University of Global Village
Department of Business Administration

Course Title: Financial Management

Course Code: 0412-621	**Credit: 03**
Semester End Exam (SEE) Hours : 03	**CIE Marks : 90** **SEE Marks : 60**

❖ **Course Learning Outcomes: At the end of the Course, the Student will be able to-**

CLO 1	Understanding finance concepts to evaluate the financial implications of relevant business decisions.
CLO 2	Identify the sources of long, medium- and short-term funds.
CLO 3	To educate the importance of determining the risk and return of various investment assets.
CLO 4	Utilize time value of money principles to value investment.
CLO 5	Determine the cost of capital.
CLO 6	Explain and apply the theory capital budgeting technique and Leverage

Course Plan Specifying content, Teaching Times and CLOs

SL	Contents of Course	Hrs.	CLOs
1	**Introduction to Finance:**	6	CLO1
2	**Sources of Funds (Introduction)**	7	CLO1
3	**Risk and Return**	6	CLO3
4	**Time Value of Money**	6	CLO4 CLO5
5	**Cost of Capital**	6	CLO5
6	**Capital budgeting Technique**	6	CLO6
7	**Leverage**	5	CLO6

Course plan specifying content, CLOs, teaching learning and assessment strategy mapped with CLOs:

Week	Topic	Teaching Learning Strategy	Assessment Strategy	Corresponding CLOs
1	**Introduction to finance:** #Concept of Finance # Features of Finance # Role of Finance #Principles of Finance #Need of Finance # Major Area of Finance **Categories of Finance** # Personal Finance # Key Areas of Personal Finance # Corporate Finance	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Written Exams ▪ Question & Answer (Oral)	**CLO1**
2	**Categories of Finance** # key Areas of Corporate Finance # Public Finance# Key Areas of Public Finance **Financial Management** *Meaning of Financial management * Scope of financial Management *Objective of Financial management *Functions of Finance manager	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral) ▪ Presentation	**CLO1**
3	**Sources of Funds** # The Financial need of a Business # Commercial paper # Factors Affect the Choice of sources of Funds # Classification of sources of Funds **Short term Sources** Concept of Trade Credit # Merits and Limitations of Trade credit Financing # Factoring and its merits and limitations # Bank Overdraft and its merits and limitations # Bills financing and its merits and Limitation	▪ Lecture ▪ Discussion	▪ Question & Answer (Oral) ▪ Quiz ▪ Assignment	**CLO2**
4	**Short term Sources** # Bank Overdraft and its merits and limitations # Bills financing	▪ Lecture ▪ Discussion ▪ Problem	▪ Written exam ▪ MCQ test	**CLO2**

	and its merits and Limitation # Concept of Commercial paper # Merits and Limitations s of commercial papers	Solving	▪ Oral test	
5	**Medium Sources of funds** # Higher Purchase Financing Agreement (HPFA) # Merits and limitation (HPFA) # lease financing and its merits and Limitations. **Long terms Sources of Finance** # Equity vs debt financing # Common Stock # Merits and Limitations of Common Stock. # Preferred Stock financing # Merits and limitation of Preferred Stock # Bond financing	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral) ▪ Assignment	**CLO2**
6	**Risk and Return** # Concept of Return # Components of Return # Meaning Total Return # Calculation of Total return # Meaning of Expected Return # Calculation of Expected Return # Meaning # Meaning and calculation of Inflation adjusted return.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral)	**CLO3**
7	**Risk and Return** Meaning # Meaning and calculation of Inflation adjusted return. **Types of Risks** # Meaning of Risks # interest rate Risk with example # Financial Risk with example # Liquidity Risk with example #Exchange rate risk with example # Country Risk	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral) ▪ Class Test	**CLO3**
8	**Risk of Single Assets** # Meaning of Scenario analysis # Concept of Range # Calculation of Range # Meaning of Standard Deviation # Calculation of Standard Deviation.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Written Exams ▪ Class Test	**CLO3**
9	**Time Value of Money**	▪ Lecture	▪ Written	

	# Meaning of Time value of Money # Time Line # Basic pattern of Cash flows # Meaning of Present Value and Future Value # Compounding and discounting # Simple and compound interest. **Single amount Cash flows** # Calculation of Future value of Single amount # Calculation Present Value of single amount	▪ Discussion ▪ Problem Solving ▪ Exercise ▪ Assignment	Exams ▪ Class Test	
10	**Annuity and Mixed Stream Cash Flows** # Concept of Annuity # Calculation of present value of Annuity # Calculation Present Value of Annuity. # Calculation of present value of Single amount # Calculation Present Value of single amount # Calculation Future value of mixed streams # Calculating nominal and Effective Annual Rate.	▪ Lecture ▪ Discussion	▪ Question & Answer (Oral)	**CLO4**
11	**Cost of Capital (Introduction)** # Meaning of Cost of capital # Characteristics of cost of capital # Factors Affecting Costs of Capital # Importance of cost of capital # Risk related to cost of capital. **Cost of Debt** # Meaning of cost of debt #Computation of cost of debt.	▪ Lecture ▪ Discussion ▪ Problem Solving ▪	▪ Question & Answer (Oral) ▪ Class Test ▪ Written Exams	**CLO4**
12	**Cost of Preferred Stock and Common Stock** #Meaning and calculation of Cost of Preferred stock # Meaning of cost of Common stock #Computation of common stock.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ MCQ test ▪ Oral test	**CLO5**
13	**Cost of Retained Earnings, CAPM and WACC** # Concept of CAPM # Calculation	▪ Lecture ▪ Discussion ▪ Problem	▪ Question & Answer (Oral)	**CLO5**

