOTAL	22,525	18,500
Assets		
Non-Current Assets		
Fixed Assets		
Tangible Assets	11,000	10,000
Intangible Assets	-	-
Total Fixed Assets	11,000	10,000
Non-Current Investments	-	-
Current Assets		
Inventories	3,000	2,250
Trade Receivables	3,950	3,000
Cash and cash equivalents	4,375	3,000
Other Current Assets	250	250
Total Current Assets	11,575	8,500
TOTAL	22,575	18,500

$$\begin{aligned}\text{Current ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ &= \frac{11,575}{7,400} = 1.56.\end{aligned}$$

$$\begin{aligned}\text{Quick ratio} &= \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \\ &= \frac{11,575 - 3,000}{7,400} = 1.16\end{aligned}$$

4.3.2 Efficiency or Activity Ratios

Company invests funds in creation of fixed and current assets in the normal course of business. Efficiency or activity ratios are used to study how efficiently a company is using its assets.

4.3.2(A) Inventory Turnover

Inventory turnover ratio indicates number times company turns over the inventory each year and provides information on how quickly company is able to sell its inventory. For example, inventory turnover ratio of 9 indicates that the company is able to sell its inventory nine times a year.

➤ **Formula :** Inventory turnover ratio = $\frac{\text{Cost of goods sold}}{\text{Average Inventory}}$

The average inventory is the average of opening and closing inventory.

We can calculate inventory holding period of Inventory days by dividing no of days of the year by inventory turnover ratio. For example, if a firm has an inventory turnover ratio of 9, inventory days will be $\frac{365}{9} = 40.5$ days.

➤ **Formula :** Inventory days = $\frac{365}{\text{Inventory turnover}}$

$$= 365 \times \frac{\text{Average inventory}}{\text{Cost of goods sold}}$$

For the external stakeholders, such as analysts cost of goods may not be available. In such cases, they can use sales in place of cost of goods sold to calculate inventory turnover ratio.

➤ **Formula :** Inventory turnover ratio = $\frac{\text{Sales}}{\text{Average Inventory}}$

Sometimes in place of average inventory they use closing inventory in the denominator.

$$\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Inventory}}$$

Kindly note that the most appropriate measure of inventory turnover ratio is of cost good sold to average inventory as both the cost of goods sold, and inventory are mentioned on the cost price.

What is the appropriate value of inventory turnover ratio?

Inventory turnover ratio depends on the industry of operations and inventory turnover ratio of company needs to be compared with ratios in past and other firms in the industry. Further, for firms having high seasonality, average inventory is calculated as average of monthly closing inventory to even out the effect of seasonality.

Illustration

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

$$= \frac{24,500}{\left(\frac{(3000 + 2250)}{2} \right)} = 9.33$$

$$\text{Inventory days} = \frac{365}{\text{Inventory turnover ratio}} = \frac{365}{9.33} = 39.12 \text{ days}$$

Where cost of sales is not available, sales can be used in place of cost of sales.

4.3.2(B) Debtors Turnover

- Debtors represent the amount receivables by firm from its customers. A firm sells its goods on cash or credit. Debtors turnover ratio provides a measure of number of times debtors turnover each year and is used to calculate efficiency of the collection of receivables. It is calculated as follows:

➤ Formula : Debtors turnover ratio = $\frac{\text{Sales}}{\text{Average Debtors}}$

where

Average debtors is the average of opening and closing debtors.

- Debtor Days or Collection period indicates an average number of days for which debtors remain outstanding or in other words average number of days taken by the company to collect cash from the debtors. Debtor days or average collection period is calculated as below:

➤ Formula : Debtor days (collection period) = $\frac{365}{\text{Debtors turnover}}$

- Effectiveness of company's credit policy and efficiency of collections can be assessed by comparing debtor days with competitors and with the company's own credit policy. For example, if a company has policy to extend 30 days credit and the average collection period is close to 30, then the collection operations are said to be efficient.

- If the collection period much higher compared to 30, let's say 45 days, then company's collection efficiency is low. It also means company's customers are not very credit worthy and are needed to be watched carefully.

Illustration

$$\text{Debtors turnover ratio} = \frac{\text{Sales}}{\text{Average Debtors}} = \frac{34,000}{\left(\frac{(3950 + 3000)}{2}\right)} = \frac{34,000}{3475} = 9.78$$

$$\text{Debtor days} = \frac{360}{\text{Debtors turnover ratio}} = \frac{360}{9.78} = 37.32 \text{ days}$$

4.3.2(C) Ageing Schedule

This refers to the analysis of debtors based on number of days for which they are outstanding. In this, outstanding debtors are categorized as per the ageing of receivables i.e. number of days since when they are outstanding. Ageing analysis provides a picture of slow-moving debtors.

Ageing (no. of days)	Outstanding Amount (Rs.)	Percentage of Total Debtors
0 - 30	50,00,000	50.0%
31 - 60	22,50,000	22.5%
61 - 90	22,50,000	22.5%
More than 90 days	5,00,000	5.0%
Total	100,00,000	100.0%

4.3.2(D) Asset Turnover Ratio

It the measure used to calculate the efficiency of total assets of the company. It is the ratio of sales to total assets. Higher the ratio better is the efficiency of the assets.

➤ Formula : Assets turnover ratio = $\frac{\text{Sales}}{\text{Average Total Assets}}$

OR

Sometimes, analysts use Sales/Total Assets to calculate asset turnover ratio

➤ Formula : Fixed assets turnover ratio = $\frac{\text{Sales}}{\text{Average Fixed Assets}}$

OR

Sometimes, analysts use Sales/Fixed Assets to calculate fixed asset turnover ratio

Illustration

$$\text{Asset turnover ratio} = \frac{340000}{\left(\frac{(22575 + 18500)}{2} \right)} = \frac{340000}{20537} = 1.66$$

4.3.3 Profitability Ratio

In the profit and loss statement, we have seen different types of profit measures such as gross profit, PBDIT, operating profit, PBT etc. While these profit measures provide absolute value of profits, they don't provide us the information about the efficiency of company's operations. Profitability ratios help in measurement of the efficiency.

4.3.3(A) Gross Profit Margin

It is the ratio of gross profit to the sales of the company and is expressed in percentage terms. It is the amount of gross profit earned by the company for each Rs.100 sales.

$$\begin{aligned}\text{Gross Profit Margin} &= \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}} \\ &= \frac{\text{Gross Profit}}{\text{Sales}}\end{aligned}$$

4.3.3(B) Operating Profit Margin

It is the ratio of operating profit to the sales of the company. It is the amount of operating profit earned by the company for each Rs.100 sales.

$$\begin{aligned}\text{Operating Profit Margin} &= \frac{\text{Sales} - \text{Operating expenses}}{\text{Sales}} \\ &= \frac{\text{Operating Profit}}{\text{Sales}}\end{aligned}$$

4.3.3(C) PBDIT/EBITDA Margin

It is the ratio of profit before interest depreciation and tax to the sales of the company. It is the amount of operating profit earned by the company for each Rs.100 sales.

$$\begin{aligned}\text{Operating Profit Margin} &= \frac{\text{PBDIT}}{\text{Sales}} \\ &= \frac{\text{Sales} - \text{Operating expenses} + \text{Depreciation}}{\text{Sales}}\end{aligned}$$

4.3.3(D) Net Profit Margin

It is the ratio of profit after tax to the sales of the company and is expressed in percentage terms. It shows the information us the amount of gross profit earned by the company for each Rs.100 sales.

$$\text{Net Profit Margin} = \frac{\text{Profit after tax}}{\text{Sales}}$$

Illustration

Particulars (Amount in Rs. Lakh)	2020
Net Revenue	34,000
Other Income	2,000
Total Revenues (A)	36,000
Operating Cost	
Cost of goods sold (B)	24,500
Gross profit (C) = (A-B)	11,500
Gross profit margin (C)/(A)	31.94%
Employee Benefit Expense(D)	3,000
Other Expenses (E)	2,500
PBDIT/EBITDA (G) = C-D-E	6,000
EBITDA margin (G)/(A)	16.67%
Depreciation and Amortization Expense (F)	500
EBIT (H) = (C-D-E-F)	5,500
EBIT Margin (H)/(A)	15.28%
Finance Costs (I)	1,000
Profit Before Tax (J)	4,500
Income Tax	1,125
Profit After Tax (K)	3,375
Net profit margin (K)/(A)	9.38%

4.3.4 Capital Structure Ratios

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 ratio. It provides us the information how is company financing the assets.

4.3.4(A) Debt-equity Ratio

$$= \frac{\text{Total debt}}{\text{Total equity}}$$

4.3.4(B) Total Debt Ratio

$$= \frac{\text{Total debt}}{\text{Total Capital}} = \frac{\text{Total Debt}}{\text{Total Debt} + \text{Total Equity}}$$

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.

4.3.5 Return Ratios

Return ratios are used to calculate the efficiency of the company's investments. Analysts compare the return ratios of different companies to compare efficiencies and company's having higher return ratios generally command higher market value.

4.3.5(A) Return on Equity (ROE)

It is the ratio of profit after tax to the average equity and is expressed in percentage terms. It shows how much return company is earning on the shareholders' equity.

$$\text{Return on equity (ROE)} = \frac{\text{Profit after tax}}{\text{Average equity}} \text{ OR}$$

$$\text{Sometimes, Return on equity} = \frac{\text{Profit after tax}}{\text{Shareholders' equity}}$$

4.3.5(B) Return on Investment (ROI)

It is the ratio of earnings before interest and taxes and average of total assets. It shows how much return company can generate on total assets.

$$\text{Return on Investment (ROI)} = \frac{\text{EBIT}}{\text{Average total assets}}$$

where, EBIT is earnings before interest and tax

OR

$$\text{Sometimes, Return on Investment (ROI)} = \frac{\text{EBIT}}{\text{Total assets}}$$

Illustration**Debt to Equity Ratio**

Refer to Balance sheet of ABC Ltd for 2020.

$$\begin{aligned}\text{Total Debt} &= \text{Short term debt} + \text{Long term debt} \\ &= 2,000 + 3,200 = 5,200\end{aligned}$$

$$\text{Total Equity} = 11,875.$$

$$\text{Debt to equity ratio} = \frac{5,200}{11,875} = 0.54.$$

4.3.6 Stock Market Ratios (Valuation Ratios)

Stock market ratios are used to calculate the valuation of the company's shares using certain benchmark financial parameter. Analysts, investors use these ratios to compare with other companies in the industry or with the historical valuation of the company.

4.3.6(A) Price to Earnings Ratio (P/E Ratio)

This is the ratio of market price of share to the earnings per share of the company. Earnings per share is the net profit of the company divided by total number of shares.

$$\frac{P}{E} = \frac{\text{Share price}}{\text{Earnings per share}}$$

4.3.6(B) Price to Book Ratio (P/B Ratio)

This is the ratio of market price of share to the book value per share of the company. Book value per share is shareholders' equity of the company divided by the total number of shares.

$$\frac{P}{B} \text{ ratio} = \frac{\text{Share price}}{\text{Book value per share}}$$

4.3.6(C) Price to Sales (P/S Ratio)

- This is the ratio of market price of share to the sales per share of the company. Book value per share is total sales of the company divided by the total number of shares.

$$\frac{P}{S} \text{ ratio} = \frac{\text{Share price}}{\text{Sales per share}}$$

- Lower the value of these ratios means that the share price is trading comparatively cheaper compared to the denominator value, which may signify that the share prices may be attractive to buy.

- Stock market ratios can be calculated both on historical and forecasted basis. In case of the historical basis, analysts compare current market price with the historical financials of the company.

- While calculating valuation ratios on forecasted financials, analysts forecast the financials of the company for the future periods generally 2-3 years and calculate the ratios using current market price and forecasted financials.

Illustration

Company	A	B
Share price (P)	250	350
Sales per share (S) (Total Sales/No. of shares)	100	150
Earnings per share (E) (Net Profit/No. of shares)	25	40
Book value per share (B) (Shareholders' equity/No. of shares)	125	200
P/E	10	8.75
P/B	2	1.75
P/S	2.5	2.33

4.3.7 Use of Ratio Analysis

Ratio analysis is very useful tool for investors, management, lenders etc. It helps in following manners.

- Trend analysis :** Financial ratio analysis helps to compare current performance of company with past performance and helps in study of different trends. For example, a company selling 5 different products, compare gross profit margins of these product with each other and also with their historical performance and form opinion on trends on demand, competitive scenario etc.
- Benchmarking with competition :** Performance of one company can be benchmarked with other companies in industry by comparing the ratios. However, it is important to consider companies of similar size for more useful comparison.
- Areas of improvement :** Study of financial ratios can help management identify areas of improvement.
- Decision making :** Study of financial ratios can help management to take important decisions on future expansion, contraction, sale or purchase of units etc. Investors can use results of financial ratio analysis, to decide on investment or sale of securities of a company.

4.3.8 Limitations of Ratio Analysis

Ratio analysis is used an important tool for analysis a company's performance. However, it should not be used as the only source for analysis, as it has limitations and that need to understand before judging company's performance based on the ratio analysis. Important limitations of ratio analysis are as below:

- 1. Historical information :** Ratio analysis is based on historical financial information. For major stakeholders such as Investors, lenders etc. future performance of the company is more relevant performance. Company's future financial results may not be in line with the past performance.
- 2. External Factors :** Company's financial performance depend on the external environment such as competition, regulatory changes, global recession etc. Ratio analysis does not consider the impact of these factors.
- 3. Operational changes :** Ratio analysis does not factor impact of internal changes of the company. For example, new product launch, appointment of new management etc.
- 4. Changes in accounting policy :** Companies can change accounting policy and procedures. In such cases, reported financial numbers for that period may not be comparable with financial results of the past. Hence, comparison of financial ratios for two periods will become different. Further, accounting policies of two companies may be different, making the comparison between the two difficult. Analysts are expected to adjust the reported numbers while calculating the ratios and comparing the ratios.
- 5. Manipulation of financial statements :** Financial statements of companies are required to be audited by the chartered accountants. However, chartered accountants rely on the financial information provided to them by the management. In fact, preparation of financial statements many times involve interpretation of accounting standards and an element of judgment. Management can interpret such policies as per their convenience. For example, in some cases, large number of debtors may be not being recoverable and need to be accounted as loss, but management may certify that these amounts are recoverable. In such cases, financial statements and the ratio analysis may not provide true and fair picture of the company's performance.
- 6. Seasonality :** Large number of businesses are dependent of seasonal changes in demand and supply. In such cases performance of company in accounting period can be substantially different from performance in other accounting period. Analysts need to consider the effect of seasonality while using ratio analysis.

4.3.9 Solved Examples

Ex. 4.3.1 : A company has total sales of Rs.55,00,000, cost of goods sold at Rs.40,00,000 and closing inventory of 5,00,000 and total assets of Rs.45,00,000. Calculate the gross profit margin, inventory turnover ratio, asset turnover ratio.

Soln. :

$$\text{Gross profit margin} = \frac{\text{(Sales - Cost of goods sold)}}{\text{Sales}} \\ = \frac{(55,00,000 - 40,00,000)}{55,00,000} = 27.2\%$$

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Inventory}} = \frac{55,00,000}{5,00,000} = 11 \text{ times}$$

$$\text{Asset turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{55,00,000}{40,00,000} = 1.22$$

Ex. 4.3.2 : A company has total sales of Rs.55,00,000, total shareholders' equity of Rs.20,00,000 and profit after tax of Rs.5,00,000. The company has 50,000 shares outstanding and market price per share is Rs.75. Calculate return on equity, price to earnings ratio, price to book ratio.

Soln. :

$$\text{Return on equity} = \frac{\text{Net profit}}{\text{Shareholders' equity}} \\ = \frac{5,00,000}{20,00,000} = 25\%$$

$$\text{Earning per share} = \frac{\text{Net profit}}{\text{No. of shares outstanding}} \\ = \frac{5,00,000}{50,000} = 10$$

$$\frac{P}{E} \text{ ratio} = \frac{\text{Price per share}}{\text{Earnings per share}} \\ = \frac{75}{10} = 7.5$$

$$\text{Book value per share} = \frac{\text{Net worth or Shareholders' equity}}{\text{No. of shares outstanding}} \\ = \frac{20,00,000}{50,000} = 40.$$

$$\frac{P}{B} \text{ ratio} = \frac{\text{Price per share}}{\text{Book value per share}} = \frac{75}{40} = 1.87$$

Ex. 4.3.3 : Following is the extract of the balance sheet Sumitomo Electric and Samara Electric. Calculate following ratios for both companies and conclude which has better net profit margins, return on equity, higher current ratio, inventory turnover ratio.

Particulars	Sumitomo Electric	Samara Electric	Who is better
Sales	75,00,000	90,00,000	
Net profit	7,50,000	9,90,000	
Shareholders' equity	75,00,000	1,00,00,000	
Current assets	40,00,000	40,00,000	
Inventory	20,00,000	28,00,000	
Debtors	15,00,000	15,00,000	
Cash and marketable securities	15,00,000	7,00,000	
Current liabilities	30,00,000	40,00,000	
Current ratio	1.33	1.00	Sumitomo
Inventory turnover ratio	4.50	3.57	Sumitomo
Net margin	10%	11%	Samara
ROE	10%	9.9%	Sumitomo

Soln. :

$$1. \text{ Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Sumitomo Electric current ratio} = \frac{40,00,000}{30,00,000} = 1.33$$

$$\text{Samara Electric current ratio} = \frac{40,00,000}{40,00,000} = 1.00$$

$$2. \text{ Inventory turnover ratio} = \frac{\text{Sales}}{\text{Inventories}}$$

$$\text{Sumitomo inventory turnover ratio} = \frac{90,00,000}{20,00,000} = 4.50$$

$$\text{Samara inventory turnover ratio} = \frac{1,00,00,000}{28,00,000} = 3.57$$

$$3. \text{ Net profit margin} = \frac{\text{Net profit}}{\text{Sales}}$$

$$\text{Sumitomo Electric net profit margin} = \frac{7,50,000}{75,00,000} = 10\%$$

$$\text{Samara Electric net profit margin} = \frac{9,90,000}{90,00,000} = 11\%$$

$$4. \text{ Return on equity} = \frac{\text{Net profit}}{\text{Shareholders equity}}$$

$$\text{Sumitomo Electric ROE} = \frac{7,50,000}{75,00,000} = 10\%$$

$$\text{Samara Electric ROE} = \frac{9,90,000}{1,00,00,000} = 9.90\%$$

**Review Questions**

- Q. 1 What are the main functions/decisions of a finance manager?
- Q. 2 Why is shareholders' wealth maximization objective being better than profit maximization objective?
- Q. 3 What is the agency problem and why does it arise?
- Q. 4 What are the mitigants to resolve agency problems?
- Q. 5 How does ratio analysis help in financial analysis?
- Q. 6 What are the ratios to measure liquidity of the firm?
- Q. 7 What are the activity ratios; how does current assets turnover ratio, fixed asset turnover ratio indicate?
- Q. 8 What are the limitations of ratio analysis?

5

Module - 4

Syllabus

Capital Budgeting

Capital Budgeting : Meaning and Importance of Capital Budgeting; Inputs for Capital Budgeting Decisions; Investment Appraisal Criterion-Accounting Rate of Return, Payback Period, Discounted Payback Period, Net Present Value (NPV), Profitability Index, Internal Rate of Return (IRR), and Modified Internal Rate of Return (MIRR).