	of CAPM # Calculation of Cost of Retained Earning # Calculation of cost of new common stock # Weighted Average cost of Capital	Solving	▪ Class Test	
14	**Capital budgeting Technique** # Concept of Capital budgeting # Capital Budgeting process # Independent vs Mutually Exclusive Project # Unlimited Funds Vs. Capital Rationing # Accept Vs Ranking of the project # Introduction to Capital budgeting Methods.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral)	**CLO5**
15	**Pay Back Period and NPV** Concept Payback Period. * Pros and Cons of Payback. * Calculation of Payback Period. * Decision Making rules. Concept of NPV # Calculation of NPV # decision rules for NPV.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral) ▪ Written Exams	**CLO6**
16	**IRR and Profitability Index (PI)** # Concept Internal Rate of return. # Calculation of IRR. # Decision criteria. # Comparing NPV and IRR Technique. #Concept Profitability Index (PI) # Calculation of PI. # Decision criteria.	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral)	**CLO6**
17	**Leverage** Concept of Leverage, Importance of leverage , Types of Leverage, Break even analysis, Fixed cots and variable costs Concept and Calculation of Operating leverage, financial Leverage and its calculation and combined leverage	▪ Lecture ▪ Discussion ▪ Problem Solving	▪ Question & Answer (Oral) ▪ Written Exams	**CLO6**

Mapping of Course Learning Outcomes to Program Learning Outcomes-

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CLO 1	3	3	2	2	3	1
CLO 2	3	3	3	3	3	2
CLO 3	2	3	3	3	3	3
CLO 4	2	2	3	3	3	3

CLO 5	3	3	2	2	3	1
CLO 6	2	3	3	3	3	3

Assessment and Evaluation

1) **Assessment Strategy:** Group Discussion, Class tests, Case Study, Term Paper, Presentation.

2) **Marks distribution:**

a) **Continuous Assessment:**

- Class attendance is mandatory. Absent of 70% classes; disqualify the student for final examination only authority recommendation will be accepted with highly reasonable causes.
- Late submission of assignments is not allowed. Late submission of assignments will be only taken with highly reasonable causes and 20% mark will be deducted.
- To pass this course student will have to appear mid-term and final examination.

b) **Summative:**

CIE- Continuous Internal Evaluation (90 Marks)

Bloom's Category Marks (out of 90)	**Quiz** (15)	**Assignments** (15)	**Attendance** (15)	**Mid Term Examination** (45)
Remember				10
Understand	05	05		05
Apply	05			10
Analyze		05		05
Evaluate	05	05	15	10
Create				05

SEE- Semester End Examination (60 Marks)

Bloom's Category	**Test**
Remember	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	10

Grading Policy: University of Global Village

Marks	Grade	Grade Point	Remarks

80 - 100%	A+	4.00	Outstanding
75 - 79%	A	3.75	Excellent
70 - 74%	A-	3.50	Very Good
65 -69%	B+	3.25	Good
60 - 64%	B	3.00	Satisfactory
55 - 59%	B-	2.75	Above Average
50 - 54%	C+	2.50	Average
45 - 49%	C	2.25	Below Average
40 - 44%	D	2.00	Pass
0 - 39%	F	0.00	Fail

3) **Make-up Procedures:** Dates for exams will be strictly followed. No makeup exam (Normal case), for exceptional case university rules and regulation should be followed.

RECOMMENDED TEXT BOOKS:

[1] Ross, S. A., Westerfield, R., & Jaffe, J. F. (1999). Corporate finance. Irwin/McGraw-Hill.
[2] Gitman, L. J. (2000). Principles of managerial finance: brief. Addison Wesley.

Reference Books:

[3] Pascal, Q., Maurizio, D., & Antonio, S. (2009). Corporate Finance-Theory and Practice.
[4] Skae, F. O. (2014). Managerial finance. LexisNexis.

Week 1 & 2

Chapter 1
Introduction to Finance

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Chapter Outlines

At the end of the chapter, students will be able to -

- Understand the Meaning of Finance
- Explain the Roles of finance in Organization
- Recognize the Principles of Finance
- Describe the Need of Finance in Business.
- Elaborate the Types of finance
- Define Financial Management.
- Scope of financial management
- Objectives of financial management
- Role of a finance manager.

Concept of Finance

Khan and Jain, —Finance is the art and science of managing money.

Business Finance can be broadly defined as the activity concerned with planning, raising, controlling and administering of funds used in the business. ”
Guthmann and Douglas..

Features of Finance

- Deals with financial aspect.
- Needs proper planning & control.
- Objective oriented activity.
- Major aspect of business management
- Collected from different sources
- Concerned with estimation, collection and utilization of funds

Role of Finance

It affects the survival, profitability and growth of the firm.

It is necessary for the promotion of an organization.

It ensures orderly functioning of an organization.

Expansion, modernization and diversification is possible only when there are adequate funds available.

It supports other functional areas of a business.

It helps in meeting the objective of wealth maximization.

Finance helps firms solve business problems.

Principles of Finance

Full Utilization of Funds

Maximization of Return on Investment

Survival and Prosperity of business unit

Fair balance between Liquidity & Profitability

Good Public Image

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Need of Finance

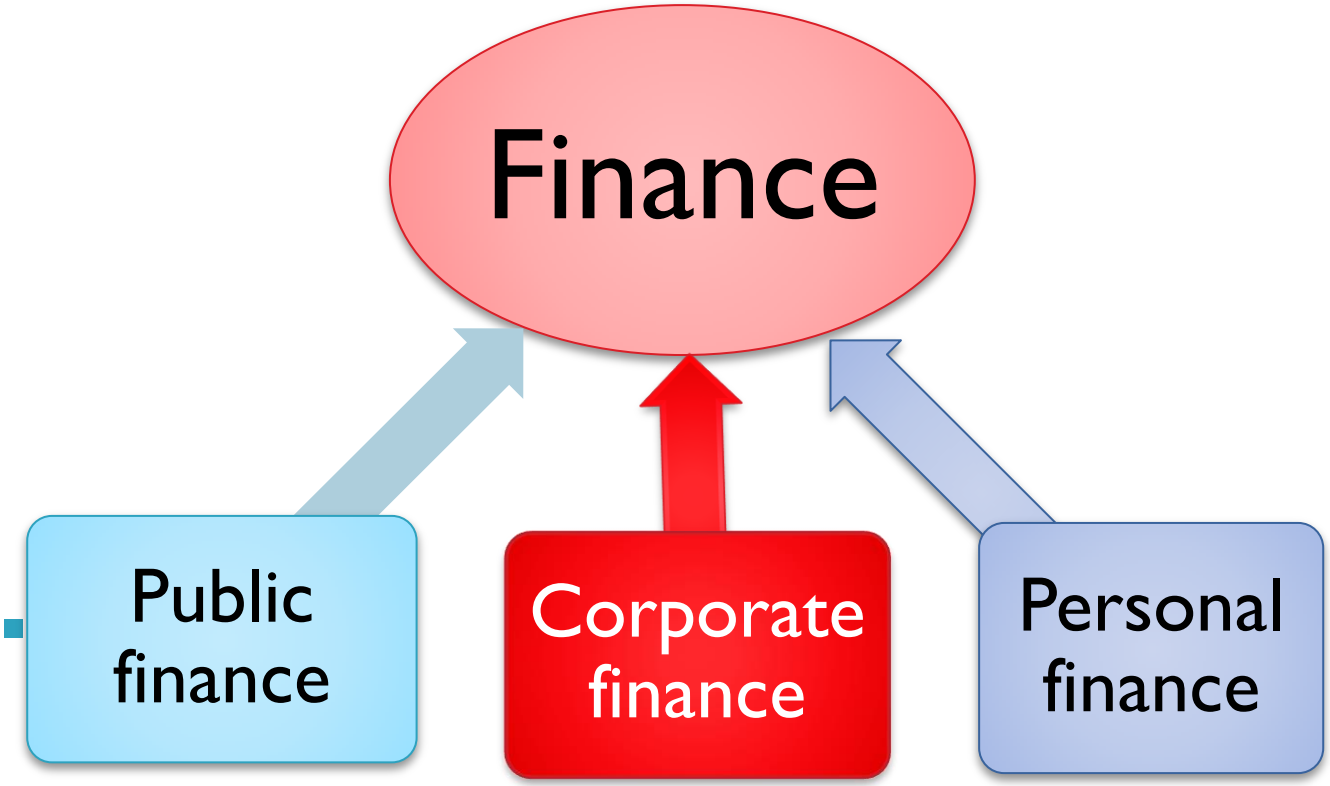
Fixed Capital Requirement

- Fund required to purchase fixed assets.
- Such as building machinery, Equipment etc.

Working Capital Requirement

- Amount required for day to day operations that means "working capital".
- Such as purchasing stationaries, paying electricity bills etc.

Finance Categories



Public Finance

Public Finance is the study of the role of the government in the economy through:

- Efficient allocation of resources. (Example: Taxes & Borrowings).
- Distribution of Income. (Example: Education, Transportation, Security & Healthcare).
- Stabilization. (Example: Policies to address inflation & unemployment).

Key areas of Public Finance

1. **Public Revenue:** It includes taxes, imports on duties, tariffs, indirect taxes, penalties, fees, maintenance, etc.
2. **Public Expenditure:** Expenses on activities, including infrastructure, medical and healthcare facilities, technology, education, and more.
3. **Public Debt:** When expense exceeds revenue, the government can resort to public debt to meet the basic requirements of the citizens of the country.
4. **Financial Administration:** Financial administration refers to the management of public finances. These include the expenditure for maintaining cultural heritage, general electives, and more.

Corporate Finance

Concept of Corporate Finance

- The financial activities related to running a corporation through overseeing the financial activities of a company.
- Corporate finance is primarily concerned with maximizing shareholder value through long-term and short-term financial planning and the implementation of various strategies.

Corporate Finance

Key Areas of Corporate Finance

- ✓ **Investment Decisions:** Where Management must allocate limited resources between competing opportunities (projects).
- ✓ **Financing Decisions:** To ensure that any corporate investment is financed properly.
- ✓ **Dividend Decisions:** Whether to issue dividends, and what amount, and the form of the dividend distribution; cash or shares.

Personal Finance

Concept of Personal Finance

- All financial decisions and activities of an individual, it includes budgeting, insurance, savings, investing, debt servicing, mortgages and more. Personal finance is concerned with answering questions like:
- How can people protect themselves against unforeseen personal events?
- How can family assets best be transferred across generations
- How does tax policy affect personal financial decisions
- How does credit affects the financial position?