Long term investment decisions are probably the most critical of the corporate finance decisions as they have the potential to shape the future of the business. Investment in new technology at the right time or a wrong acquisition can make or break a company's fortunes. In this chapter we understand how to evaluate the long - term capital decisions.

Learning Objectives

- Capital Budgeting - Meaning, Importance, type of projects
- Investment Decision criteria - capital budgeting appraisal techniques

5.1 Capital Budgeting Decisions

- The investment decision involves decision to invest funds in creation of long term and short-term assets (current assets). Among the two type of assets decisions on investment in long term assets are more critical as they typically involve large sums of money and provide returns over a longer period. Examples of long-term investments are purchase of equipment, land, building, acquisition, joint venture, divestment etc. The long-term investment decisions are called as capital budgeting decisions. The investment decision in short term assets is called as working capital decisions.
- The primary objective of any firm is to maximize shareholders' wealth. Hence, finance manager needs to assess multiple proposals before finalizing projects for investment. Capital budgeting is the process of capital allocation and refers to the decisions on the investment in long term assets and projects of the company.



- Capital budgeting process involves
 1. Identification of investment projects.
 2. Evaluation of investment proposal
 3. Selection of investment proposals
 4. Preparation of capital budget and implementation
 5. Performance review of the investment projects.
- Capital budgeting uses inputs such as requirement of investment, estimated cash flows, time period of cash flows, projected financials, expected rate of return etc. to evaluate various investment proposals.

5.1.1 Importance of Capital Budgeting

Capital budgeting differs from current expenditure and has following characteristics which make them most important investment decisions for a company.

1. Capital budgeting decisions involve outlay of large investment amounts.
2. It helps to control costs of the projects by optimizing expenses.
3. Capital budgeting decisions have long term impact on the performance of the company.
4. Capital budgeting decisions are generally irreversible in nature.
5. Capital budgeting decision involve an element of uncertainty or risk.
6. Capital budgeting decisions are critical for shareholder wealth maximization.
7. It involves review of the performance of projects and feedback.

5.1.2 Types of Investment Projects

Investment projects can be classified into following 3 types based on their dependence on each other.

Independent Projects

These projects are not related to each other and decision of selection of the projects can be done independent of another. A firm if deems fit can choose or reject all the independent projects based on the investment appraisal.

Mutually exclusive projects

These are mutually exclusive projects, which means that when a company chooses one project other projects automatically get rejected. Examples of mutually exclusive projects are selection of semi-automatic or fully automatic manufacturing set up, in house manufacturing or outsourcing.

Complementary projects

Sometimes two projects under evaluation are complementary to each other, meaning selection of one project requires selection of another project.

5.2 Investment Appraisal - Capital Budgeting Techniques

Investment proposals are carefully appraised before finalization using capital budgeting techniques. Most commonly used capital budgeting techniques are as mentioned below.

1. Accounting Rate of Return (ARR)
2. Payback Period (PB)
3. Net Present Value Method (NPV)
4. Internal Rate of Return (IRR)
5. Modified Internal Rate of Return (MIRR)
6. Profitability Index (PI)

In all the above methodologies, except for Accounting Rate of Return (ARR), cash flows and not the accounting profits/losses are considered as basis to calculate returns and investment in the projects.

5.2.1 Accounting Rate of Return (ARR)

Accounting Rate of Return (ARR) is also called as Average rate of return measures profitability of the investment using financial accounting information. Accounting rate of return is the ratio of average annual profit after tax for the projected period to the average investment. The average investment is calculated by taking an average of initial investment and value at the end of the life of the project. At the end of project life, the value of investment may be fully depreciated, or it may have some salvage value.

$$\text{ARR} = \frac{\text{Average net profit}}{\text{Average investment}}$$

$$\text{Average net profit} = \frac{\text{Total net profit for the life of the project}}{\text{No. of years}}$$

$$\text{Average Investment} = \frac{1}{2} (\text{Initial Investment} + \text{Salvage value})$$

Some times in the calculation of average investment working capital is also added.

Acceptance Rule

- In this method, all projects having an ARR higher than minimum hurdle rate decided by management are accepted.
- In case of mutually exclusive projects, one having highest ARR is accepted.

Illustration

Following details of the two projects X and Y are provided in the Table 5.2.1. Calculate the project having the highest accounting rate of return.

Table 5.2.1

Net Profit	X	Y
Year 1	4,000	3,500
Year 2	5,000	4,500
Year 3	6,000	5,500
Year 4	7,000	6,500
Total	22,000	20,000

Project	Investment	Salvage Value
X	50,000	5,000
Y	40,000	5,000

$$\text{Average Net profit for X} = \frac{(4000 + 5000 + 6000 + 7000)}{4} = 5,500$$

$$\text{Average Net profit for Y} = \frac{(3500 + 4500 + 5500 + 6500)}{4} = 5,000$$

$$\text{Average investment for X} = \frac{(50000 + 5000)}{2} = 27,500$$

$$\text{Average investment for Y} = \frac{(40000 + 5000)}{2} = 22,500$$

$$\text{ARR for X} = \frac{5,500}{27,500} = 20\%$$

$$\text{ARR for Y} = \frac{5,000}{22,500} = 22\%$$

Project Y has higher IRR compared to project X.

Merits and Demerits**Merits**

- It is very simple method as it accounting statements are readily available.
- ARR incorporates accounting profitability that is used by analysts.

Demerits

- It ignores the cash flows and only rely on the accounting profits.

2. It does not consider time value of money.
3. It doesn't provide the value added to the shareholders.
4. It does not take into account the risk profiles of different projects.

5.2.2 Payback Period

Payback period is the amount of time taken by the firm to recover the investment in the project. It is generally expressed in number of years. In other words, it is the time taken by the firm to achieve breakeven.

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.

Merits and Demerits of using Payback Period

Merits

- It is very simple technique to select investment projects.
- If focuses on near term returns, thus avoid uncertainty associated with projects with long payback period.
- It may be easier to obtain funding for projects with lower payback period.

Demerits

- It ignores cash flows after the payback period.
- It ignores the time value of money.
- It ignores the risk element in the projects.
- It is not consistent with the shareholder value maximization, as projects having longer payback period are rejected despite higher cash flows over longer period.

5.2.3 Discounted Payback Period

In the discounted payback period method, simple cash flows are substituted by discounted cash flows to account for time value of money. In this method all the cash flows involving in a project are discounted using an appropriate discount rate, which is typically the opportunity cost of capital or rate of return expected from a project having equivalent risk.

Illustration

In the above example, let's assume the firm has required rate of return of 10%.

Table 5.2.3

Year	Cash Flow	Discounted Cash Flow $\frac{CF}{(1+i)^n}$	Cumulative discounted Cash Flow
0	- 500	- 500	- 500
1	100	91	- 409
2	175	145	- 264
3	225	169	- 95
4	225	154	

From the Table 5.2.3, we understand that cumulative cash flows become zero between year 3 and 4. The payback period for the project falls between year 3 and 4. At the end of year 3 cumulative cash flows equal -95 Lakh.

$$\text{No. of years required for recovery of Rs. 95 Lakh} = \frac{95}{154} = 0.62.$$

$$\text{Discounted payback period} = 3 + 0.62 = 3.62 \text{ years.}$$

Merits and Demerits of using Discounted Payback Period

Merits

1. It focuses on near term returns, thus avoid uncertainty associated with projects with longer payback period.
2. Discounted payback period takes into consideration time value of money.

Demerits

1. It ignores cash flows after the payback period.
2. It involves estimation of additional variable i.e. discounting rate.
3. It is not consistent with the shareholder value maximization, as projects having longer payback period are rejected despite higher cash flows over longer period.

5.2.4 Net Present Value Method (NPV)

Net present value or NPV is the sum of present value of all current and future cash flows. In this method, NPV for each investment project is calculated. Projects having positive NPV are expected to enhance shareholders value and can be selected for investment. If the firm must choose between mutually exclusive projects, then the project having a maximum NPV is selected.

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.

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.

Merits and Demerits of using NPV method

Merits

1. NPV method provides the absolute value added to the firm by choosing an investment project.
2. NPV method considers time value of money and risk of investment.
3. NPV method considers the cash flows over the complete life of the project.
4. NPV method provides unambiguous methodology for selection of projects.

Demerits

1. NPV calculation can vary substantially depending on the assumption of discount rate.
2. NPV method considers same discount rate for cash flows in near and longer future of the project, which may have different levels of risk.
3. NPV method is not very useful for selecting among projects having materially different investment requirement.

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 initiate 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

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

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

► 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.

Merits and Demerits of using IRR method

Merits

- Investors can compare IRR with the required rate of return and take decision on the selection of projects.
- IRR measure can be used to compare projects having different investment requirements.

Demerits

- Selection of projects based on IRR method does not consider the overall value added to the firm.
- IRR assumes that all future cash flows are reinvested at the IRR.
- IRR can be used only when there is requirement of initial investment involving cash outflow at initial period. For the projects involving multiple net cash outflows, the IRR formula can provide more than one value. In such cases, use of IRR becomes confusing.

5.2.6 NPV Profile

- NPV method and IRR method generally provides same results while selecting conventional projects having initial outflows followed by net positive cash flows in subsequent periods. In the above project involving Rs.500 Lakh investment, NPV was positive and the IRR of 20.3% was higher than discounting rate of 10%. Both the methods concluded acceptance of the project.
- NPV is inversely related to the required rate of return. For a given set of cash flows, NPV is maximum when the required rate of return or discounting rate is zero, as it will be simply sum total of all positive and negative cash flows.

- As the required rate of return increases, NPV will go on reducing and will become zero when required rate is equal to IRR. For discounting rates higher than IRR NPV will become negative.

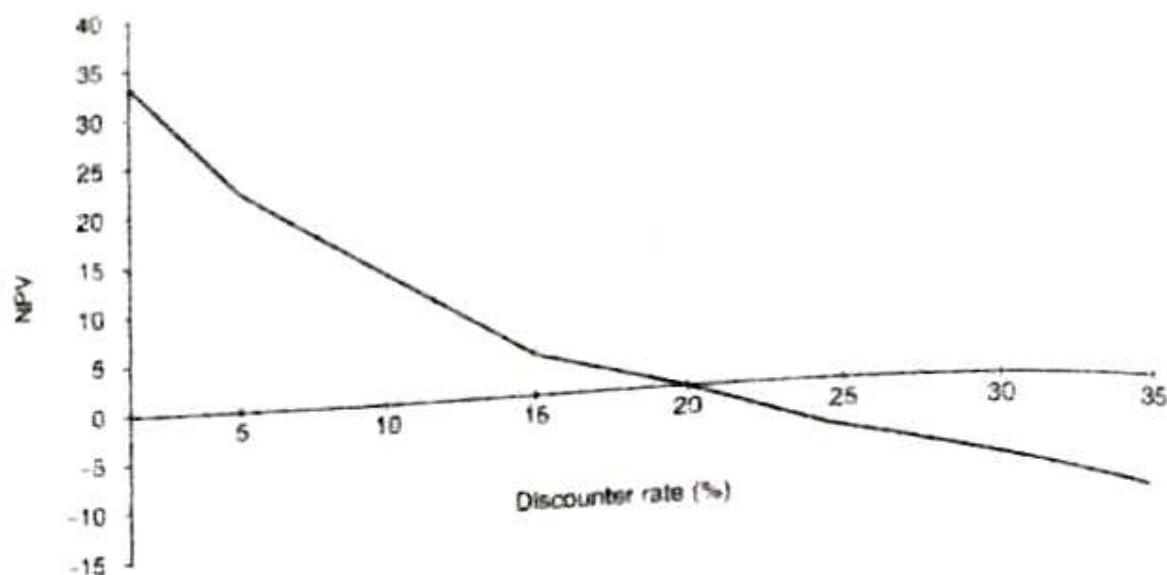


Fig. 5.2.1 : Example of an NPV profile

5.2.7 Modified Internal Rate of Return (MIRR)

Modified Internal Rate of Return (MIRR) is the modification of internal rate of return to overcome two shortcomings of the IRR methodology.

- One shortcoming of the IRR methodology is the assumption that the positive cash flows are invested at the rate of IRR which may not be practical. MIRR assumes that the positive cash flows are reinvested at reinvestment rate, which is taken at the company's cost of capital. Present value of cash flows is calculated using financing.
- IRR formula provides multiple values of IRR in projects involving investment outflows in more than period

➤ Formula : $MIRR = \sqrt[n]{\frac{FVCF}{PVCF}} - 1$

where

FVCF - Future value of positive cash flows.

PVCF - Present value of negative cash flows.

n - No. of periods.

Merits and Demerits of using MIRR method

Merits

- It addresses the shortcomings of IRR, by distinguishing between IRR and reinvestment rate.
- It uses rate of financing for discounting the negative cash flows which reflects the actual cost of funds and may vary for different companies depending on mode of financing. For example, company using debt funding for project will use interest rate as financing rate.
- By comparing MIRR and cut-off or hurdle rate management can take decisions on project selection.

Demerits

- It is more complicated method and difficult to understand for persons without financial background.
- Like IRR it also doesn't provide the value added to the shareholders.

5.2.8 Profitability Index (PI)

Profitability Index (PI) is the ratio of present value of future cash flows and initial cost of the project. Profitability index of more than 1 indicates that company is making money from the project after considering time value money and the project viable. All projects having PI of more than 1 can be selected. In case of mutually exclusive projects, projects having maximum PI are selected.

$$PI = \frac{PV}{CF_0}$$

$$PI = \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \frac{CF_3}{(1+i)^3} + \dots + \frac{CF_n}{(1+i)^n}$$

$$\boxed{\text{Formula : } PI = \sum_{t=1}^n \frac{CF_t}{(1+i)^t}}$$

Example

In the above example involving Rs. 5 Cr investment, Profitability Index will be calculated as below:

$$\begin{aligned}
 PI &= \frac{100}{1.10} + \frac{175}{(1.10)^2} + \frac{225}{(1.10)^3} + \frac{225}{(1.10)^4} + \frac{150}{(1.10)^5} \\
 &= \frac{652}{500} \\
 &= 1.30
 \end{aligned}$$

Acceptance Rule

- Accept the projects where $PI > 1$ or $PI = 1$ and reject the projects where $PI < 1$.
- In case of mutually exclusive projects, one with the highest PI is accepted.

Merits and Demerits of using MIRR method**Merits**

1. PI considers time value of money.
2. PI considers risk associated with the projects.
3. Projects with $PI > 1$ also mean that NPV is positive and add to shareholders' value.
4. PI method can be used for evaluation of projects requiring intermittent cash investments.

Demerit

1. It doesn't provide the value added to the shareholders.

5.2.9 Capital Rationing

A firm keeps on evaluating multiple projects all the time. If a firm has access to unlimited capital, all the investment proposals that are expected to enhance shareholders' value will be selected. However, in practice a firm will have only limited capital for investment, further unchecked capital investment may pose problem of efficient monitoring and management. In such cases, projects that are providing highest return over investment within overall investment cap are chosen. The profitability index is a proxy for the return over investment and can be used to decide on projects in case of capital rationing.

Illustration

Let's take an example, where management only has capital budget of Rs. 10,00,000 and it has evaluated multiple projects with different investment requirements, based on IRR, NPV and profitability index (PI) as below:

Project	Investment	IRR (%)	NPV	PI
A	6,00,000	16	2,40,000	1.40
B	8,00,000	18	2,00,000	1.25
C	4,00,000	18	1,80,000	1.45
D	2,00,000	21	1,20,000	1.70
E	2,00,000	17	1,00,000	1.50

Management can make multiple combinations based on each criterion for projects amounting to Rs. 10,00,000 as below:

Project	IRR	Investment	NPV
D	21	200,000	120,000
B	18	800,000	200,000
A			
TOTAL		1,000,000	320,000

Project	PI	Investment	NPV
D	1.70	200,000	120,000
E	1.50	200,000	100,000
A	1.40	600,000	240,000
TOTAL		1,000,000	460,000

Project	PI	Investment
A	240,000	600,000
C	180,000	400,000
TOTAL	420,000	1,000,000

Profitability index provides combination of projects that maximize returns for given investment and management will choose projects D, E and A.

Note: Use Present Value Interest Factor (PVIF) for discounting the future cash flows and use Compound Value Interest Factor also called Future Interest Factor (CVIF/CVF/FVIF) for calculating future cash flows.

5.2.10 Project Monitoring and Audit

5.2.10(A) Solved Example

Ex 5.2.1 : Management is evaluating options of buying a new welding machine. A new machine of Schumak Machines company has total investment requirement of Rs. 2,50,000 and has net cash flow of Rs. 250,000 for 9 years. An alternative to Schumak is another machine of Honito International costing Rs. 15,00,000 and has cash flows of Rs. 250,000 for 11 years. The required rate of return is 12 percent. Calculate the IRR, NPV and PI of both projects.

Soln. :

(A) Schumak Machines

$$\begin{aligned}
 \text{NPV of Schumak} &= -12,50,000 + 250,000 \times \text{PVA}_{9,0.12} \\
 &= -12,50,000 + 250,000 \times 5.328 \\
 &= -12,50,000 + 13,32,000 = 82,000
 \end{aligned}$$

- IRR of Schumak is equivalent discount at which NPV is nil

$$-12,50,000 + 250,000 \times PVAF_{9,IRR} = 0$$

$$PVAF_{9,IRR} = \frac{12,50,000}{250,000}$$

$$PVAF_{9,IRR} = 5$$

Referring to PVAF table, $PVAF_{9,0.14} = 4.946$

$$\text{and } PVAF_{9,0.14} = 5.132$$

Hence, IRR corresponding to

$$5 = 14\% - \frac{(5 - 4.946)}{(5.132 - 4.946)} = 14\% - 0.29\% = 13.71\%$$

- PI for Schumak = $\frac{PV}{\text{Investment}} = \frac{13,32,000}{12,50,000} = 1.06$

(B) Honito International

- NPV of Honito = $-15,00,000 + 250,000 \times PVAF_{11,0.12}$
 $= -15,00,000 + 250,000 \times 5.938$
 $= -15,00,000 + 14,84,500$
 $= -14,500$

- IRR of Honito is equivalent discount at which NPV is nil

$$-15,00,000 + 250,000 \times PVAF_{11,IRR} = 0$$

$$PVAF_{11,IRR} = \frac{15,00,000}{250,000}$$

$$PVAF_{11,IRR} = 6$$

Referring to PVAF table,

$$PVAF_{11,0.12} = 5.938$$

$$\text{and } PVAF_{11,0.11} = 6.207$$

Hence, IRR corresponding to 5 = $12\% - \frac{(6 - 5.938)}{(6.207 - 5.938)} = 12\% - 0.23\% = 11.77\%$

- PI for Honito = $\frac{14,84,500}{15,00,000} = 0.98$

From the comparison of the two proposals, we understand that Honito's NPV is negative hence IRR less than cost of capital and PI is less than 1. Hence, Honito is rejected.

Review Questions

Q1 Explain the importance of capital budgeting decisions.

Q2 Explain the difference between internal rate of return and accounting rate of return.