Personal Finance

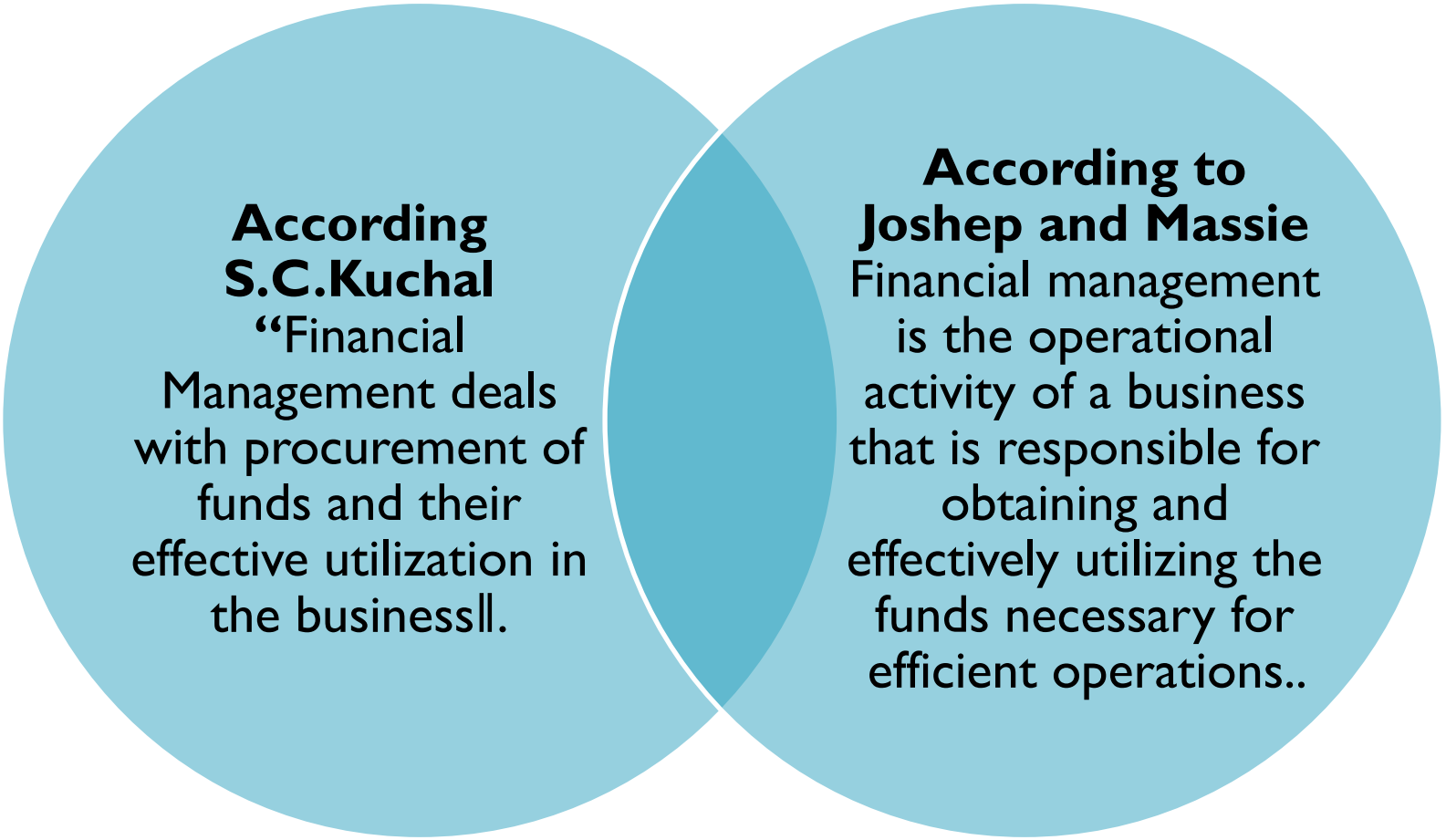
Key areas Personal Finance

- **Financial Position:** Concerned with understanding personal resources available to cover personal wants & needs.
- **Protection:** Concerned with the analysis of how to protect a household from unforeseen risks. (liability, property, death, disability, health and long term care).
- **Tax planning:** Concerned with handling legally the payment of the least possible tax on income.

Personal Finance

- **Investments:** Concerned with investing to create future wealth (Stocks, Bonds & Reals Estate)
- **Retirement Planning:** Concerned with understanding how much it costs to live at retirement and plan for it.
- **Assets Planning:** Concerned with planning for the disposition of one's assets after death.

What is Financial Management ?



Scope of Financial Management

Financial Management and Economics

- Economic concepts like micro and macroeconomics are directly applied with the financial management approaches

Financial Management and Accounting

- Accounting records includes the financial information of the business concern.