Q3 Explain the merits and demerits of payback period methodology for capital budgeting?

Q4 What are the shortcomings of IRR methodology?

Q5 List different capital budgeting and explain why NPV methodology is the most appropriate capital budgeting technique.

6

Working Capital Management

Syllabus

Working Capital Management : Concepts of Meaning Working Capital; Importance of Working Capital Management; Factors Affecting an Entity's Working Capital Needs; Estimation of Working Capital Requirements; Management of Inventories; Management of Receivables; and Management of Cash and Marketable Securities.

We have heard many times the phrases like 'Cash is king' meaning those who have cash are the kings or 'Aaj Nagad Kal Udhari' meaning we don't sell on credit. These phrases signify the importance of current asset and style of managing working capital management of firms. We will study the various components of working capital management.

Learning Objectives

- Working Capital - concept, meaning, important of working capital management
- Operating cycle, types of working capital, factors affecting working capital
- Management of inventory
- Management of receivables
- Management of cash and marketable securities.

6.1 Introduction to Working Capital Management

- In the normal course of business, a firm need to hold a stock of goods to fulfil sales requirements in timely manner; provide credit period to customers and maintain cash balance to meet payments.
- This requirement to hold investment in current assets leads to large portion of a firm's assets locked in current assets. Hence, it's important to study the management of working capital. There are two major concepts of working capital.
 1. Gross working capital
 2. Net working capital.

6.1.1 Concept of Gross Working Capital and Net Working Capital

- **Gross working capital** refers to the total of current assets involving inventory (also known as stocks), debtors (also known as account receivables), cash and marketable securities.
- **Net Working Capital** refers to the difference between current assets and current liabilities and is reflects the amount of funding needed to finance working capital. Current liabilities here include payables to the suppliers.
- The requirement of working capital depends on the operating cycle of the company. Hence, to understand working capital better, we need to first understand the concept of operating cycle.

6.1.2 Operating Cycle

- Operating cycle refers to time period elapsed between the time of purchase of raw materials to realisation of cash from selling the goods or services by the firm.
- Operating cycle consists of many activities such as purchase of raw materials, conversion of raw material into WIP or work in progress, conversion to WIP to finished goods, sale of finished goods and collection of cash from customers, post-sale.
- The time period from purchase of raw material to sale of goods is the inventory conversion period for the company.
- The time period from sale of goods to collection of cash is the debtor conversion period. The average inventory conversion period of the company is also called inventory days and the average collection period as debtor days, as calculated in financial ratio analysis.

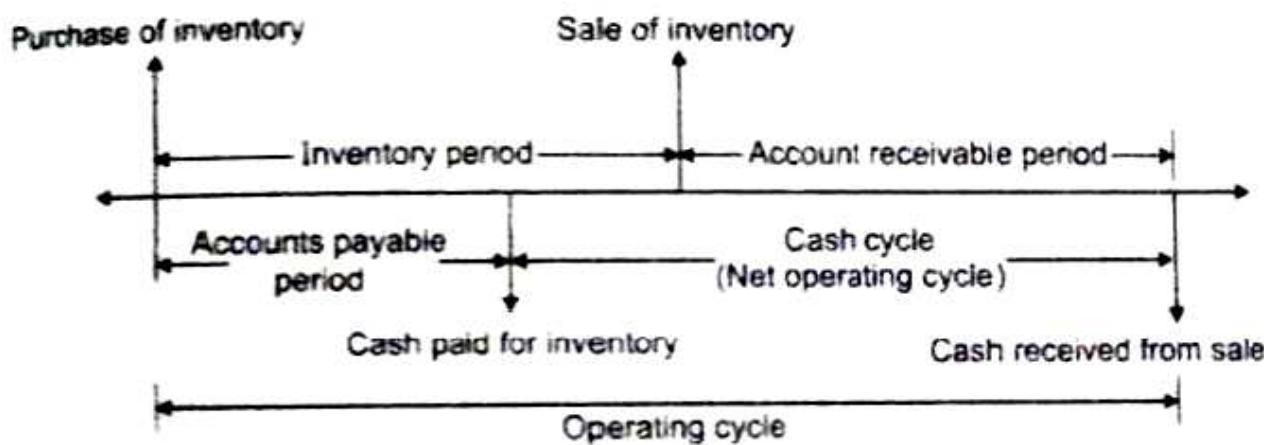


Fig. 6.1.1

$$\text{Operating Cycle} = \text{Inventory Conversion Period} + \text{Debtor Conversion Period}$$

Inventory conversion period consists of raw material conversion period

OR

$$\text{Operating Cycle} = \text{Inventory Days} + \text{Debtor Days}$$

$$\text{Operating Cycle} = \frac{360}{\frac{\text{Cost of goods sold}}{\text{Average Inventory}}} + \frac{360}{\frac{\text{Credit Sales}}{\text{Average Debtors}}}$$

- In practice, many firms purchase raw materials on credit and get time for payment, also referred to credit period. Hence, the cash blocked in current assets will not be blocked for the entire operating cycle. **Cash cycle or net operating cycle refers to the time period from payment of cash for purchase of raw materials to the realisation of cash from sale.**

- The cash cycle is calculated using following formula :

$$\text{Cash Cycle} = \text{Inventory Conversion Period} + \text{Debtor Conversion Period} - \text{Creditors Deferral Period.}$$

$$\text{Cash Cycle} = \text{Inventory Days} + \text{Debtor Days} - \text{Account Receivables Days.}$$

6.1.3 Importance of Working Capital Management

- Current assets form a significant portion of the total assets of a firm. In case of trading firms, working capital contribution is very high and may contribute to even 80-90% to total assets.
- Current assets such as short term investments provide lower returns compared to fixed assets. Inventories and debtors don't provide any direct returns. Hence large investment in current assets can result in sub-standard return on investment.
- Excessive accumulation of inventory can result in problem of non-moving inventory and may lose value in future. Large account receivables may pose problems of collection and in some cases result in loss due to non-collection.
- On the other hand, low level of current assets can lead to delay in fulfilment of orders and may lead to temporary loss of business. This may also result poor utilization of fixed assets.
- Inadequate current assets can lead to inefficiencies in day to day operations and can lead to higher cost and affect profitability and competitiveness of the company.
- Shortage of liquid current assets can lead to delay in repayment to operational and financial creditors and loss of reputation. Continued shortage of current assets can exacerbate these problems and may even also lead to bankruptcy if company cannot arrange financing in time to meet obligations.
- Efficient working capital management is required to maintain balance between return on investment and optimum liquidity for smooth operations of the company. Working capital management requires day to day monitoring of current assets to ensure smooth business operations and occupies large portion of finance manager's mindshare.

6.1.4 Permanent and Variable Working Capital

- A company needs to maintain adequate level of current assets for smooth running of the business. However, the amount of current assets is not constant and keeps changing depending on the seasonal factors. Current assets of the company have two components i.e. permanent or fixed working capital and Variable (temporary or fluctuating) working capital.
- Permanent or fixed working capital** refers to the minimum amount of current assets required by the company. Permanent working capital is akin to fixed asset investment, as it will remain fixed for long term. Further as in case of fixed assets company may need to increase permanent working capital gradually with growth in sales.
- Temporary or fluctuating working capital** refers to the additional current assets required due to seasonal requirements. For example, a company needs to stockpile large finished goods to meet demand in peak season and will have current assets. The temporary working capital amount keeps fluctuating depending on the seasonal requirement. In the peak season, temporary working capital will be high while in slack season it will be non-existent.

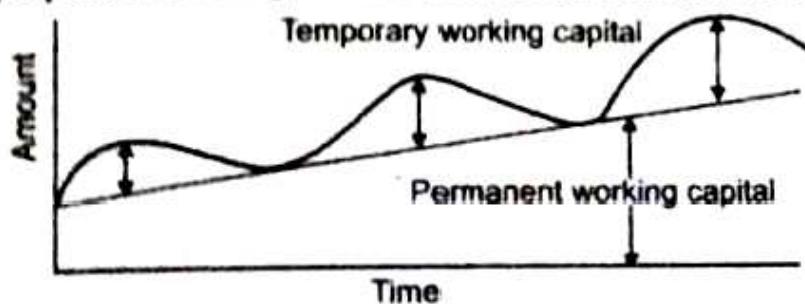


Fig. 6.1.2

6.1.5 Factors Affecting Working Capital Needs

- 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.
- 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.

- **Cyclicalities :** 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.

6.1.6 Issues in Working Capital Management

Working capital management involves decision on following two areas:

- 1 Optimum level of current assets and
- 2 Financing mix between short term and long term financing.

Optimum working capital - Trade off

- Investment in current capital generally provides low return on investment, hence to maximize returns minimum amount of current assets should be maintained. On the other hand, insufficient current assets can lead to risks of default on payment obligations and loss of sales. Hence, in determining appropriate level of current assets, a trade-off between profitability vs liquidity must be considered.
- To illustrate this trade-off let's consider 3 alternative working capital policies, prescribing use of different levels of current assets for achieving same output. The relationship between output and current assets is as depicted in the below chart.
- The requirement of current asset increases with increase in output however the relationship between current assets and output is not linear. Current assets increase at slower pace at higher level of output. This is due to improved operating efficiency at higher level of output.
- Policy A has the highest investment in current assets for a given output. As current assets are also proxy for the liquidity, policy A can be considered as the most conservative. Policy C has the lower level of current assets, meaning lowest liquidity and can be considered as the most aggressive, while policy B is average. How do the policies compare in term of profitability calculated using return on investment (ROI)?

$$\text{ROI} = \frac{\text{Net Profit}}{\text{Total assets}}$$

$$= \frac{\text{Net Profit}}{\text{Current assets} + \text{Non-current assets}}$$

- If company can maintain level of sales while reducing the level of current assets, the policy C having lowest level of current assets will have the highest ROI or profitability, while conservative policy A having highest level of current assets, will have lowest profitability. However, with increase in profitability company also faces higher risks i.e. delay in payment obligations due to lower cash, lost sales due to lower stock and dissatisfied customers due to lower credit period etc.
- Thus we can conclude that profitability and liquidity are inversely related to each other and increase profitability or return is associated with higher risk.

- Hence, management need to carefully manage this trade-off between profitability and liquidity risk and return, while deciding on the optimum level of current assets.

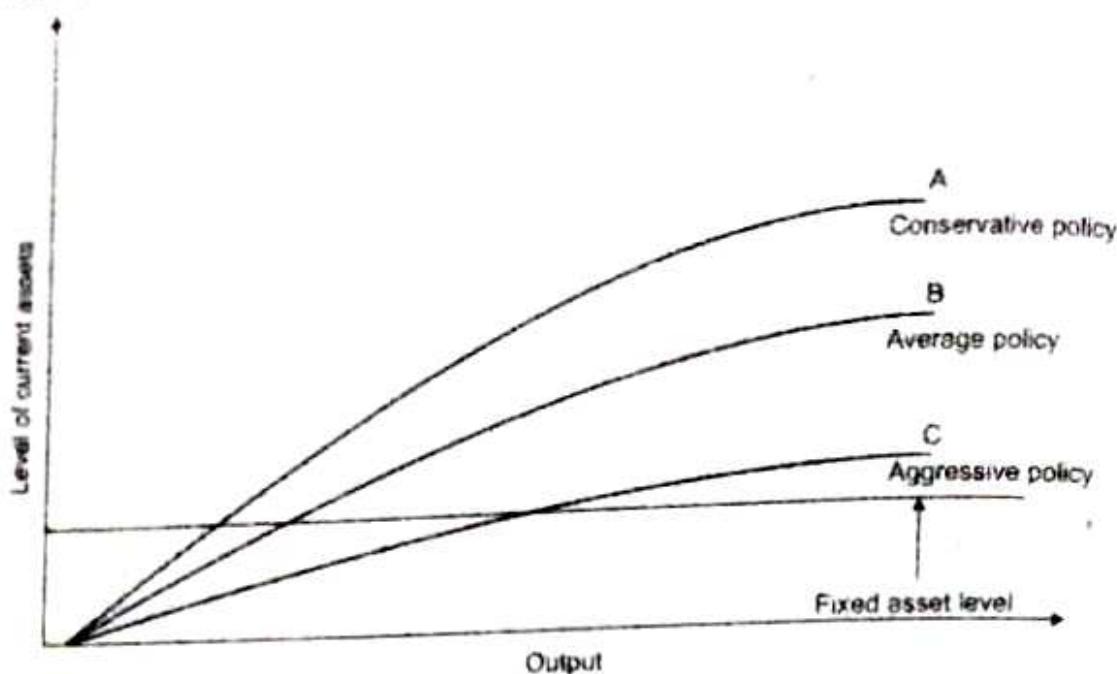


Fig. 6.1.3 : Chart

Mix of short term and long term financing

Generally, interest rates on short term funding are lower than long funding. Further, short term debt can be repaid back during the times of lower requirement. Hence higher the proportion of short term debt, lower the interest cost and higher the profitability.

6.1.7 Estimation of Working Capital Requirement

Operating cycle of a company provides most appropriate methodology to calculate the working capital requirement. However, in practice other methods are also be used. Three important methodologies to estimate working capital requirements are as follows :

- 1. Current assets holding period :** This method is derived from operating cycle concept and involves calculation of working capital based on holding period of individual current assets.
- 2. Ratio of sales :** In this method current assets as a percentage of sales is estimated based on assumptions and past experience and accordingly current assets are calculated. This is most commonly used method in practice as it assumes the requirement of higher working capital with increase in sales and is easier to use.
- 3. Ratio of fixed investment :** In this method current assets as a percentage of fixed assets is estimated and accordingly current asset amount is calculated. This method is not used often in practice.

Let's take an example to illustrate above methods of working capital estimation.

Amount in Rs. Lakh	2020
Material Cost	
Raw Materials Consumed	36,000
Manufacturing Cost	
Labour	12,000
Power and Fuel	10,000
Factory Overheads	7,500
Other Expenses	1,500
Depreciation	5,000
Annual Sales	108,000
Fixed Assets Investment	75,000
Finance Costs	1,000
Profit Before Tax	4,500
Total Fixed Assets	25,000
Profit After Tax	3,375

Assumptions for calculating working capital under each method is as follows :

Method 1: Inventory : 1 month supply raw materials and 15 days supply of finished goods.
 Debtors : 1 month, Operating Cash: 1 month of total cost.

Method 2 : 20% of annual sales.

Method 3 : 40% of fixed asset investment.

Method 1 Calculation :

$$\text{Raw materials inventory} = \frac{36,000}{12} = \text{Rs. 3,000 Lakh}$$

$$\begin{aligned}\text{Finished Goods Inventory} &= \frac{\text{Total cost}}{24} \\ &= \frac{36,000 + 12,000 + 10,000 + 7,500 + 1,500 + 5,000}{24} \\ &= \frac{72,000}{24} \\ &= \text{Rs. 3,000 Lakh}\end{aligned}$$



$$\text{Debtors} = \frac{\text{Annual Sales}}{12} = \frac{108,000}{12} = \text{Rs. 9,000 Lakh}$$

$$\text{Cash balance} = \frac{\text{Total Cost}}{12} = \frac{72,000}{12} = \text{Rs. 3,000 Lakh}$$

$$\begin{aligned}\text{Total Current Assets} &= \text{Raw material inventory} + \text{Finished goods inventory} + \text{Debtors} \\ &\quad + \text{Cash balance} \\ &= 3000 + 3000 + 9000 + 3000 \\ &= \text{Rs. 18,000 Lakh}\end{aligned}$$

Note : In cases where semi-finished goods or WIP inventory also need to be calculated, add direct labor, power and fuel expenses and maintenance if provided to raw material consumption for estimating cost of semi-finished goods.

Method 2 :

$$\begin{aligned}\text{Current Assets at 30% annual sales} &= 108,000 \times \frac{30}{100} \\ &= \text{Rs. 32,400 Lakh}\end{aligned}$$

Method 3 :

$$\begin{aligned}\text{Current Assets at 40% of total fixed asset investment} &= 75,000 \times \frac{40}{100} \\ &= \text{Rs. 30,000 Lakh}\end{aligned}$$

In the previous sections, we discussed the importance of working and process for estimation of current assets. Now let's understand the techniques to manage current assets i.e. management of inventories, management of receivables, management of cash and marketable securities.

6.2 Management of Inventories

Inventory forms probably the largest portion of current assets of manufacturing and trading companies. Trading companies need to hold finished goods inventory for timely fulfillment of customer requirements and loss of customers. Manufacturing companies also need to hold raw materials and Work in Progress (WIP) inventory in addition to finished goods. While raw materials inventory is required to ensure smooth production, WIP inventory arises due to production cycle.

The main objectives of holding inventory can be categorized as below:

1. **Transaction motive :** Transaction motive is the main objective of holding inventory. It involves holding inventory to ensure smooth production and supplies for sales activity. Inventory is held depends on many factors such as the production capacity, demand etc.

2. **Precautionary motive :** According to this motive, businesses hold inventory to guard against unforeseen and unpredictable events leading to disruption in production or supply of materials.
3. **Speculative motive :** Under this motive, businesses hold inventory or reduce to take advantage the price movement. For example, retailers may stock up certain goods in anticipation of price increases, while manufacturers may stock up raw materials if the prices have fallen.
4. **Other motives :** These include motives such as availing discounts associated with bulk purchases, reduce ordering cost etc.

6.2.1 Inventory Management Techniques

- 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?

6.2.1(A) Economic Order Quantity (EOQ) (How much to Order?)

- 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 $\frac{Q}{2}$

Total carrying cost (TCC) = Carrying cost per unit \times Average inventory

$$TCC = \frac{Q \times c}{2}$$

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 :

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

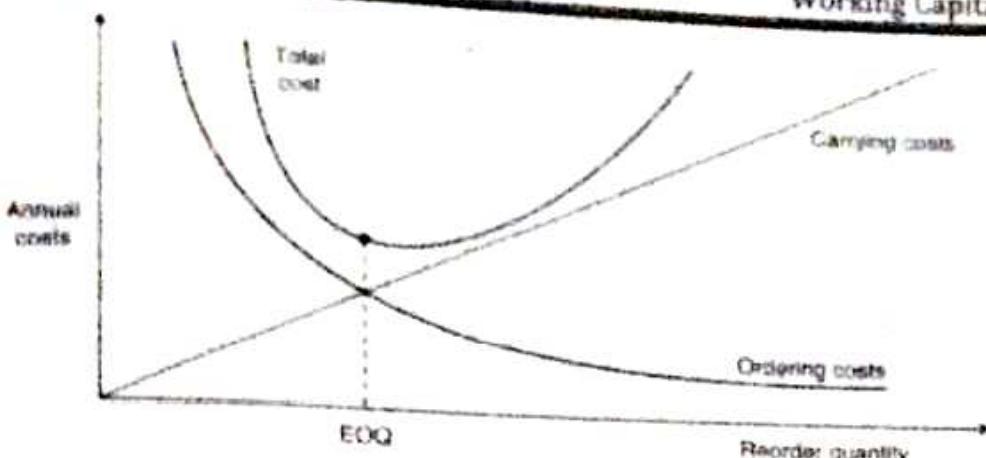


Fig. 6.2.1

- 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.

6.2.2 Inventory Control Systems

Control and management of inventory is a complicated task, hence a firm need to have formally monitored inventory control system suitable with its scale of operations. The most popular inventory control systems are as mentioned below:

6.2.2(A) ABC Method of Inventory Control

- A manufacturing firm needs to maintain inventory of a variety of items depending on the product. In some cases, like automobile firms, the number of items can be in thousands of parts depending on models. However, most of the total inventory value is typically accounted by relatively small proportion of items. It advisable for the firm to focus more attention in controlling the more valuable items.
- This is accomplished by using ABC method of inventory control. In this method inventory items are classified in A, B and C categories.
- Category A items are most valuable and account for majority of inventory value. These items are monitored strictly and more frequently.
- Category B items account for lower portion of total inventory value and involved moderate control and monitoring.
- Category C contains large number of items, even smaller portion of inventory value and hence involve minimal monitoring. For the firm described by below Fig. 6.2.2, "A" items reflect the fact that roughly 15 percent of the items in inventory account for 70 percent of inventory value.
- The next 30 percent of the items, group "B," account for 20 percent of inventory value And more than half, or 55 percent, of the items explain only 10 percent of total inventory value

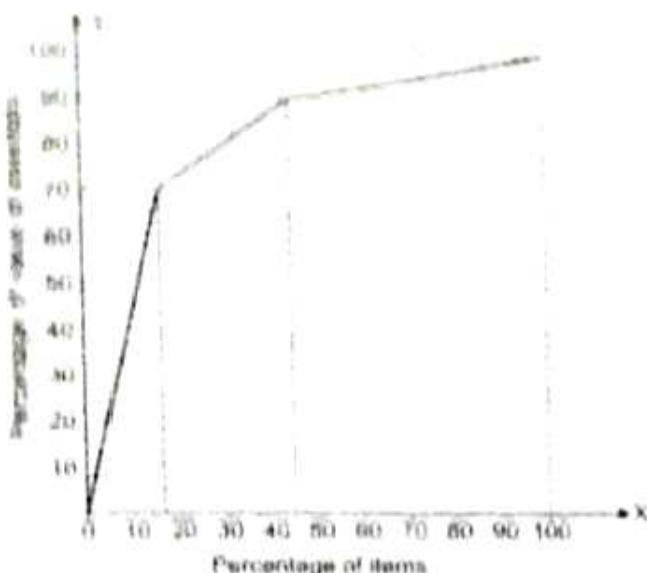


Fig. 6.2.2 : Graphic presentation of ABC analysis

6.2.2(B) Just In Time (JIT)

- just in time (JIT) also known as Toyota production system was pioneered by Toyota Corporation in 1970. As the name implies JIT aims to maintain just enough inventory needed at the time of manufacturing.
- In JIT system of inventory management, management aligns raw-material orders with their production schedules.
- It helps them to increase efficiency, decrease waste and reduce inventory cost by receiving goods only as they need them for the production process, which reduces inventory costs.
- JIT requires a very accurate production and inventory information system and very efficient and reliable chain to succeed.
- JIT prescribes ordering quantities just as needed, which seems to suggest that JIT will suffer from very high ordering costs.
- In real world, JIT is also accompanied with steps taken to reduce ordering costs by reducing inspection, logistics costs by developing highly efficient supplier base. Otherwise it can cause stock outs and increased costs associated with last minute arrangements and defeat the purpose of JIT. In practice, large firms use highly sophisticated Supply Chain Management (SCM) systems, which help in production scheduling, estimate requirement of each item and ordering system.
- A financial manager is not directly involved in the management of inventories. Due to relatively large investment of funds in inventory, finance manager must be aware of inventory management and control techniques.

- The greater the opportunity cost of funds invested in inventory, the lower the optimal level of average inventory and the lower the optimal order quantity, all other things held constant.
- The lower the average lead time, the lower the safety stock needed, and the lower the total investment in inventory, all other things held constant. To reflect change in cost of capital, carrying cost need to be adjusted higher or lower. Accordingly, EOQ value will also become lower.

6.3 Management of Receivables

- 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 a 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 :
 - Credit Policy
 - Credit Evaluation and Decision
 - 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 investment in receivables. Credit terms having cash discount and credit period will be stated as 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.

- The same can be followed by email from senior members of collection team, letters and personal visits and legal notice if required. Direct legal action is generally costly and may not serve the real purpose of collection. When payments cannot be collected, a compromise settlement can be made to collect a percentage of total due amount.

6.3.2 Trade-off

- Goal of any credit policy is maximization of shareholders' wealth by maximizing operating profits from increase in sales. Any change in credit policy need to be decided after weighing in cost-benefit analysis.
- Management need to consider a trade-off between the returns from additional sales or lost sales vs additional cost or savings due to increase or decrease in receivables, impact on bad debts etc. The below chart explains the trade-off between tight and loose credit policy.

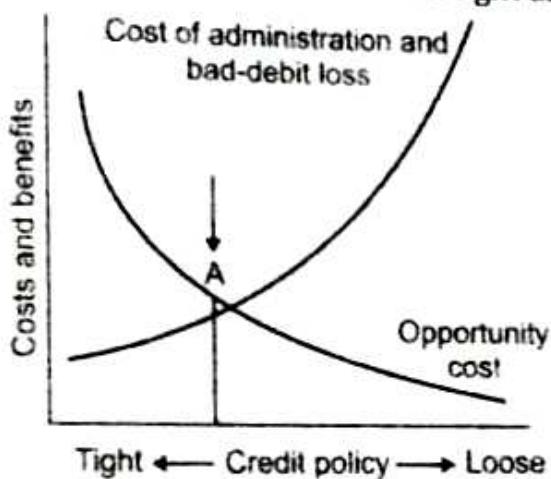


Fig. 6.3.2

Let's take an example.

Illustration - Change in credit standards

A firm is selling product for Rs. 100 per unit, of which Rs. 80 represents variable costs before taxes. Currently, annual credit sales to select customers are at a level of Rs. 240 Lakh and credit terms include credit period of 1 month. The relaxation in credit standards is expected to increase sales to Rs. 300 Lakh annually. Current bad debt ratio is 2%, which is expected to increase to 3%. Rate of tax is 25% and post-tax opportunity cost of carrying additional receivables is 20%.

Let us evaluate the trade-off between the expected additional profitability due to the additional sales and the opportunity cost of the increased investment in receivables.

- Contribution from additional sales = Contribution margin × Additional sales

$$= \frac{100 - 80}{100} \times 60 = 0.20 \times 60 = \text{Rs. } 12 \text{ Lakh.}$$
- Additional cost due to increase bad debt losses = increase in bad debt loss on existing sales + bad debt on additional sales = $3\% - 2\% \times 240 + 3\% \times 60 = 2.4 + 1.8 = 4.2 \text{ Lakh.}$



- Net change in operating profit = Higher Contribution - Additional Cost = $12 - 4.2 = 7.8$ Lakh
- After tax change in operating profit = $7.8 (1 - 0.25) = \text{Rs. } 5.85$ Lakh
- Additional receivables = $\frac{60 \times 1}{12} = \text{Rs. } 5$ Lakh.
- Investment in additional receivables = Expense ratio \times Additional receivables
 $= 0.8 \times 5 = 4$ Lakh.
- Required Return on investment = Cost of capital \times Additional investment = $0.2 \times 4 = 0.8$ Lakh.
 Profitability from additional sales is substantially higher than the required return on additional investment, hence it is advised to provide to additional customers.

Illustration 2 - Change in credit terms

Let's assume in the above firm has an option to increase credit period for existing customers to 60 days, which is expected to result an increase in sales from Rs. 240 Lakh to Rs. 360 Lakh. Current bad debt ratio is 2%, which is expected to increase to 4%. Rate of tax is 25% and post-tax opportunity cost of carrying additional receivables is 20%.

Let's evaluate the trade-off based on proposed change in credit terms

- Contribution from additional sales = Contribution margin \times Additional sales
 $= \frac{20}{100} \times 360,00 - 240,00 = 0.20 \times 120,000 = \text{Rs. } 24$ Lakh.
- Additional cost due to increase bad debt losses = $1\% \times 240 + 4\% \times 120 = 7.2$ Lakh.
- Increase in operating profit = $24 - 7.2 = 16.8$ Lakh.
- After tax change in operating profit = $16.8 \times 1 - 0.25 = \text{Rs. } 12.6$ Lakh.
- Investment in additional receivables associated with new sales = $\frac{\text{Variable cost}}{\text{Selling price}} \times \text{Additional sales} \times \frac{\text{Credit period in months}}{12} = \frac{80}{100} \times 120 \times \frac{2}{12} = 0.80 \times 120 \times \frac{2}{12} = 16$ Lakh.

Investment in additional receivables associated with change in credit period on existing sales
 $= \frac{\text{Variable cost}}{\text{Selling price}} \times \text{Existing sales} \times \frac{\text{Additional credit period in months}}{12}$
 $= 0.80 \times 240 \times \frac{1}{12} = 16$ Lakh.

- Total increase in receivables = Rs. 32 Lakh.
- Expected return at 20% = $0.20 \times 32 = \text{Rs. } 6.4$ Lakh.

After tax change in operating profit is higher than the expected return, hence, the trade-off is favourable.

6.3.3 Evaluation of Individual Account for Credit

Before offering credit terms to any customer, company should perform credit evaluation of individual customer. The credit evaluation involves following steps :

1. Credit Information
2. Credit Analysis
3. Credit Decision and Credit Limit

6.3.3(A) Credit Information

The first step for credit evaluation is to obtain credit information. Commonly used sources of credit information in India are as follows :

Financial statement : Financial statements are one of the most sources of financial position of the company. In India public limited companies and private limited companies are required to file financial statements with the registrar of companies. These can be accessed by the firm planning to grant credit for payment of certain fees. In addition, there are some third party providers that provide the financial information in more user friendly format. Company can use this information. In case of proprietorship, partnership firms financial information is not publicly available, company need to seek the financial information from the customer willing to avail the credit.

Trade references : Company can ask customers to provide reference of other parties having trade relationships. Company can check from these references track record of the customers. This is an easy and free resource for checking credit worthiness.

Credit rating : Companies can check the credit rating of the customers if available. Credit rating are the ratings on the credit worthiness provided by third party credit rating agencies such as Dun & Bradstreet, CRISL, ICRA etc. These are used by companies to avail financing, but may not be available for all customers.

Past track record : Company can check the record of past dealings for existing or old customer.

6.3.3(B) Credit Analysis

Having collected credit information, the firm must make a credit analysis of the applicant. Ratio analysis of financial statements, credit rating etc. are used to understand repayment capacity. Information on management of the customer and trade reference can be used understand reputation of the customer. Some companies have developed internal credit scoring system based on financial ratio analysis, management analysis, past payment track etc. to decide on credit worthiness.



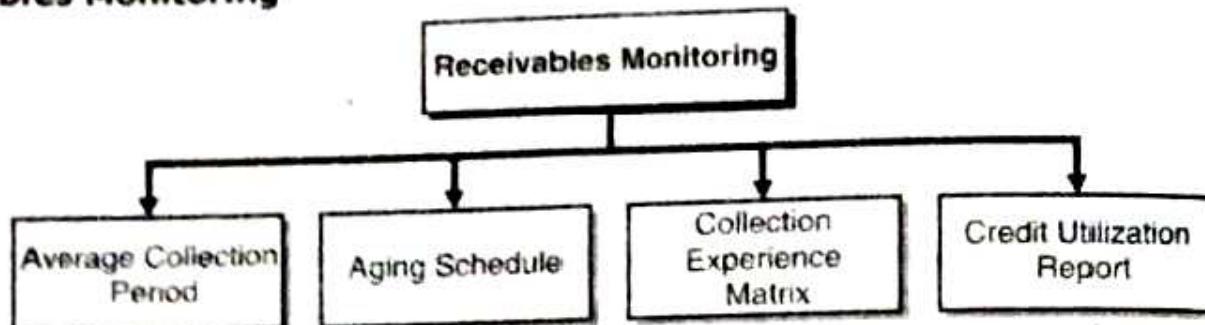
6.3.3(C) Credit Decision and Credit Limit

Once credit analysis, a decision must be reached about the grant of credit. The decision to grant the credit can be for a single transaction or a company can set a credit limit for a customer, which represents a maximum limit on the amount the firm will permit to be owed at any one time.

6.3.4 Monitoring of Receivables

A firm needs to regularly monitor the receivables to ensure that the receivables are getting collected as per the credit term and minimize the bad debt losses. Following methods of monitoring of receivables are commonly used.

Receivables Monitoring



6.3.4(A) Average Collection Period (ACP)

- In this method, firm computes the average collection period of credit sales and compares the same with the credit policy.

$$\text{Average Collection period (ACP)} = \frac{\text{Debtors} \times 360}{\text{Credit Sales}}$$

- Average collection period is compared with the credit period as per the policy to judge the efficiency of collection policy. If the average collection period is more than the credit period as per the policy, then the collection policy and efforts need to be improved.
- The above method provides an overall picture of the efficacy of collection efforts. However, average collection period suffers from lack of specific details on amounts that are due for longer than average period to take action.
- The early paying accounts can mask performance of slow paying accounts. Impact of seasonal variations in sales on the collection period is not factored in.

6.3.4(B) Aging Schedule

- In this method, receivables are classified into different bands of aging or aging buckets. Aging refers to the length of time for which receivables are outstanding.

- The aging analysis provides a clearer picture of the slow moving accounts and provide early alarms on risk of default. Following is the aging schedule of receivables having credit period of 30 days.
- The average collection period may be close 35 days. However, the table shows 6% amount outstanding for more than 45 days and 3% of the amount is outstanding for more than 60 days, which may pose risk for collection. Aging schedule provides an idea about the amount at risk of default and help take remedial actions.
- Aging schedule does not compare the receivables with the sales.

Aging (Days)	Outstanding	Percentage
0-30	5,00,000	61
31-45	2,50,000	30
46-60	50,000	6
61 and above	25,000	3
Total	8,25,000	

6.3.4(C) Collection Experience Matrix

In this technique, receivables arising from the sales are plotted against the sales of period. This helps to compare collection experience of receivables with the sales of the same period. In the collection experience matrix sales are plotted horizontally and receivables are shown horizontally. Following table shows an example of collection experience matrix

Amount in Rs. Lakhs	Months	January	February	March	April
Sales		6000	6000	7500	5000
Receivables					
	January	3500			
	February	2000	3500		
	March	1000	2500	5000	
	April	500	1500	3000	4000
	May	200	500	2000	2500
	June	200	0	1000	2000



The receivables are also expressed as a % sales.

Amount in Rs. Lakhs	Months	January	February	March	April
Sales		6000	6000	7500	5000
Receivables %					
	January	58%			
	February	33%	58%		
	March	17%	42%	67%	0%
	April	8%	25%	40%	80%
	May	3%	8%	27%	50%
	June	3%	0%	13%	40%

6.3.4(D) Credit Utilization Report

In this report, details of the total limit of credit offered to each customer and the extent to which it is utilized is plotted and reviewed on periodical basis. This provides the information on the extent to which total limits being utilized.

Customer	Credit Limit (Rs. Lakh)	Limit Utilized (Rs. Lakh)	% Utilization
A	2000	1500	75
B	1500	1400	93
C	1000	800	80
Total	4500	3700	

6.3.5 Sale of Receivables/Factoring

- Assignment or sale of receivables is one of the most commonly used methods for realisation of early payment and reduce receivables. In this transaction, company sells its receivables to banks or specialised financial institutions.
- This transaction is called Factoring or assignment of receivables. There are specialised financial institutions who engaged in purchase of receivables called as Factors.
- A Factor or bank deducts discount and factoring charges from the receivables amount and pays the balance amount to the company.
- On the due date Factor collects the money directly from the customers. In a typical factoring transaction, to mitigate risk of default or delay, factors require companies to compensate them up to a fixed percentage of receivables.

For example, a company having some outstanding receivables of Rs. 500 Lakh due after 60 days can enter into a factoring transaction with a Factor or a bank.

The bank will deduct discount charges of say Rs. 12 Lakh (about 2.4%) and pay Rs. 488 Lakh to the company. On due date, the bank or factor will collect the payment directly from the customer.

6.4 Management of Cash and Marketable Securities

Cash is probably the least productive asset among current assets, as idle cash does not generate any return. Even in cases where cash is invested in the bank deposits or short term marketable securities returns are generally much lower than cost of capital. However, it is probably most critical in many aspects, as it used to meet payment obligations. We have seen trends of growing cash balances on the balance sheets. This can be attributed to many reasons such as increasing uncertainties, shortened business cycles, rapid disruption in business and black swan events like global financial crisis of 2008, demonetization, pandemic like COVID 19 etc.

6.4.1 Motives for Holding Cash

Companies hold sufficient cash balance for various reasons. There are three major motives for holding cash

- **Transaction Motive :** In the normal course of business, company need to make various such as purchase of goods, salaries to employees, utility payments, instalment of loans, interest expenses, dividend etc. Company also receive cash from sale of good, however the need to hold cash arises because the timing mismatches between cash receipts from sale and expenses. This is motive for holding the cash in transaction motive. Company can choose to maintain cash for immediate payments and balance in the marketable securities and time the conversion of securities to cash with the payments.
- **Precautionary Motive :** A firm may hold cash to meet contingencies of the future. These amounts to guard off against unexpected fund requirements. These may arise due to sudden sharp fall in sales or higher than expected payments etc. As these funds may not be required in normal course company can invest such funds in liquid marketable securities such as short term fixed deposits, money market mutual funds. If the company has an access to short term funds or unutilized credit lines etc. it can choose to borrow the funds instead of holding the cash.
- **Speculative Motive :** Sometimes companies hold cash to take advantage of investment opportunities such as advance material purchase in anticipation of fall in input prices, holding funds to invest in marketable securities or borrowing and holding cash in anticipation of rise in interest rates in near future. Speculative motives are generally not common.



6.4.2 Cash Management Process

The cash management process involves the management of cash and cash equivalents; these includes marketable securities that can be liquidated into cash quickly. Cash management is concerned with collection of cash, payment of cash, financing short term deficits and investment of cash surplus. Following picture captures, the cash management process.