Financial Management and Mathematics

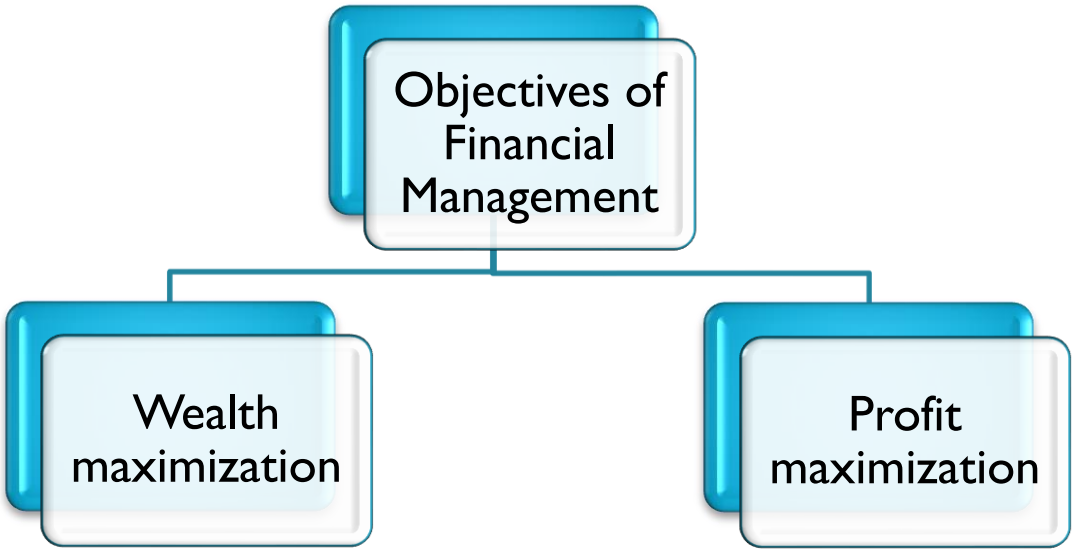
- Modern approaches of the financial management applied large number of mathematical and statistical tools and techniques.

Scope of Financial Management

4. **Financial Management and Production Management:** Production performance needs finance, because production department requires raw material, machinery, wages, operating expenses etc.
5. **Financial Management and Marketing:** Marketing department needs finance to meet their requirements. The financial manager or finance department is responsible to allocate the adequate finance to the marketing department
6. **Financial Management and Human Resource:** Financial management is also related with human resource department, which provides manpower to all the functional areas of the management.

Objectives of Financial Management

- Objectives of Financial Management may be broadly divided into two parts such as-



Functions of Finance Manager

Finance manager performs the following major functions:

1. **Forecasting Financial Requirements:** It is the primary function of the Finance Manager. He is responsible to estimate the financial requirement of the business concern.
2. **Acquiring Necessary Capital:** After deciding the financial requirement, the finance manager should concentrate how the finance is mobilized and where it will be available.

Functions of Finance Manager

3. **Investment Decision:** The finance manager must carefully select best investment alternatives and consider the reasonable and stable return from the investment.
4. **Cash Management:** In resent days cash management plays a major role in the area of finance because proper cash management is not only essential for effective utilization of cash but it also helps to meet the short-term liquidity position of the concern.
5. **Interrelation with Other Departments:** Finance manager deals with various functional departments such as marketing, production, personnel, system, research, development, etc.

Thanks

Week 3, 4 & 5

Chapter 2: Sources of Finance

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Learning objectives

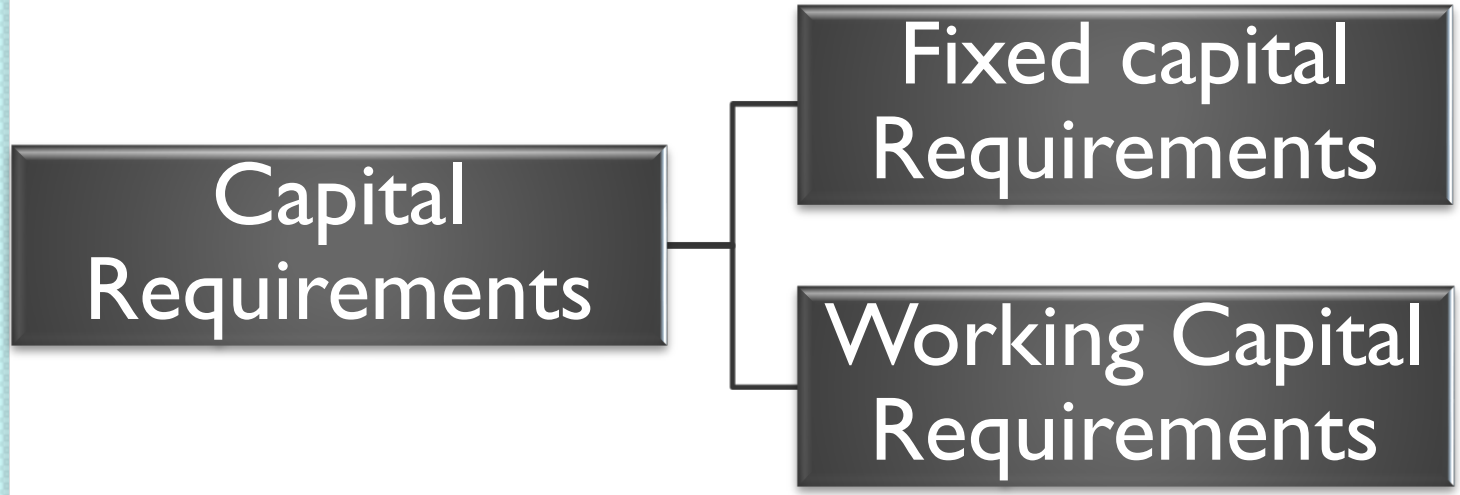
After studying this chapter, should be able to:

- Classify the various sources of business finance;
- Evaluate merits and limitations of various sources of finance;
- Examine the factors that affect the choice of an appropriate source of finance.
- Differentiate the long-term and short-term financing.
- Differentiate between debt based and equity based financing.

Introduction

- A business cannot function unless adequate funds are made available to it. The initial capital contributed by the entrepreneur is not always sufficient to take care of all financial requirements of the business. A business person, therefore, has to look for different other sources from where the need for funds can be met.
- A clear assessment of the financial needs and the identification of various sources of finance, therefore, is a significant aspect of running a business organization.

The financial needs of a business



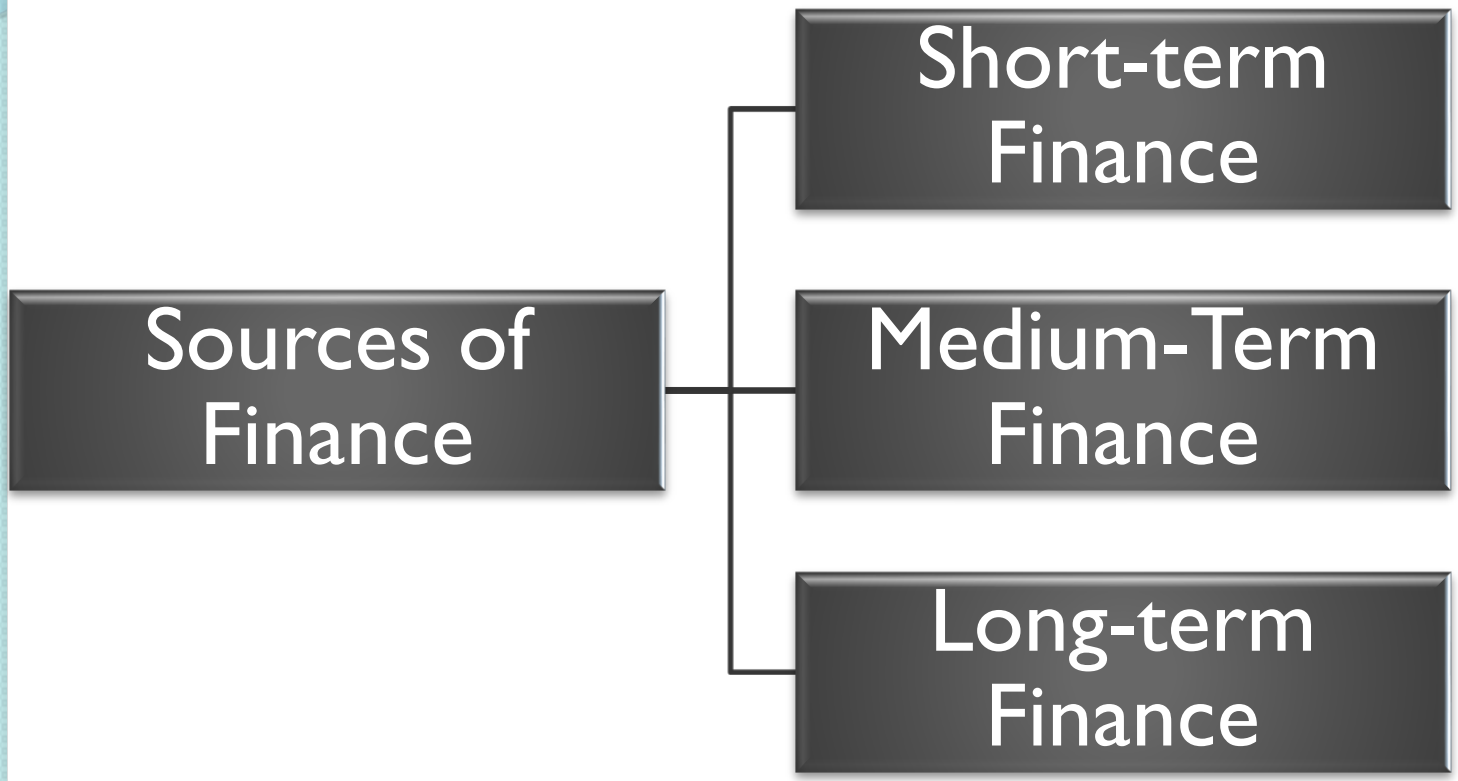
The financial needs of a business

- **Fixed Capital Requirements**: In order to start business, funds are required to purchase fixed assets like land and building, plant and machinery, and furniture and fixtures. This is known as fixed capital requirements of the enterprise. The funds required in fixed assets remain invested in the business for a long period of time.
- **Working capital requirements**: No matter how small or large a business is, it needs funds for its day-to-day operations. This is known as working capital of an enterprise, which is used for holding current assets such as stock of material, bills receivables and for meeting current expenses like salaries, wages, taxes, and rent

Factors Affect the Choice of sources of Funds

- **Cost**
- **Risk profile.**
- **Purpose and time period.**
- **Tax benefits.**
- **Flexibility and ease.**
- **Financial strength and stability of operations.**
- **Form of organization and legal status.**
- **Effect on credit worthiness.,**

Classification of sources of finance



Short-term finance

- Short term financing means financing for a period of less than 1 year.
- The need for short-term finance arises to finance the current assets of a business like an inventory of raw material and finished goods, debtors, minimum cash and bank balance etc.
- Short-term financing is also named as working capital financing

Short-term financing instruments

- **Trade Credit**: Trade credit is the credit extended by one trader to another for the purchase of goods and services. Trade credit facilitates the purchase of supplies without immediate payment. Such credit appears in the records of the buyer of goods as 'sundry creditors' or 'accounts payable'.