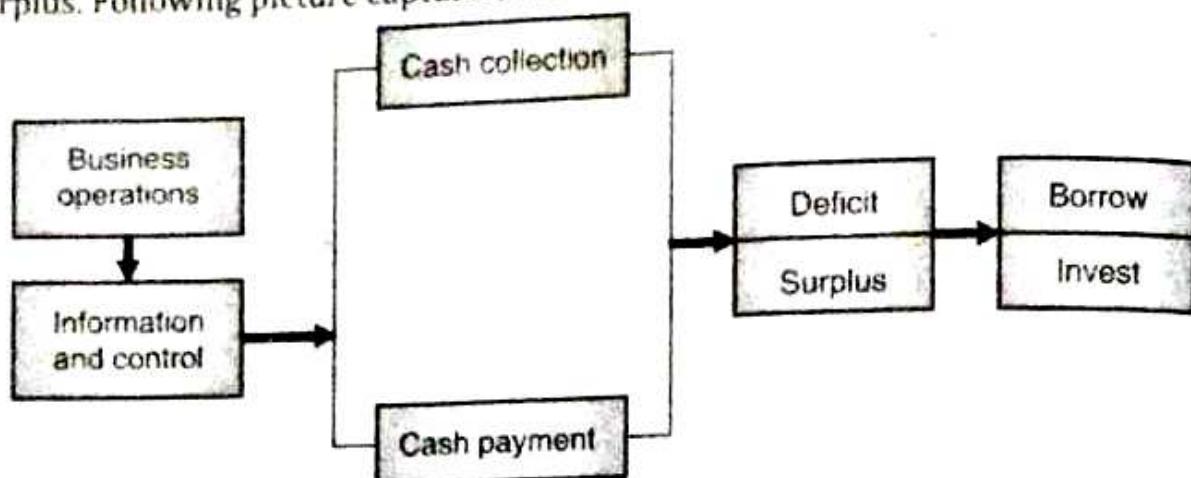


Fig. 6.4.1 : Cash management cycle

Cash management process consists of following steps

1. Forecasting cash flows
2. Managing cash collections and disbursements
3. Investment in marketable securities

6.4.2(A) Forecasting Cash Flows

- This is the starting point of the cash management process. Cash forecasting is done for various periods. Companies prepare cash forecast for daily, weekly, monthly, quarterly and annual period and these are considered short term forecasts also called as cash budget.
- Cash budget helps company
 1. To determine requirement of operating cash
 2. Plan and negotiate short term borrowings
 3. Invest surplus cash
- Accurate cash forecasting can help company to prioritize payments, borrowings, minimize idle cash and borrowings.
- Long term cash flow forecasting of 3 to 5 years helps in finalizing financing and investment strategies.
- **Daily, weekly and monthly cash budget** are prepared by forecasting all the receipts and disbursements (payments). The receipts consist of cash inflows from operating and non-operating activities.

Operating activities consist of collections from business activities such as sales and services while non-operating cash inflows consist of other collections such as rental income, interest income, income from sale of asset such as land, building etc. Disbursals consist of all the outflows such as payments to be made for

- (i) Operating activities such as purchase of material, taxes, salaries, overheads etc.
- (ii) Non-operating activities such as capital expenditure, interest payment, principal repayment of long term loans etc.

The difference between receipts and disbursals is the net cash shortfall or surplus. Following is an example of monthly cash budget of company having 90% sales on credit and 10% on cash. Company collects 80% of credit sales in next month and 20% in the month after. Further, company also buys raw materials on credit with credit period of 30 days. So the purchase of the current month is paid in next month.

Amount in Rs. Thousands	February	March	April	May	June	July	August	Sept
Total Sales	375	525	450	525	375	300	375	450
Credit sales @90%	338	473	405	473	338	270	338	405
Cash sales	38	53	45	53	38	30	38	45
Receipts/collections								
Cash sales, current month			45	52.5	37.5	30	37.5	45
80% of last month's credit sales				378	324	378	270	216
20% of 2-month old credit sales					67.5	94.5	81	94.5
Total sales receipts				491	471	497	395	321
Purchases	225	315	270	315	225	180	225	270
Disbursement for purchases and other operating expenses								
100% last month purchases				315	270	315	225	180
Salaries and Wages					45	52.5	37.5	30
Other expenses					45	52.5	37.5	30
Total Operating disbursals				405	375	390	285	255
Capital expenditure					50	75		
Advance tax						45		37
Total Cash disbursal				405	425	510	285	255
Net cash flow				86	46	-14	110	66
Beginning cash balance				150	236	282	268	378
Total cash				236	282	268	378	444
Borrowing				-	-	-	-	-
Interest on borrowings				-	-	-	-	-
Repayment of borrowing				-	-	-	-	-
Closing cash balance				236	282	268	378	461

- **Long term cash forecasting** involves preparation of cash flow statements using **adjusted net income method**. It is a projected cash flow statement prepared using forecasted profit and loss.
- Net profit, depreciation, interest etc. are used from the projected profit and loss statement. Capital expenditure is taken from the capital budget. The working capital changes are estimated using ratio of working capital to sales in the past and the same is extrapolated for future periods. Long term cash forecast is made for 2 to 5 years. Long term cash forecast is used for estimating financing requirements in the future and finalize financing strategies.

6.4.2(B) Managing Cash Collections and Disbursements

Finance manager need to carefully manage cash flows in accordance with the cash budget. Finance Manager need to prioritize or accelerate the collections and delay or postpone cash disbursals wherever feasible.

1. Accelerate Cash Collection

- The firm will like to speed up collection of accounts receivable so that it can use the cash earlier to make payment or conserve for future payments. Some of the methods to speed up the collections are
 1. Expedite preparing and mailing of the invoice.
 2. Reduce time for collection of payment instruments from customers – This helps to reduce mail float i.e. the time taken by the customer cheques to reach the firm.
 3. Reduce the time for processing the payment – The time required for processing the payments internally as well as with the bank is called as processing float. Company needs to expedite the processing of collected cheques or payment instruments to reduce the processing float. The mail float and processing float are together known as collection or deposit float.

Company can use decentralized collection system, lockbox system to reduce the deposit floats.

- **Decentralized collections :** Company can have decentralized collection centres that collects the payment instruments such as cheques or drafts from the nearby customers and deposit the same in the local bank accounts.
- This helps to reduce mailing and processing time for realisation of payments. Funds from local bank accounts to centralized or concentration bank account using electronic fund transfer.

- **Lockbox system :** This is a very popular system in United States, where firm establishes collection centres near customers and place post box at the collection centres. Customers deposit payment instruments in post box which are directly collected and deposited to the company's bank account by local bankers of the company. This helps to substantially reduce the processing time as bank directly collects and deposit cheques.

With the advent of electronic fund transfers and online banking the use of cheques etc. for the payment is coming down drastically.

2. Control Disbursements

- Control of disbursements is essential for success of efficient cash management. This involves in slowing down payments to conserve cash and reduce borrowing requirements. The company should utilize the trade credit available for purchase and delay the payments to the due date.
- Company should make the payments early only where it earns the cash discounts. Unlike collection which involves decentralized collections for accelerate collections, the disbursement is centralized from one bank account.
- This helps the company to effectively control payments. The disbursement bank account is also the concentration bank account where all the balances are transferred from the local bank accounts. Sometimes the companies have issued cheques and the books of the company shows the payment, however due to mailing and processing time the cheque may not processed. In such cases company's bank balance will be higher than the book balance, because as per accounting books entry is passed when cheque issued. This difference is called as payment float or disbursement float.

6.4.2(C) Investment in Marketable Securities

Generally, firms try to maintain target level of cash or optimum level of cash. Excess cash over and above optimum level is invested in short-term marketable securities. In this section we will understand the firm's use of marketable securities. Investment in marketable securities held for cash needs for precautionary motive, controllable outflows such as dividend, tax payments etc. In choosing the marketable securities the firm should examine basic features of security such as

- **Safety :** The firm is investing cash in marketable securities for use at a later date on short notice. Hence the firm will invest funds only in very short term securities offering high degree of safety and very low default risk.
- **Marketability :** Marketability refers to the liquidity of the marketable security; it indicates the speed and convenience by which security or investment is converted into cash. The securities for investment should be highly marketable.



- **Maturity :** Maturity refers to the time period for repayment of principal and interest. As the maturity increases the risk increases and the liquidity reduces. The price of long term security varies with interest rates. To avoid volatility in price and ensure safety, the firms invest the cash surplus into short term securities.

Types of Short term instruments

- **Treasury Bills (T-bill) :** These are short term government securities and regarded as the safest and one of the most liquid security. Treasury bills issued by central government and have original maturity of 91 days, 182 days, 364 days.
- **Commercial papers (CP) :** These are short term unsecured debt instruments generally issued by large companies. These instrument have high liquidity. In line with Treasury bills these are also issued at a discount and redeemed at par.
- **Bank deposits :** These are fixed deposits held with the bank and varies between 7 days to 365 days or more.
- **Certificate of deposits (CD) :** These are unsecured debt instruments issued by the banks to raise short term funds. These are issued at discount and redeemed at par. They are highly liquid instruments.
- **Inter-corporate deposits (ICD) :** This is short deposit parked by one corporate entity with another. Generally, companies invest the ICDs with their sister concerns or subsidiaries. On the due date company receives principal and interest.
- **Money Market Mutual Funds :** This is one of the most popular instruments for parking short term funds. Money market mutual funds invest funds in the money market instruments such as treasury bills, commercial papers, certificate of deposits. Companies can invest funds in money market mutual funds and redeem the units as and when required.

6.4.3 Cash Balances to Maintain

- Most companies establish an optimum target of cash balances to maintain. Excess cash can be invested in marketable securities and interest can be earned. Idle cash means loss of opportunity to earn interest from investment. Higher the interest rate, larger will be opportunity cost of maintaining idle cash. At the same time the company needs sufficient cash to meet day to day requirements.
- The optimal balance should balance the twin objectives the ability to invest the excess cash for a return and ensure sufficient liquidity for future needs. How much cash is optimum cash? There are two methods for estimating optimum cash.

6.4.3(A) Determining Optimal Cash Balance under Conditions of Certainty - William Baumol's Cash Model

- The Baumol's model is based on the assumptions that all the cash needs are forecasted accurately and the payments are made uniformly over a period of time.
- The company incurs transaction cost whenever it converts marketable securities to cash and also incurs holding cost for keeping the idle cash balance.
- The objective of this model is to minimize the sum of the fixed costs of transactions and the opportunity cost of holding cash balances. The cost of holding cash increases as the idle cash increases. This is similar to Economic Order Quantity of EOQ concept of inventory management.
- Total cost is the sum total of holding cost and transaction cost of conversion of securities to cash. Holding cost is equivalent to the opportunity cost of maintaining average cash balance i.e. $\frac{C}{2}$, where C is the required cash balance.
- The company's holding cost is interest forgone on the average cash balance i.e. $k \left(\frac{C}{2} \right)$, where k is the interest rate for the period. Let's assume that the company incurs a transaction cost of c per transaction.
- Then cost for making total payment of T is $c \times \left(\frac{T}{C} \right)$

$$\text{Total Cost} = k \times \left(\frac{C}{2} \right) + c \times \left(\frac{T}{C} \right)$$

Using calculus, the C is minimum when

Formula : $C^* = \sqrt{\frac{2cT}{k}}$

Where

C - Optimal Cash balance

T - Total cash needed during the period

c - Cost per transaction

k - Opportunity cost holding cash for the period

Illustration

A firm estimated a cash requirement of Rs. 40000 over a month, where disbursement are made at constant rate. Opportunity interest rate is 8 percent per annum. The transaction cost is Rs. 100



$$\text{Optimum Cash Balance } C = \sqrt{\frac{2(100)(4000)}{\frac{8}{12}}} = \sqrt{\frac{8000000}{0.75}} = \text{Rs. 3265.}$$

$$\text{No. of transactions in a month} = \frac{40000}{3265} = 13.$$

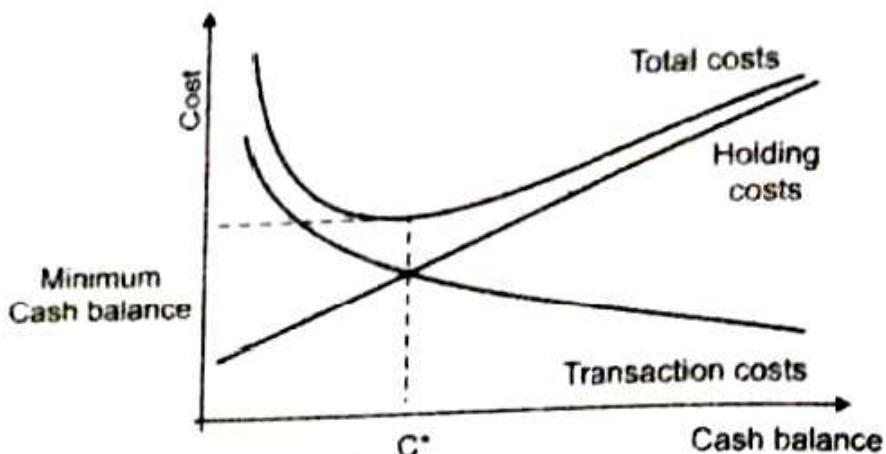


Fig. 6.4.2 : Optimal cash balance

6.4.3(B) Determining Optimal Cash Balance Under Conditions of Uncertainty - Miller-Orr's Cash Model

- Baumol's model is based on the assumption that payments can be accurately predicted. However, in practice cash inflows and outflows are uncertain. The model assumes cash inflows and cash outflows are stochastic i.e. each day a business may have both different cash payments and different cash receipts and the daily cash balance is normally distributed.
- The Miller-Orr model places an upper and lower limit for cash balances. When the upper limit is reached, a transfer of cash to marketable securities is made. When the lower limit is reached, a transfer from securities to cash occurs. A transaction will not occur as long as the cash balance falls within the limits. Securities are sold for the value such so that the cash balance rises to the Return Point.

$$\text{Return Point} = \text{Lower Limit} + \frac{1}{3} \times \text{Spread}$$

$$\text{Upper Limit} = \text{Lower Limit} + \text{Spread}$$

The equation for calculation spread is as follows :

$$\text{Spread} = 3 \times \sqrt[3]{\frac{(3)(\sigma^2)(c)}{4xk}}$$

Where

c - cost per transaction cost

k - opportunity cost of holding cash

σ^2 - variance of a daily cash balance.

- The Miller Orr can be explained by below chart of cash balance with time.

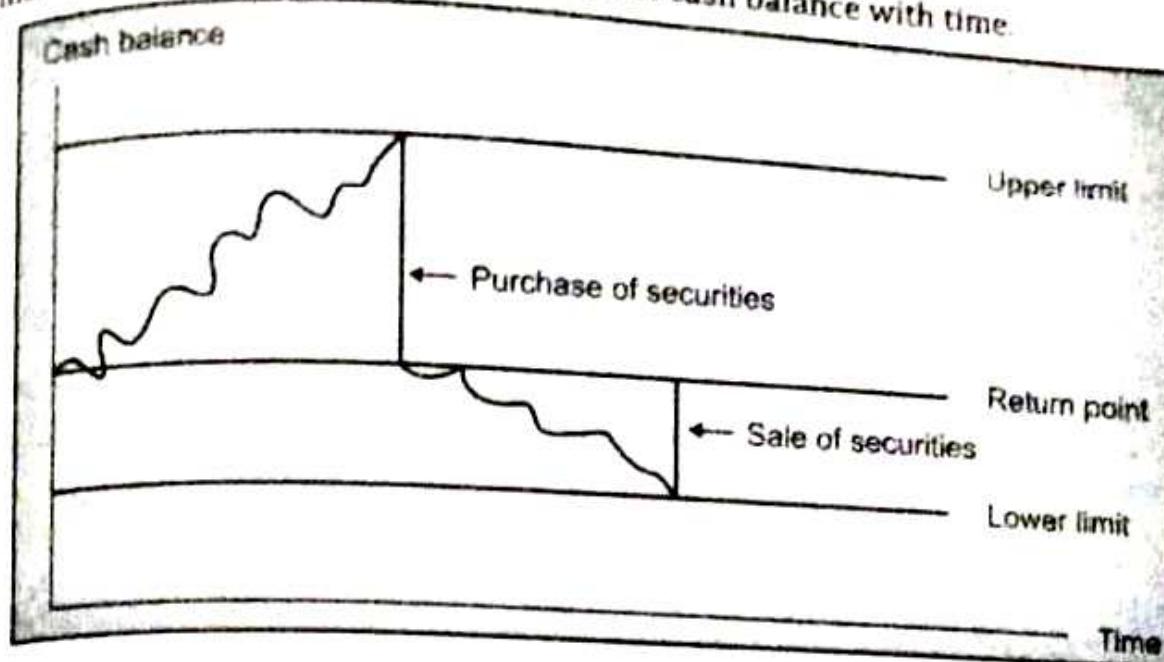


Fig. 6.4.3 : Chart

- When the actual cash balance drops to the lower limit, cash balance is increased upto the return point, which can be done by selling investments in marketable securities.
- When the actual cash balance touches the upper limit. In such cases, it is necessary to buy marketable securities and restore the cash balance down to the return point. The amount to be invested is the difference between the upper limit and return point.

Illustration

The management of a company has set a safety cash balance of Rs. 750,000. The standard deviation (σ) of the daily cash balance during the last year was 375,000, and the transaction cost was Rs. 1000. The company also has the opportunity to invest idle cash in marketable securities at an annual interest rate of 8%.

$$\text{Daily interest rate} = \frac{8\%}{365} = 0.022\%$$

$$\text{Spread} = 3 \times \frac{\sqrt[3]{(3)(375000)(375000)(1000)}}{(4)\left(\frac{8}{365}\right)}$$

$$\text{Spread} = 506481$$

$$\text{Return Point} = \text{Lower Limit} + \frac{1}{3} \times \text{Spread}$$

$$= 750,000 + \frac{506481}{3} = 918827$$

$$\text{Upper limit} = \text{Lower Limit} + \text{Spread}$$

$$= 750,000 + 506481 = 1,256,481$$

**Review Questions**

- Q. 1** Explain the concept of working capital, gross working capital and net working capital.
- Q. 2** Explain the concept of operating cycle and cash cycle.
- Q. 3** Explain the importance of working capital management.
- Q. 4** List the factors affecting working capital and explain in brief.
- Q. 5** Explain the trade-offs in optimum working capital management, inventory management, cash management, receivables management.
- Q. 6** What is economic order quantity and what is the trade-off for deciding economic order quantity or EOQ?
- Q. 7** What are the motives for holding cash balance?
- Q. 8** What are the three elements of credit policy in receivables management?
- Q. 9** What are the different types of short-term investments available for finance manager for investment of excess cash?

7

Module - 5

Syllabus

Sources of Finance and Capital Structure

Sources of Finance : Long Term Sources - Equity, Debt, and Hybrids; Mezzanine Finance; Sources of Short Term Finance - Trade Credit, Bank Finance, Commercial Paper, Project Finance.

Capital Structure : Factors Affecting an Entity's Capital Structure; Overview of Capital Structure Theories and Approaches - Net Income Approach, Net Operating Income Approach; Traditional Approach, and Modigliani-Miller Approach. Relation between Capital Structure and Corporate Value; Concept of Optimal Capital Structure.

A company needs to survive the down cycle and be agile enough to seize growth opportunities in an upcycle. Debt capital can be easier and faster to arrange than equity, however long-term impact on the flexibility and survival needs to be well understood. This chapter provides understanding about the concept of capital structure and different sources of financing.

Learning objectives

Long Term Sources of finance -Equity, Debt, and Hybrid, Mezzanine financing

Sources of Short-term finance - Trade Credit, Bank Finance, Commercial Paper

Project Finance

7.1 Introduction to Sources of Finance

In the previous chapter we discussed in detail the long term and short-term investment decision considerations for carrying out the investment function of finance manager. In this section, we will discuss the various sources of financing and financing considerations to carry out the financing function.

Sources of financing can be classified into two broad categories i.e.

1. Short term financing
2. Long term financing.



- Short term financing includes the sources of finance that are repayable within a period of 1 year. Long term financing includes the sources of finance that have maturity of more than 1 year and include sources that have no fixed maturity such as equity, perpetual debt etc.
- Fig. 7.1.1 shows the types of financing.