Merits

- (i) convenient and continuous source of funds;
- (ii) may be readily available in case the credit worthiness of the customers.
- (iii) Trade credit needs to promote the sales of an organization; (iv) It does not create any charge on the assets of the firm while providing funds.

Short-term financing instruments

Limitations

- (i) Less Flexible
- (ii) limited amount of fund available.

Short-term financing instruments

Factoring

- Factoring is a type of finance in which a business would sell its accounts receivable (invoices) to a third party to meet its short-term liquidity needs. Under the transaction between both parties, the factor would pay the amount due on the invoices minus its commission or fees.

Merits

i) factoring is cheaper than financing through other means such as bank credit;

ii) Factoring as a source of funds is flexible and ensures a definite pattern of cash inflows from credit sales.

iii) It does not create any charge on the assets of the firm;

Short-term financing instruments

Limitations

i) This source is expensive when the invoices are numerous and smaller in amount;

ii) Advance finance provided by the factor firm is generally available at a higher interest cost than the usual rate of interest.

iii) The factor is a third party to the customer who may not feel comfortable while dealing with it

Short-term financing instruments

Bank Overdraft

The source of overdraft is commercial banks, and they grant this to creditworthy firms. Funds could be advanced to such firms within a period ranging between one day and one year. These loans are supposed to be repaid on self-liquidating basis (paying from proceeds which accrue from normal course of business operations).

Merits

i) Save Time and Papers.

ii) Perfect for Mismatch of Cash.

iii) Enables on time Payments.

iv) Provide Convenience.

Short-term financing instruments

Bill Financing

It is **a binding short-term financial instrument that mandates one party to pay a specific sum of money to another at a predetermined date or on-demand**. Also known as a bill of exchange, it essentially denotes, in writing, that one person (debtor) owes money to another (creditor).

Merits

- Legitimate Proof of debt
- Can be discounted before maturity.
- Faster means of raising finance.
- Unconditional Negotiable instruments

Short-term financing instruments

Limitations

- Funds are limited .
- Can be availed only large companies.
- Market is Impersonal.

Short-term financing instruments

Commercial Paper

It is a short term unsecured promissory note issued by corporates and financial institutions at a discounted value on face value. They come with fixed maturity period ranging from 1 day to 270 days.

Merits

1. Commercial paper can be a cheaper.
2. Commercial paper is a flexible source of funding that can be used for a variety of purposes.
3. Maturities are relatively short,
4. Commercial paper is an efficient way of rising money.

Short-term financing instruments

Limitations

1. Commercial paper is unsecured, which makes it a higher-risk investment than other types of debt.
2. Commercial paper is a short-term solution for funding needs and does not provide the stability of longer-term debt instruments.
3. Commercial paper is only available to large organizations with high credit ratings.
4. The commercial paper market can be volatile, as investors can quickly lose confidence in issuers.

Medium-term financing

- Medium term refers to the time period of more than 12 months but less than five years. It deals with fairly larger amounts of money.
- **The purpose is mainly** for lower Capital Expenditure. Most medium-term finance is used to purchase cheaper Fixed Assets such as machinery, equipment, vehicles, etc.

Medium-term financing instruments

Hire purchase Finance Agreement

It is an arrangement for buying expensive consumer goods, where the buyer makes an initial down payment and pays the balance plus interest in installments. The term hire purchase is commonly used in the United Kingdom and it's more commonly known as an installment plan in the United States.

Merits

1. Easy to get
2. Fixed interest rate.
3. Cheaper than personal loan.
4. Installment size is not that big

Medium-term financing instruments

Limitations

1. Contract terms can be longer.
2. Hidden fees
3. It is technically still owned by the vendor during the agreement.

Medium-term financing instruments

Lease Financing

- Lease financing is one of the important sources of medium- and long-term financing where the financer takes an asset against periodical payments. The owner of the asset is known as lessor and the financer is called lessee.
- The periodical payment made by the lessee to the lessor is known as lease rental. Under lease financing, lessee is given the right to use the asset but the ownership lies with the lessor and at the end of the lease contract, the asset is returned to the lessor or an option is given to the lessee either to purchase the asset or to renew the lease agreement.