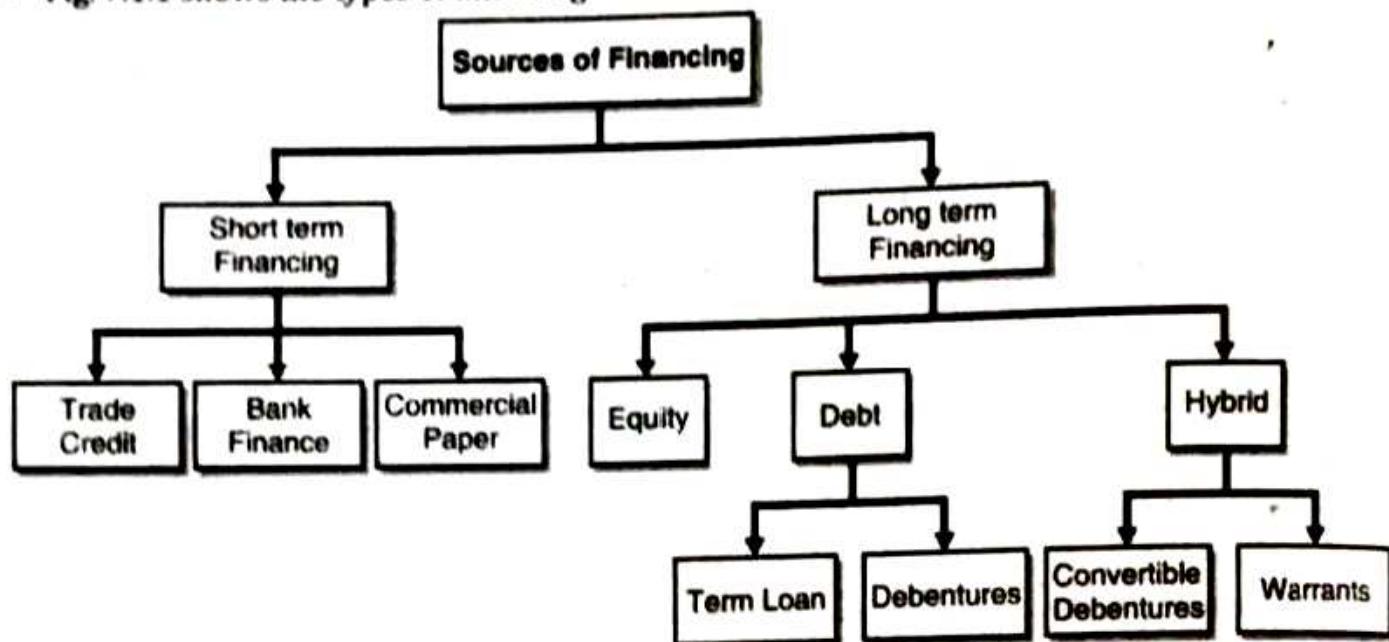


Fig. 7.1.1 : Types of financing

7.2 Long Term Sources of Financing

- Long term sources of financing are used by the companies to fund their long term or permanent fund requirements. These are the most critical source of financing for business as these provide the necessary capital for investment required for sustained growth of the company.
- Long term sources of finances are typically costlier than the short-term financing, however provides more flexibility to the company.
- These are used for funding long term outlays such as purchase of plant and machinery, land, building, investment in permanent working capital, expansion, acquisition of companies, assets, provide risk capital for new ventures etc.
- The most commonly used sources for long term financing are as below.

7.2.1 Equity

- Equity capital is also called as the ownership capital or shareholders capital. It consists of funds raised from existing and new shareholders of the company and earnings retained in the company.

- Equity shares are also known ordinary shares/common stock. Shareholders' capital is sum of paid up capital, share premium and retained earnings.
- Authorized capital represents the maximum capital that a company can raise from its shareholders and can be altered by the company as per the requirement after taking approval from shareholders. Authorized capital is divided into equity shares also called as ordinary shares. Each equity share has a face value or par value and generally in the denomination of from Rs. 1, Rs. 5, Rs. 10 or Rs. 100.
- When company raise funds and issue shares, equity capital that has been subscribed and paid by the shareholders of the company is called as issued and paid capital. It is equal to number of equity shares that have been issued and the face value of shares.
- Generally, company issues new shares to investors it issues at a premium to the face value to reflect the perceived market value of the company. Share premium represents the difference between the issue price and the face value of shares. For example, issue price of IRCTC share was Rs. 320 per share vs face value of Rs. 10.
- Another important component of share capital is retained earnings. It represents the total profits retained by the company in the business after paying out the dividend to shareholders of the company. Retained earnings are not a source of new capital; however, it forms part of ownership capital. As company has retained the earnings instead of distributing it to shareholders it is considered as a part of shareholders' capital.

7.2.1(A) Salient Features of Equity Shares

- **Ownership and voting rights :** Each equity share represents proportionate ownership of the company. Equity shareholders have voting rights in proportion to their shareholding. Shareholders are expected to vote on multiple matters such as appointment of directors on the board of the company, new fund raising, acquisition or merger etc. In modern times, shareholders can also vote using e-voting option. A company needs to conduct annual general meeting of shareholders once a year, where directors elected based on majority votes. Investors can vote in person or appoint another person to vote called as proxy voting. To safeguard rights of minority shareholders, there are registered investment management companies that cast proxy votes on behalf of mutual fund shareholders or high net worth investors.



- **Control over management :** Shareholders can exercise control over the management through board of directors, voting on managerial compensation etc.
- **Claim on assets :** Equity shareholders have a residual claim on the assets of the company in the case of liquidation.
- At the time of liquidation of company, claims of debt holders, financiers, government, employees, trade creditors are first paid off. The shareholders are paid off only the residual amount.
- **Limited liability :** As a company is separate legal person, shareholders of the company are not required to share any liabilities of the company. So in case of failure of the company or financial distress etc. shareholders are not required to contribute any shortfall etc. Equity shareholder is holding the risk only to the amount that they have invested in the shares of the company.
- **Dividend :** Whenever a company declares a dividend, all shareholders have the right to receive dividends in proportion to their shareholding.
- **Freely transferable :** Generally, there are no restriction on sale of equity share of publicly listed companies, hence shareholders can easily sell equity shares and convert to cash.

Advantages of Equity Funding

1. It is a source of permanent capital for the company. It provides company flexibility to take up riskier and long gestation projects.
2. Equity shares do not carry any fixed payment such as interest or coupon. Payment of dividend is entirely at the discretion of the company.
3. Equity share capital provides leverage to raise additional debt at more attractive terms; as well capitalized companies are considered less risky by the financiers.
4. Equity funding allows the company to increase shareholder base and brand name of the company.

Disadvantages of Equity Funding

1. Fund raising through equity can lead to dilution of the ownership and control of the promoters.
2. Fund raising through equity is costlier due to compliance cost associated with fund raising from public.
3. Dividend paid out to the shareholders are not tax deductible, hence vis-a-vis debt it a less tax efficient source of financing.
4. Cost of equity is generally higher than debt, as investor expects higher returns for the risk.

7.2.1(B) Means of Raising Equity

1. Public Issues

Under this method, the company is raising equity capital by issuing shares to general public. Company prepares a prospectus containing details such as the purpose for which funds are being raised, past financial performance of the company, background and future prospects of company. This information helps the general public to decide whether to invest or not in this company. Securities issued by this method are generally listed on stock exchanges and available for sale and purchase on exchanges. There are two types of funding through public issuance.

- Initial Public Offering (IPO) :** This is an offering by an unlisted company for the first time in its life to the general public. It contains either a fresh issue of shares.
- Follow-on Public Offering (FPO) :** This is an offer of sale of shares by an already listed company through an offer document to the general public.

2. Rights Issue

This is a method of raising of funds through issuance of new shares by the company to existing shareholders. The shareholders are offered the 'right' to buy new shares in proportion to the number of shares they already possess. The existing shareholders may accept or reject the right. Shareholders who do not wish to take up the right shares can sell their rights to another person. If the shareholders neither subscribe the shares nor transfer their rights, then the company can offer the shares to public.

3. Private Placement

In this method, company allots shares to institutional investors and some selected individuals. It helps to raise capital more quickly than a public issue. This involves issuance of securities to less than 50 persons without issuing prospectus letter of offer and without seeking permission for listing for the shares. The issuers could be public limit companies or private limited companies. These securities may be listed or unlisted.

4. Offer for Sale

Under this method, shares are offered for sale through intermediaries like issuing houses or stock brokers at pre agreed price. These intermediaries resell the securities to the ultimate investors at a market related price. This price is generally higher and the difference between the purchase price and the issue price represents profit for the intermediaries. This method is not common in India.



7.2.2 Debt

Debt capital represents most common source of long-term finance and consists of debentures and term loans.

7.2.2(A) Debentures

Debentures or bonds are an attractive source of long-term financing for high rated credit worthy companies. These are generally issued by the companies to banks or institutional investors such as mutual funds, insurance companies etc. Debentures are classified into two broad types Non-convertible Debentures (NCD) and Convertible Debentures. Non-convertible debentures form part of debt financing while convertible debenture are considered hybrid source of finance.

Non-convertible debentures (NCDs)

- NCDs are long term debt instruments and are repayable on maturity.
- Interest on the debentures is paid by the issuing company on monthly, quarterly, semi-annually or annually at fixed or a variable rate as agreed at the time of issuance of the company.
- NCDs are either secured by the assets of the company or unsecured.
- In some cases, instead of interest payment, the NCDs are issued at a discount to the face value of the debenture and are redeemed at par or face value. The difference between issue price and face value represents the income for the investors.
- NCDs are freely transferable and traded on stock exchange or over the counter market.

Advantages of NCDs

- Cost effective source of financing as NCDs typically lower interest rates due to liquidity.
- NCDs can be structured to suit cash flows of the company such as zero coupon bonds, monthly or annual interest payment, full repayment on maturity and intermediate period etc.
- Ownership is not diluted in NCD issuance.
- Interest paid on NCDs is not tax deductible.

Disadvantages

- NCD is attractive source of finance only for highly rated companies.
- NCD has fixed interest and repayment obligations. Delay in servicing of NCD interest can impact reputation of company as information on listed NCDs is freely available.
- Many NCDs have terms and conditions that may impact company's flexibility in undertaking critical decisions.

7.2.2(B) Term Loans

- Term loans are one of the most popular sources of long-term financing for medium and small companies and are used for purposes such as for business expansion, purchase equipment, land, building, managing cash flow etc.
- Term loans have fixed maturity and repayable over the maturity period in regular payments.
- Term loans have maturity of more than 1 year and depends on the purpose of financing.
- For example, term loans for capital projects are for a period of more than 5 years, while working capital term are generally for a period of 3 years.
- Term loans can be secured or unsecured in nature. Secured term loans are the ones where the loan is secured by fixed asset security such as land, building, plant and machinery etc. and these are most common.
- In India, term loans are provided by banks and Non-Banking Finance Companies (NBFCs).
- Unsecured term loans are provided for a smaller amounts and shorter tenor.
- The company taking a loan is called as borrower and bank or NBFC providing the loan is called as lender. In some cases, lenders provide time of 6 months to 2 years, before recovering regular repayments called moratorium period, to provide time for construction and commencement of production.

Advantages

- Term loans are directly negotiated between borrower and lender and are processed faster compared to other long term source of financing.
- Borrower need not require credit rating etc. for availing term loan.
- Information regarding delay on term loan servicing is confidential between lender and borrower.
- Ownership is not diluted.
- Interest paid on term loans is tax deductible.

Disadvantage

- Term loans generally carry higher cost of borrowing compared to NCDs.
- Term loans require regular repayment, hence less flexible.
- Lending terms may include restrictive covenants that company may find difficult to comply.

7.2.3 Hybrid Financing

Hybrid financing refers to the financing instrument that has some properties of debt as well as equity. These are tailor made to balance flexibility for the company and risk protection for the investors.

The important forms of hybrid Financing are :

1. Preference shares.
2. Convertible debentures.
3. Warrants etc.

7.2.3(A) Preference Shares

Preference shares carry fixed maturity and fixed rate of dividend, payable from the profits made by the company. These carry preferential rights on dividends and assets of the company hence called as preference shares. In the year company does not make profits, it can skip the dividend to preference shareholders, however the amount is added to dividend payable for the next year. The preference shares form part of the net worth of the company.

Advantages

- Preference shares form part of the net worth of the company, hence help improve the leverage position.
- Company can skip dividend to preference shareholders in the event of loss, hence is more flexible compared to other sources of debt.
- There is no dilution of ownership or voting rights.

Disadvantages

- Preference shares generally carry higher rate than traditional debt instruments such as NCDs, term loans etc.
- Dividend paid on preference shares is not tax-deductible.
- In some cases, preference shareholders may have right to convert to equity shares if company skips dividend payment for some period.

7.2.3(B) Convertible Debentures

- Convertible Debentures are a type of debentures that can be converted into the equity shares of the company after a stipulated time period at the option of the debenture holder. In special cases, issuer can also have option to convert debentures into equity shares.
- During the tenor of the debentures, issuer company pays interest or coupon at the pre-agreed rate of interest.
- The terms of issuance such as conversion price into equity share, tenor, interest payment frequency etc. are fixed at the time of issuance. Convertible debentures are mainly of 3 types.

(a) Compulsorily convertible debentures (CCD) : These debentures are compulsorily converted into equity shares at the end of tenor (maturity) of the debenture. For listed companies such a maximum conversion tenor is fixed at 18 months. For private limited the tenor of convertible debentures can be higher.

- (a) **Optionally convertible debentures (OCD)** : These debentures can be converted into equity shares at the end of tenor (maturity) of the debenture at the option of debenture holders. For a listed company, the maximum tenor for OCDs is 36 months.
- (b) **Partly convertible debentures** : In case of partly convertible debentures, some portion of debentures can be converted into equity shares. These are not very popular.

Advantages

- Convertible debentures help attract funding during uncertain times. It is a popular source of funding for start-ups.
- Compulsorily convertible debentures help in reducing financial leverage of the company.

Disadvantages

- In case of optionally convertible debentures, conversion to equity depends at the option of debenture holder and company may have to plan for redemption.
- Conversion to equity can result in dilution of ownership.
- Unlike equity, company has to pay coupon on the debentures during the tenor.

7.2.3(C) Warrants

- A warrant is a derivative instrument which provides the holder of warrants right to buy the shares of the issuing company at a fixed price called exercise price until the expiry date.
- Warrants can be traded in the secondary market by the investors.
- There two main types of warrants known as call and put warrants. Callable warrants entitle investors with the right to buy shares of a company from that company at a pre agreed price at a future date prior to expiration. When a warrant holder decides to exercise the right, company issues the shares to the warrant holder.
- A Puttable warrants offer investors the right to sell shares of a company back to that company at a specific price at a future date prior to expiration.
- Warrants are sometimes issued with the preference shares or bonds to make the issue attractive for investors and reduce the rate of dividend or interest rate as applicable. These warrants are detachable meaning they can be separated from preference shares or bonds can sold separately.

Advantages

- A warrant does not offer any voting rights to investor..
- It is an instrument to attract investors during uncertain times.



Disadvantages

- Warrants are dilutive post conversion.
- Due to uncertainty on conversion it may not result in new equity infusion.

7.2.4 Mezzanine Finance

- 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.

Features of mezzanine financing

- 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.

Advantages

- 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.

Disadvantages

- Lender may put restrictive covenants on the company.
- Interest rates on mezzanine debt are typically very high.

7.3 Sources of Short-term Financing

- Short term sources of finance are repayable within a period of 1 year and are used for meeting day to day or working capital requirements such as purchase of inputs for production, extending credit to customers, payment of salaries, overheads etc.

- The most commonly used sources of short term financing are :
 1. Trade credit
 2. Bank finance
 3. Commercial paper.
- Short term sources of financing are generally cheaper and easily available, hence there is a tendency to use short term sources wherever possible. However, this strategy of financing is fraught with risk. Use of short term sources for funding long term resources can lead to shortage of funds at the time of repayment.
- This leads to mismatch in payment obligations of facilities and cash inflows from long term investments. If the same is not refinanced in time can lead to financial distress, default and bankruptcy in some cases.
- Use of short term sources to provide long term loans have been identified as one of the reasons for some recent failures of the companies. Board of directions and management should avoid such temptation.

7.3.1 Trade Credit

- Trade credit is an important source of short-term funding and arises due to the credit period availed by the company from their suppliers for payment.
- Credit period depends upon the industry norms, credit policy of the suppliers and credit worthiness of the company. Sometimes suppliers offer cash discount for early payment of trade credit to expedite the collection.
- Depending on the amount of cash discount and availability of funding, a company can decide whether to avail trade credit or pay in cash. Credit terms include cash discount rate, discount period and credit period. For example, "2/5, net 45' means credit period of 45 days and cash discount of 2 percent for payment within 5 days. Some companies purchase goods on credit and sell on cash to end customers, thus operating without any investment in working capital.

Advantages

- Companies need not enter into any formal agreement or provide any security for availing trade credit.
- It can be availed quickly, hence fastest way to grow sales.
- It helps company to reduce financial leverage or external debt.

Disadvantages

- Suppliers may increase price to account for credit period interest.



- New companies find it difficult to get credit.
- Credit period offered in trade credit is generally short.

7.3.2 Bank Finance

- Bank finance is the second most common source of short-term finance. Many large creditworthy companies prefer bank finance over utilizing credit due to cheaper rates.
- In this mode of financing, banks assess the credit requirement of customers after analyzing sales, current assets and trade credit position and provide a credit limit to the customer against the security of accounts receivables or inventory as collateral security.
- Credit limit is generally set for a period of 1 year and renewed each year. Following are the most used short facilities provided by the banks.

7.3.2(A) Cash Credit

Cash credit or CC is a working capital facility offered by the banks. In this, banks sanction a credit limit to the business depending on the credit worthiness and position of current assets. Following are the features of cash credit facility.

Features of cash credit facility

- Cash credit or CC limit is the credit limit granted by banks to business for meeting their working capital needs.
- Cash credit limit is sanctioned for a year of up to 1 year and must be renewed every year by the borrower.
- Generally, banks require collateral in the form of land, building, fixed deposits etc. for granting CC facility.
- Borrower can withdraw funds upto the credit limit and repay as per their requirement. There are no restrictions on the number of withdrawals or repayments, as this is a revolving limit.
- Interest is charged on the daily outstanding balance and not on total limit.

Advantages

- CC limit offers high degree of flexibility as business can borrow and repay any time during the year.
- Interest is payable on the outstanding amount and not on the credit limit.
- No principal repayment required and only interest is charged at the end of every on the average outstanding balance.

Disadvantages

- Cash credit limit need to be renewed every year.
- Banks generally restrict the limits only upto the extent of net current assets with a margin of 25%. In case of shortfall in the amount of underlying current assets, banks may require companies to repay the shortfall amount and reduce the limit.
- Banks may charge a minimum fees or commitment charges to ensure utilization of CC limit.

7.3.2(B) Overdraft

Under this facility banks allow the customer to draw funds over and above the balance in the current account upto a certain fixed limit, called an overdraft limit. This limit operates similar to CC facility and need to be renewed every year. The limits granted under this facility are smaller in size and carry higher rate of interest.

7.3.2(C) Bill Discounting

- Under this facility a company can discount the invoice or bills for the goods or services billed to its customers. Company approaches bank with the bills accepted by its customers and banks makes the payment to the company after deducting applicable discount charges.
- On the due date, bank collects the payments from the customer of the company. Before discounting the bills or invoices bank checks the creditworthiness of the customer to which the amount is billed. The bank requires the bills to be duly accepted by the customer.
- With large scale of implementation of enterprise resource planning or supply chain management solutions, the bill discounting has moved to electronic platform and acceptance of this product has increased.

7.3.3 Commercial Paper (CPs)

- Commercial paper is a short-term unsecured money market instrument with a maturity ranging from 7 days to 364 days.
- Companies having a good credit rating can raise working capital funds by issuing commercial papers.
- A company issuing commercial paper need to obtain credit rating of the proposed issuance from the credit rating agencies. Commercial papers are subscribed by banks, mutual funds, insurance companies etc.

Features of commercial paper

- Commercial papers are issued at a discount and redeemed at face value. The difference between the issue price and face value represent the interest income for investor.



- Commercial papers are issued in denominations of Rs. 5 lakh or multiples thereof.
- Commercial papers are freely transferable.

Advantages

- Commercial paper is cost effective source of working capital finance for large companies.
- It is unsecured in nature.
- It can be issued for different maturities upto 1 year depending on the requirement.
- Commercial papers do not require any interest outflow till the maturity.

Disadvantages

- Issuance of commercial paper involves rating charges, stamping charges, issuing and paying agent charges and is not viable source of financing for smaller companies.
- Any delay in repayment of commercial paper can be reported widely and can dent reputation of the company.

7.4 Project Finance

- Project finance refers to long term financing for infrastructure, industrial projects where funding is mainly provided on the strength of the project cash flows and is secured by all assets of the project, including any long-term revenue agreements. Lenders have no recourse or limited recourse to the sponsors (investors) of the project, which means that in case default lenders cannot ask the sponsors to make payment. Typical examples of project finance are airports, roads, mines, oil blocks, power plants etc.
- In the project finance, a separate legal entity called as Special Purpose Vehicle (SPV) is created by investors (or sponsors). The SPV owns the project and funding is raised by the SPV. To mitigate the risk associated with the projects and ensure viability, the SPV generally enter into long term sale agreements with customers or take or pay agreements. Long term purchase agreements are common in setting up new power plants, where the SPV enters into long term contract with electricity distributions to purchase electricity at pre agreed price. In industrial projects, it is common practice to enter into take or pay arrangements with the customers.
- This involves customer agreeing to buy off take from the project or pay some fixed penalty for any shortfall in off take or purchase from the project. As the financing amount involved are very large and repayment tenor is long, project finance is provided by a syndicate or consortium of banks or financial institutions.
- As the repayment of project finance depends on the success of projects, there are multiple parties are involved in the project financing.

- Some of the important parties involved in the success of project are
- 1. **Sponsors** : There are the providers of the initial capital for the project in the form of equity and/or subordinated loans. The sponsor will normally have experience in the relevant sector and will support the project company by providing skilled personnel.
- 2. **Special Purpose Vehicle (SPV)** : This is also known as project vehicle and is set up by the sponsor specifically for the purpose of the project and owns the project.
- 3. **Contractors** : These are the entities that the SPV appoints to build and maintain the project. Sometimes SPV also appoints contractors for operating the projects.
- 4. **Off-takers** : Off-takers are the parties that purchase output from the project. In most of the projects, the SPVs enter into long term arrangements with the off takers to sale the output to ensure viability and reduce the risk. Many a times such long term contracts are executed with the government agencies.
- 5. **Banks/Financial Institutions** : These are the lenders to the project and generally form a consortium of bankers. The cash flows and assets of the project are secured to them.
- 6. **Specialist Advisors** : These are the specialists having domain knowledge of the industry and provide inputs regarding the planning, viability and execution of the project.

Risks involved in project financing and management of risks

Project financing involves multiple risks such as completion risk, cost overruns, market risk, environmental risk, foreign exchange risk, political risk etc. Sponsors and lenders need to assess these risks and built suitable mitigants to manage the risks.

- **Completion risk** : Completion risk can be mitigated by awarding turnkey contracts, taking performance bonds from contractors.
- **Cost Overrun** : In case of cost overruns a standby credit, facility can be used, or lenders may require the sponsors to guarantee to fund cost overruns.
- **Market risks** : Market risk refers to the risks associated with the shortfall in demand or off take when production commences. To mitigate these, SPVs are required to enter long term contracts with the off takers or take or pay agreements. Long term purchase agreements ensure visibility of revenues. In case take or pay arrangement off takers need to pay penalty in case they don't lift, or off take contacted quantity.
- **Environmental/Government risks** : Many times, the projects are environmentally sensitive and need approval from the relevant environmental agencies and regulators. Hence, the finance documents include necessary representation and warranties regarding the necessary approvals for the project and in case of misrepresentation the same is treated as default. Sometimes change in government policy can affect the viability of the project. In such cases, sponsors may seek Government guarantees.



- **Foreign exchange risks :** Foreign exchange risk arises where projects are funded in foreign currency and revenues of projects are in domestic currency. Sharp depreciation of domestic currency can affect repayment of the project and in such cases foreign exchange risk can be covered through convertibility guarantee from the government. Following diagram explains the working of project finance transaction.

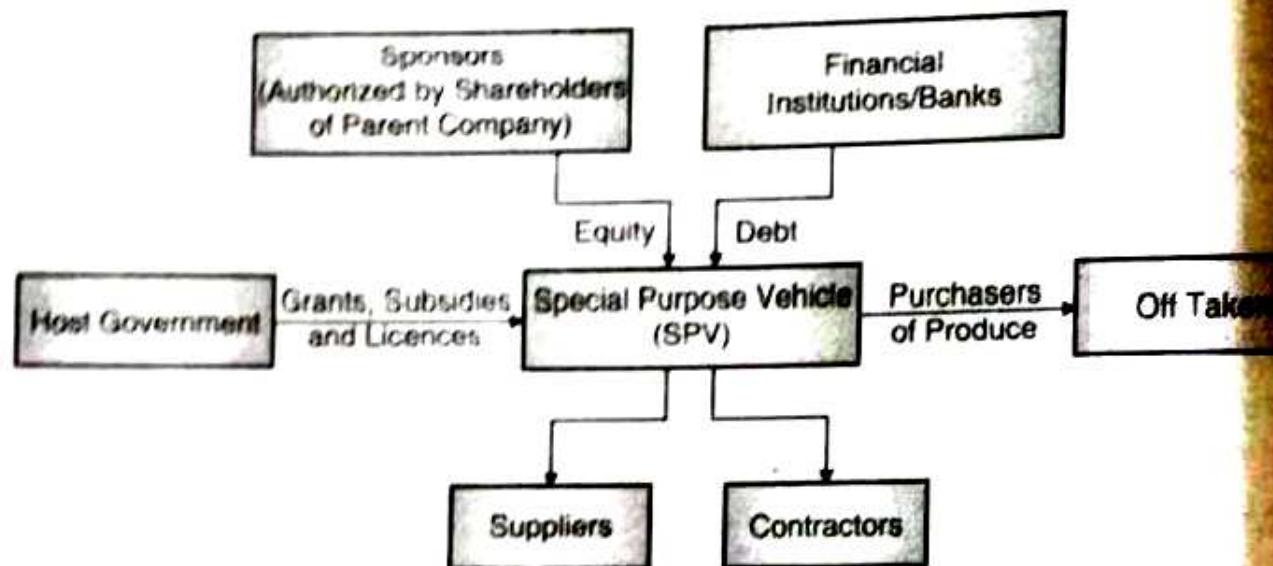


Fig. 7.4.1 : Working of project finance

Advantages of Project Finance

- Lenders have limited or no recourse on the sponsor.
- Ability to undertake projects with long gestation periods.
- Project finance is an off-balance sheet financing for sponsors; so does not affect sponsor's financial leverage.
- Allows better tax treatment for the project.
- More than one sponsors can be inducted to mitigate the risk of the project.

Disadvantages of Project Finance

- Due to complex nature of projects project finance involves higher cost of due diligence, legal documentation.
- It is very time consuming process to tie up funding under the project finance.
- Generally, the rate of interest is higher compared to financing with no recourse.
- Lenders will generally incorporate number of restrictive covenants that may limit operational flexibility of the project vehicles.

7.5 Capital Structure

Capital structure denotes the way of company finances itself. Capital structure of the company is the combination of debt and equity in the total capital of the company. Composition debt between long term and short term debt is also considered in the capital structure. The use of debt and preference shares is described as financial leverage or trading on equity, as they are raised on the basis of equity position.

- The ratio debt to total capital is called as leverage. Debt capital and preference shares need to be serviced with periodic interest and dividend payments. The use of financial leverage is double edged sword. If a firm can earn higher returns than cost of debt, shareholders' earnings will increase and if the rate of return is lower than the cost of debt, it will erode shareholders' earnings.
- Popular measures to calculate capital structure are Debt ratio and debt to equity ratio and are calculated as below:

$$\text{Debt ratio} = \frac{\text{Debt}}{\text{Total capital}} = \frac{D}{D+E}$$

$$\text{Debt to equity ratio} = \frac{\text{Debt}}{\text{Equity}} = \frac{D}{E}$$

- Capital structure has an impact on the shareholders' earnings and risk and the value of the company. Hence it is important to have optimum capital structure.

7.5.1 Factors Affecting Capital Structure of the Company

Whenever a finance manager needs to decide on the financing for the investment, they evaluate multiple financing options and are expected to choose one that enhances the shareholders' value. There many factors that affect the capital structure of the company. These are internal to the company as well as external to the company. Important factors affecting the capital structure are listed below :

- Cyclical/Stability of business :** Cyclical business are expected to have large and frequent fluctuations in sales, such firms may find it difficult to have stable earnings to meet fixed expenses. On the hand, stable businesses with large base of fixed assets can have steady stream of revenues and profits. Such firms can choose to have more leverage. Examples of such businesses are utilities as electricity companies, telecom operators etc.
- Cost :** Cost of financing is an important consideration for deciding on financial leverage. The costs of raising funds through different sources of finance are considered and cheaper source of finance is chosen.



- **Floatation Costs** : Floatation costs refer to the costs associated with raising of funds such as processing fees, broker's commission, underwriting fees, expenses on the prospectus, etc. Higher the floatation cost of a source, the less attractive.
- **Control Considerations** : If the issuance of more shares may lead to substantial dilution of promoter shareholding or loss of control, company may not consider the equity issuance for fund raising and will prefer debt funding.
- **Tax Rate** : Interest is tax deductible expense, higher the tax rate large is the value of savings on interest expense and lower is the after tax cost of debt. Hence a higher tax rate make debt relatively cheaper and more attractive.
- **Capital market condition** : When the capital markets are booming, firms can find it easier to raise funds through equity and command higher valuation. Hence, in booming markets firms make a beeline to raise funds through IPO or private placement.
- **Competition** : Firms operating in industries with intense competition are likely to face pressure on earnings, hence are expected to limit the financial leverage to avoid the risk.

7.5.2 Capital Structure Theories

Capital structure theories aim to establish relationship between capital structure and market value of the firm. Important capital structure theories have been discussed as below:

7.5.2(A) Net Income Approach

- Net income approach proposed by Durand in 1952, suggests that value of the firm increases by increasing the financial leverage.

Assumptions

- 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 is sum of the weighted average cost of equity and debt.

$$\text{WACC} = \text{Cost of Equity} \times \text{Equity weight} + \text{Cost of Debt} \times \text{Debt weight}$$

In this approach,

$$\begin{aligned}\text{Value of the firm} &= \text{Value of equity} + \text{Value of debt} \\ &= \frac{\text{Net income}}{\text{Cost of equity}} + \frac{\text{Interest}}{\text{Cost of debt}}\end{aligned}$$

$$= \frac{NI}{k_e} + \frac{1}{k_d}$$

$$\text{Value of the firm} = \frac{\text{Net operating income}}{\text{Weighted average cost of capital}}$$

$$= \frac{\text{NOI}}{\text{WACC}}$$

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.



7.5.2(B) Net Operating Income (NOI)

Net operating income theory states that the value of the firm depends on net operating income and risk of the business and is independent of the capital structure of the firm. This theory is developed by Durand.

Assumptions

- Value of the firm is dependent on the operating income and the associated business risk of the firm and both these factors not affected by the financial leverage.
- The weighted average cost of capital and the value of firm are independent of the financial leverage.
- It assumes that the equity investors will demand higher returns to compensate risk due to increase in proportion of leverage.

As per this approach,

$$\text{Total Market Value of the firm (V)} = \frac{\text{EBIT}}{k_w}$$

$$V = D + E$$

$$E = V - D$$

As cost of debt is constant

$$E = \frac{\text{NOI} - I}{k_d}$$

k_w - Overall cost of firm

D - Market value of debt

E - Market value of equity

NOI - Net operating income

Illustration

Debt ratio	20%	50%	80%
Debt Amount	80,000	2,00,000	3,20,000
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
WACC (k_w)	11.5%	11.5%	11.5%
Value of the firm (V)	4,34,783	4,34,783	4,34,783
Market Value of Debt (D)	80,000	2,00,000	3,20,000
Market value of equity E = (V - D)	3,54,783	2,34,783	1,14,783
Cost of equity (NI/E)	12.3%	14.5%	21.3%

In the above example, under the NOI approach value of the firm remains constant with change in leverage as the higher proportion of low cost debt is offset by increase in cost of equity.

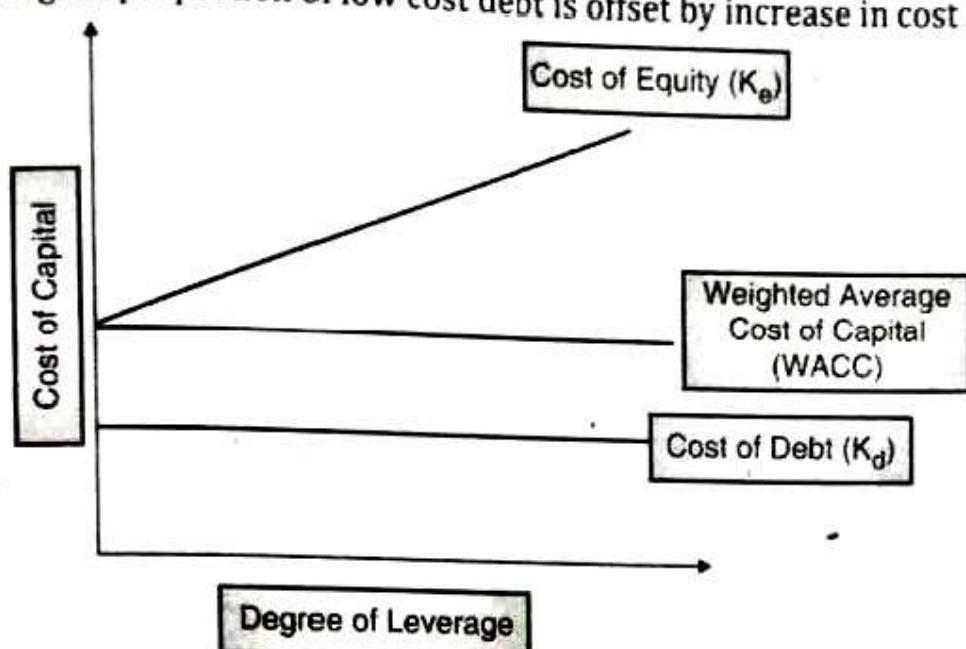


Fig. 7.5.1 : Diagrammatic representation of NOI approach

7.5.2(C) Traditional Approach

Traditional approach is intermediate between the net income and net operating income approach. As per this approach, it is possible to reduce cost of capital by using optimum mix of debt and equity. Cost of capital for the firm will reduce and market value will increase as the share of debt in the total capital reaches optimum level, after which cost of capital will increase and market will decline as equity shareholders more returns for the increased risk. Traditional approach is based on following assumptions :

- (a) The cost of debt capital remains constant up to a certain level and thereafter rises.
- (b) The cost of equity Capital remains constant more or less up to a certain level and thereafter increases rapidly.

Traditional approach can be illustrated in Fig. 7.5.2.

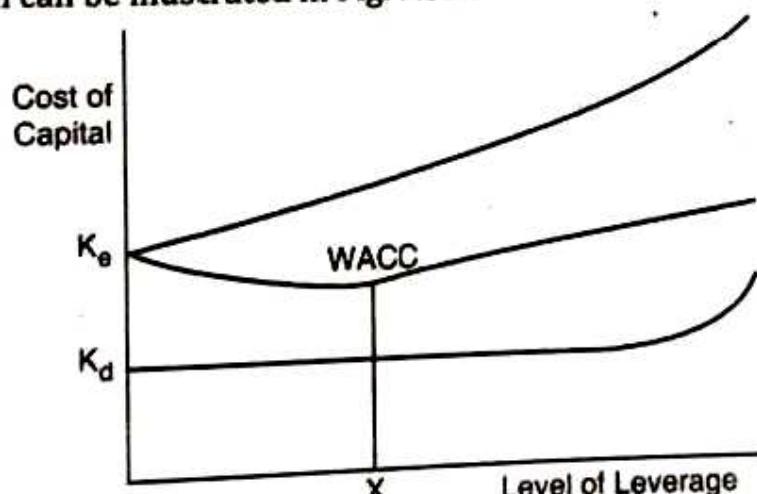


Fig. 7.5.2 : Traditional approach



7.5.2(D) Modigliani - Miller Approach to Capital Structure

Modigliani and Miller approach advocates that the change in capital structure does not have impact on overall cost of capital and value of the firm. This approach is similar to net operating income approach and recognizes only the net operating income and risk of investment as factors impacting cost of capital and value of the firm.

Modigliani - Miller approach is based on following assumptions :

- There are no taxes i.e. income tax or tax on dividend.
- There are no transaction costs for buying and selling securities.
- There is no bankruptcy cost.
- There is a symmetry of information between the investors and company.
- Investors will behave rationally.

Modigliani - Miller approach in real world

In practice however corporations have to pay taxes on income and dividend may also be taxed. Further, there are transaction costs involved and information asymmetry also prevails. Hence, the extent of these factors, financial leverage reduces WACC and increases the value of the firm.

7.5.3 Elements of Capital Structure

While planning capital structure of a company, the finance manager needs to consider various elements of the capital structure. Some of the important elements are as follows :

- **Capital mix :** This represents mix between sources of finance i.e. debt and equity. Company should decide a target capital mix suitable for its business and try to achieve the same while deciding in financing new investment. With additional debt cost of financial distress will be higher and company will need to incur floatation cost. For issuance of new shares Company will need to incur floatation costs and may also lead to dilution of control of existing shareholders. Hence, in terms of preference, companies will first use retained earnings followed by debt and fresh equity.
- **Maturity and priority :** This refers to the maturity of debt obligations and priority of repayment of debt holders. Longer maturity debt provides flexibility to the company. Shorter maturity debt is cheaper but restricts the flexibility. Companies prefer to match the maturities of the debt with the cash flows, by financing short term assets using short term debt and long term assets using long term debt. However, there is not always 100% matching and sometimes companies use short term debt to finance long term assets for a temporary period and gradually refinance using long term debt.
- **Terms and conditions :** This refers to the terms and conditions prescribed by lenders or equity providers when a company avails financing.

- These may include restrictions on capital expenditure, meeting certain financial targets, restriction on dividends etc. and form part of the agreements. Companies need to carefully negotiate and ensure that the operational flexibility and strategic objectives of the company and interests of shareholders are not compromised.
- Currency :** Companies need not depend on single currency for its financing needs. Large companies can raise funds in foreign currencies such as Dollar, Japanese Yen, Euro etc. to take advantage of favourable interest rates and depth of the markets. However, currency risk needs to be kept in mind and need to be managed by hedging the repayment obligations. Companies having large foreign currency income need not actively hedge repayment, others need to hedge the exposure in currency market using appropriate financial instruments.
- Financial market segments :** This refers to the various market segments which a company can tap for raising finance to suit its requirements. For example, company use domestic or foreign market for a long-term financing. Company can raise financing using bilateral arrangements or consortium of banks. It can choose finance from banks or raise funds by issuing debentures in the capital market. Companies having large funding requirements prefer to diversify the sources of funding to avoid dependence on single financier or market.

7.5.4 Optimum Capital Structure

The optimum capital structure is that capital structure that leads to the maximization of the value of the firm and minimizing cost of capital. The use of debt capital in capital structure increases the earnings per share as the interest on debt is tax deductible. However, higher levels of debt in capital structure leads to increase in cost of financial distress and cost of equity, thus adversely affecting the market value of shares. Optimum capital structure balance trade-off between higher earnings per share and cost of financial distress to maximize the market value of the firm.

Following theories provide different approaches for deciding an optimum capital structure :

- (a) **EBIT-EPS analysis :** EBIT-EPS analysis is an important tool for designing the optimal capital structure framework of the firm. EPS i.e. earnings per share denotes the earnings available to shareholders. As per this approach, optimum capital aims to maximize the EPS for a range of EBIT i.e. earnings before interest and taxes. EBIT of the companies fluctuate with change in sales and profit margins. If the interest costs are high for companies having large fluctuations in EBIT, the EPS can turn negative when EBIT fall substantially. Hence, companies having large fluctuations in EBIT should use less leverage. Companies having stable EBIT can use relatively higher leverage or debt. Financial break-even point and financial indifference points help in deciding the leverage.



(b) Financial Break-even : It denotes the level of EBIT for which the firm's EPS is about zero. If the estimated level of EBIT is substantially higher than the break-even point, company can use debt to the capital.

(c) Financial Indifference Point : This refers to a point where two different capital structures produce same EPS for different levels of EBIT. When the EBIT exceeds over the point of financial indifference, company can fund using more debt.

(d) Cash flow analysis : In the cash flow analysis, company will study cash flows available for servicing of debt and accordingly plan the funding. Cash flows represent the operating cash flows i.e. post-tax EBIT after making adjustment for balance sheet items. Debt service include interest on the debt and contracted repayment of debt as per the repayment schedule. Cash flow analysis is a very important tool to measure the repayment capacity.

Net profit may not always translate into cash during that period or decline in profit may not necessarily impact cash generation. For example, company may be planning higher sales and profits in coming periods, however it may have to block funds in higher credit and inventories. In such cases, higher profit may not translate into higher cash generation and company may not be able to service larger debt payments.

Cash flows and debt obligations are plotted for each of the forecast period and debt service coverage and debt capacity of the company is calculated. Debt service coverage i.e. ratio of cash flows to the debt obligations. Debt service coverage ratio indicates the capability of company to service debt. Debt capacity represents total debt that a company can service over the period. Difference between debt capacity and debt position represents room available for company to raise debt in the case of requirement.

Review Questions

Sources of finances

- Q. 1 Compare the features of equity shares, debentures and preference shares.
- Q. 2 What are the characteristics and advantages of equity financing?
- Q. 3 Discuss various means of raising equity financing.
- Q. 4 Explain the features of debentures. What are the types of debentures?
- Q. 5 Explain the pros and cons of debentures.
- Q. 6 Explain the advantages and disadvantages of preference shares?
- Q. 7 What is the difference between term loan and debentures?
- Q. 8 What is warrant?
- Q. 9 Enlist different sources of short term financing for a firm.
- Q. 10 Compare commercial paper with cash credit facility.

- Q. 11 Why is commercial paper not suitable for small companies?
- Q. 12 Why is project financing suitable for financing infrastructure projects?
- Q. 13 How is the risk in project finance is managed?

Capital structure

- Q. 1 What is capital structure?
- Q. 2 Why the value of levered firm (having leverage) is always greater than the value of unlevered firm when corporate profits are taxed?
- Q. 3 Discuss advantages and disadvantages of using equity and debt in the capital structure.
- Q. 4 Total equity capital of ABC Ltd is Rs. 40 Lakh and Debt capital is Rs. 60 Lakh. Cost of equity of ABC Ltd is 14%, cost of Debt is 10% and tax rate is 30%. Calculate weighted average cost of capital.
- Q. 5 Discuss factors affecting the capital structure of the firm.
- Q. 6 What are the elements of capital structure of the firm?
- Q. 7 What are the approaches to decide capital structure of the firm?
- Q. 8 What is the optimum capital structure? Discuss the elements of capital structure.



8

Dividend Policy

Syllabus

Dividend Policy : Meaning and Importance of Dividend Policy; Factors Affecting an Entity's Dividend Decision; Overview of Dividend Policy Theories and Approaches-Gordon's Approach, Walter's Approach, and Modigliani-Miller Approach.

Learning Objectives

- Meaning and Importance of Dividend Policy
- Factors Affecting an Entity's Dividend Decision
- Overview of Dividend Policy Theories and Approaches - Gordon's Approach, Walter's Approach, and Modigliani-Miller Approach

8.1 Introduction to Dividend Policy

- Dividends are payments made by a company to the shareholders of the company. Most dividends are paid in the form of cash. Dividends is the most common approach for distribution of profits to the shareholders, other being buyback of shares or bonus shares. Part of the profit gets distributed to the shareholders.
- Companies can choose to distribute part of the earnings to shareholders and reinvest the balance in the company. The ratio of the dividend and the total profits is called dividend payout ratio and the ratio of reinvested amount to total profits is called as retention ratio.
- Board of directors of a company formulate a dividend policy outlining guidelines of dividend distribution. Dividend policy has the parameters for payment of dividends to shareholders such as frequency, amount, timing of dividend and depends on the financial position of the company.
- It determines the dividend income that equity shareholders will earn, amount of own equity available for business requirements. Dividend policy also shapes role in attaining desired capital structure for the company.

Importance of dividend policy

- Build shareholders trust :** A well communicated dividend policy of the company helps to build shareholders trust, as the policy helps to establish consistency between shareholders' expectations and actual payout.
- Future profits :** Dividend policy signals the expectation of future profits of the company. For example, company making stable dividend payments, raises dividend payout it signals that company expects growth in profits in future.
- Discipline management :** Sound dividend policy provides guidelines for dividend payout and restrict management from taking reckless outlandish investment decisions.
- Influences stock price and value :** Dividend payout is one of the important consideration for valuation of companies, hence a change in dividend policy influences the share price.
- Influence institutional Investors :** Balanced divided dividend policy sends strong signals about the company's capital allocation policy and help attract institutional investors.

8.1.1 Types of Dividend Policy

- Constant dividend policy :** In this policy, the company decides a fixed amount of dividend for the shareholders. In this policy dividend amount does not change periodically.
- Constant payout policy :** In this policy, the company pays a fixed percentage of profit as dividends. The dividend amount grows or declines with change in profits.
- Residual payout policy :** In this policy, the company pays residual amount from profits after accounting for planned capital expenditures.
- Irregular dividend policy :** In this policy, the company does not have fixed amount or schedule for dividend payout and it is at the discretion of the management.
- No dividend policy :** In this policy, company has policy to retain all the profits for reinvestment and does not pay any dividends.

8.1.2 Factors Affecting Dividend Decision

- Legal rules :** Company needs follow the rules and guidelines per the local government. In India, Companies Act, 2013 lays rules for distribution of dividends.
- Funding requirements :** The firm should consider the funding requirements and cash flow position of the company to decide the dividend decision. For this purpose, projected cash flows are of particular importance.
- Investment opportunities :** One of the significant factors of affecting dividend decision is availability or lack of investment opportunities.



- Firm having attractive investment opportunities are likely to postpone dividend payments to future period and reinvest earnings in the business, while firms lacking good investment opportunities will like to have higher payouts.
- **Contractual restrictions :** Many times loan agreements with lenders restrict the dividend payment to shareholders, companies need to comply with such restrictions while announcement of dividends.
- **Liquidity position :** Liquidity of a company is an important consideration in many dividend decisions. Greater the cash position and overall liquidity of a company, the greater its ability to pay a dividend. In the low interest rate environment firms may prefer to borrow funds and be more liberal in dividend payout.
- **Access to capital market :** Firms having easier access to long term capital markets are less dependent on internal funds and are more flexible in dividend decisions.
- **Stage of the business :** In the growth stage, business needs funds for investment and will like to reinvest more profits for growth and limit the dividend payout. In the mature stage, company's investment requirement is limited and they are likely to pay higher dividend payout.
- **Stability of earnings :** Companies having stable earnings profile are likely to have larger dividend payout, compared to companies having large fluctuations in earnings. Hence, companies in the industries such as utilities e.g. NTPC Ltd or fast moving consumer goods companies e.g. Hindustan Unilever Ltd are likely to have larger dividend payout compared to cyclical companies like Tata Motors Ltd.
- **Type of Industry :** Some industries are highly cyclical and show large fluctuations in demand, while some industries have periodic investment requirements due to technological changes. Companies operating in such industries are likely to have low dividend payout to safeguard against uncertainty.

8.1.3 Dividend Policy Theories

- We had studied in earlier chapters that equity investors earns returns in the form of dividend income and capital gain.
- When a company declares the dividend, equity shareholders receive the income in current period. When a company chooses to reinvest the earnings, equity investors expect to earn from capital gains in future.
- Some theories propose that the company's dividend policy has an impact on share price of the company, while Miller-Modigliani propose the irrelevance of dividend income and share price. Let's study.

8.1.4 Dividend Discount Models (DDM)

We understood from the concept of present value that value of any asset is the present value of net cash flows generated from the asset. Dividend discount model share price is worth the sum of present value all of its future dividend payments. It can be shared as follows :

$$P_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots + \frac{D_n}{(1+k)^n}$$

Where

P_0 - Price per share

D_1, D_2, D_n - Dividend per share per year

r - Cost of capital

Dividend discount model has two popular variations i.e. Gordon's model and Walter's model.

8.1.5 Walter's Model

Walter's model of dividend policy proposes that the dividend policy of the company has an impact on the share price of the company. According to the model proposed by James Walter, market value of company's shares depend on dividend payout ratio, internal rate of return and cost of capital for the company.

Assumptions

Walter's model is based on following assumptions.

- **Internal financing** : All investments of the firm are financed from retained earnings of the company. New equity financing is not available.
- **Constant return and cost of capital** : Company's internal rate of return and cost of capital are constant.
- **Constant earnings and dividend per share (EPS) and (DIV)** : Earning per share and dividend per share of the company are constant.
- **Infinite life** : Company has infinite life.
- **100% payout or 100% retention** : Company either distributes 100% of profit or reinvests 100% profit amount.

According to Walter's model market value per share is sum of present value of all future dividend per share and present value of gains on investments from retained earnings.

Formula : Market price per share (P_0) = $\frac{D}{k} + \frac{(E - D) \times r}{k}$



Where,

P - Market price per share

D - Dividend per share

k - Cost of capital of the firm

E - Earnings per share

r - Internal rate of return of the firm.

Illustration

The earnings per share of company are and the rate of capitalization applicable to the company is 10 and 12% respectively. The company is evaluating an option to adopt a payout ratio of 50% or 75%. Using Walter's formula of dividend payout, calculate the market value of the company's share if the internal rate of return is 15%

Answer

Using Walter's formula

- For payout ratio 50% and RoE of 15%

$$\text{Dividend per share} = 10 \times 0.5 = 5$$

$$\text{Price per share } P = \left(\frac{5}{0.12} \right) + \frac{\left(\frac{0.15 \times (10 - 5)}{0.12} \right)}{0.12}$$
$$= 42 + 52 = 94$$

- For payout ratio of 75% and RoE of 15%

$$\text{Dividend per share } 10 \times 0.75 = 7.5$$

$$\text{Price per share } P = \left(\frac{7.5}{0.12} \right) + \frac{\left(\frac{0.15 \times (10 - 7.5)}{0.12} \right)}{0.12}$$
$$= 62 + 26 = 88$$

As the internal rate of return is higher, higher is the retention ratio, higher the retention higher will be the share price. In fact share price will be maximized when the retention ratio is 100%.

Implications of Walter's model

- For growth firms :** In case of growth firms internal rate of return (r) > cost of capital (k), shareholders of such firms will maximize value by reinvesting all the earnings. The optimum payout ratio for such firms is zero.
- For normal firms :** In case of normal firms, internal rate of return (r) is equal to cost of capital (k). For such firms dividend policy has no impact on share policy and dividend payout ratio is optimum.

- **For declining firms :** In case of declining firms internal rate of return (r) is less than cost of capital (k). Shareholders of such firms will prefer to have 100% payout ratio as they can invest the dividends elsewhere for better returns.

Limitations of Walter's model

- **No external financing :** Walter's assumption of no external financing is not practical. In real world, companies have access to external financing.
- **Constant rate of return and cost of capital :** Walter's assumption of constant cost of capital and internal rate of return for the entire life of company is unrealistic. Company's marginal cost of capital or rate of return are subject to change with more competition in real world.

8.1.6 Gordon's Model

Myron Gordon's model proposes that the market value of the shares is sum of present value of all future stream of dividends.

Gordon's model is based on the assumption that the stream of future dividends will grow at some constant rate in the future for an infinite time. The model is helpful in assessing the value of stable businesses with strong cash flow and steady levels of dividend growth.

Gordon's model is based on following assumptions:

- **Internal financing :** All investments of the firm are financed from retained earnings of the company. New equity financing is not available.
- **Constant return and cost of capital :** Company's internal rate of return and cost of capital are constant.
- **Constant retention :** Company's retention ratio i.e. ratio of retained earnings to profits is constant.
- **Constant rate of growth :** Company's earnings are growing at constant rate of growth.
- **Infinite life :** Company has infinite life.
- **Cost of capital is greater than rate of growth :** Cost of capital of the firm is greater than rate of growth.
- **No taxes :** There are no taxes on earnings.

$$P_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots + \frac{D_\infty}{(1+k)^\infty}$$

$$P_0 = \frac{D(1+g)}{(1+k)} + \frac{D(1+g)^2}{(1+k)^2} + \frac{D(1+g)^3}{(1+k)^3} + \dots + \frac{D(1+g)^\infty}{(1+k)^\infty}$$

where,

P - Price per share

D - Dividend per share



g - Rate of growth in dividend

k - Cost of capital

► **Formula :** $P_0 = \frac{D(1 + g)}{(k - g)} = \frac{D_1}{(k - g)}$

Dividend = Earnings per share \times Payout ratio

Payout ratio is $1 - \text{retention ratio}$ i.e. $1 - b$, where b is the retention ratio.

► **Formula :** $P_0 = E_1 \frac{(1 - b)}{(k - g)}$

Growth rate g can be estimated using return on equity and retention ratio

$$g = \text{ROE} \times \text{Retention ratio} = \text{ROE} \times b$$

Earnings per share can be expressed as Assets per share (A) \times Rate of return (r) or

$$E_1 = r \times A$$

Illustration

A Company has total assets of Rs.500,000 divided into 10,000 shares with face value of Rs.10 per share. Company has policy of 50% payout ratio and capitalization rate of 12% and return on assets of 15%. Using Gordon's method, calculate the market value of the company's share.

Answer

$$\begin{aligned} \text{As per Gordon's model, share price } P &= \frac{D_1}{(k - g)} \\ &= \frac{E_1 (1 - b)}{(k - g)} \\ E_1 &= r \times A = \frac{(0.15) \times (500,000)}{10,000} = 7.5 \\ g &= b \times r = 0.50 \times 0.15 = 0.075 \text{ or } 7.5\% \\ P &= \frac{7.5 (1 - 0.5)}{(0.12 - 0.075)} \\ &= \frac{3.75}{0.045} \\ P &= 83 \end{aligned}$$

Price per share is Rs. 83.

Implications of Gordon's model

- **For growth firms :** In case of growth firms internal rate of return (r) $>$ cost of capital (k), market price of share (P_0) will increase with increase in retention ratio (b).

- **For normal firms :** In case of normal firms, internal rate of return (r) is equal to cost of capital (k). For such firms, dividend policy has no impact on share policy.
- **For declining firms :** In case of declining firms internal rate of return (r) is less than cost of capital (k), value of firm will decline with increase in retention ratio (b).

Limitations of Gordon's model

- **No external financing :** Walter's assumption of no external financing is not practical. In real world, companies have access to external financing.
- **Constant rate of return and cost of capital :** Walter's assumption of constant cost of capital and internal rate of return for the entire life of company is unrealistic. Company's marginal cost of capital or rate of return are subject to change with more competition in real world.

8.1.7 Dividend Irrelevance - Modigliani - Miller Approach (MM)

Modigliani Miller approach put forth by Franco Modigliani and Merton Miller in 1961 states that dividend decisions are irrelevant for the share of the company. According to this theory price of share is only influenced by earnings per share.

Assumptions of the model

- **Perfect capital markets :** This model assumes that the capital markets are perfect i.e. all investors have access to free information, all investors are rational, there are no flotation or transaction costs.
- **No taxes :** There are no corporate taxes, alternatively both dividend and capital gains are taxed at same rate.
- **Investor is indifferent between dividend income and capital gains :** It is assumed that investor is indifferent between dividend income and capital gain income and only concerned about total income.
- **No risk or uncertainty :** All the investors can forecast future market prices and dividends with certainty and risk of uncertainty does not exist. This means that discount rate is same for all securities and for all periods.
- **Investment policy :** The firm has fixed investment policy

Price per share as per MM approach is

$$P_0 = \frac{D_1 + P_1}{1 + k}$$

► **Formula :** $P_1 = P_0(1 + k) - D_1$

where,

P_1 = Market price of the share at the end of a period



P_0 = Market price of the share at the beginning of a period

k = Cost of capital

D_1 = Dividends received at the end of a period

Limitations of Modigliani - Miller Theory

- Perfect capital markets do not exist, information asymmetry exists. Taxes are present in the capital markets.
- According to this theory, there is no difference between internal and external financing. However, issuance of new securities involves floatation costs.
- Taxes are present, further is most of the markets capital gains and dividends are taxed differently.

Review Questions

- Q. 1** Why is it important to have a dividend policy for a firm?
- Q. 2** Elaborate the factors affecting dividend policy.
- Q. 3** A firm is expected to declare a dividend of Rs.10 next year and has a payout ratio of 60%. Company internal rate of return is 16% and cost of capital 12%. Calculate the market price of share using Gordon's model.
- Q. 4** What are the assumptions of MM theory on dividend policy?