Medium-term financing instruments

Merits

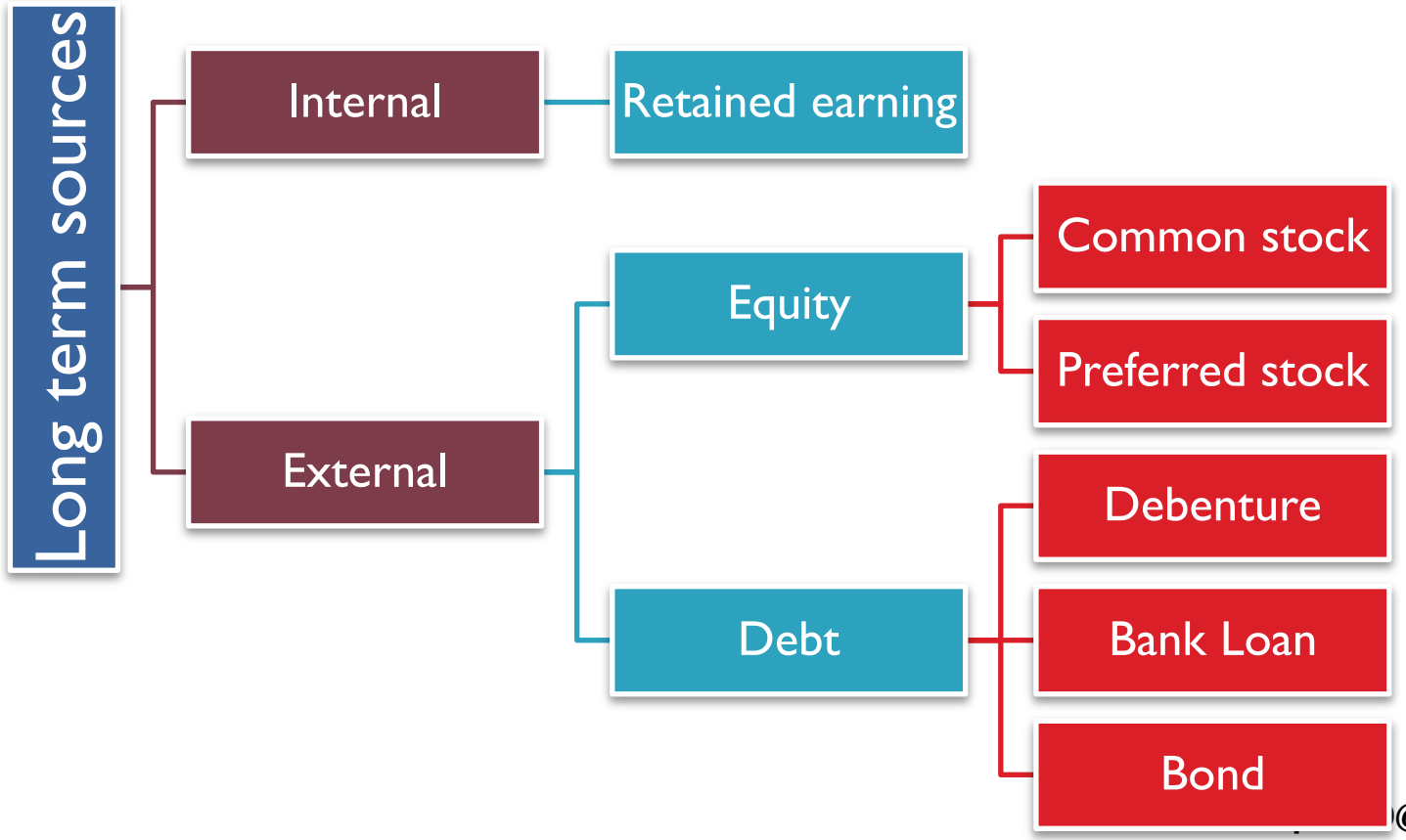
- **Opportunity to use of capital goods.**
- A company is able to enjoy the tax advantage on lease payments as lease payments can be deducted as a business expense**.**
- Less expensive
- Get technical supports from lessee.

Limitations

- A company is able to enjoy the tax advantage on lease payments as lease payments can be deducted as a business expense.
- The lessee will not become the owner of the asset at the end of lease agreement unless he decides to purchase it.
- Cannot be shown as an asset in balance sheet.

Long-term financing

- Long-term finance can be defined as any financial instrument with maturity exceeding five.



Long-term financing Instruments

Common stock

- Common stock financing represents the sale of ownership stakes within a corporation in exchange for cash or capital considerations.
- Investors and management must become familiar with the role of the corporation and the basic means with which to finance the business in order to appreciate shareholder rights and privileges.
- Common stock equity financing does carry distinct risks that are applicable to owners and management.

Long-term financing Instruments

Merits

- Common stock is the source of permanent capital.
- It does not legally obligate the firm to pay dividend.
- It increases the borrowing capacity of the company.
- It is easily marketable than debt and preferred stock.

Limitations

- Transfer of decision making right
- High cost of capital
- Tax burden

Long-term financing Instruments

Preferred stock finance

A source of long term financing which has unique feature unlike common stock . This is because it has fixed cost unlike common stock.

Merits

- No transfer of decision making right.
- Option of huge capital comparatively lower cost.
- Can be convertible is some cases as common stock.

Limitations

- Fixed payment of dividend
- Not tax exempted.
- Some times charges additional dividend upon surplus.

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Long-term financing Instruments

Bond financing

- Bond financing is a type of long-term borrowing that governments and corporation frequently use to raise money, primarily for long-lived infrastructure assets.
- They obtain this money by selling bonds to investors. In exchange, they promise to repay this money, with interest, according to specified schedules.
- The interest the state has to pay investors on the bonds is exempt from their federal and state income taxes, which makes the interest cost on the bonds less than it otherwise would be.

Long-term financing Instruments

Merits

- There is no transfer of ownership in bond
- Flexibility in terms using the bond capital
- Low rate of interest.
- Huge amount of capital.
- Tax exempted.

Limitations

- Fixed cost of capital
- Claim interest before any parties.
- Being highly leverage can be risky.

THANKS

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Week 6, 7 & 8

Chapter 3: Risk and Return

Chapter Outline

- Define and distinguish between risk and return.
- Explain the importance of balancing risk and return in investment decisions.
- Identify and explain different types of risks Introduce measures of risk, such as standard deviation and variance.
- Explain how to calculate returns

Meaning of Risk

The possibility of losing some or all of the original investment.

In other words, the chance of financial loss or, more formally, the variability of returns associated with a given asset.

Types of Risk

Systematic Risk

- Risk inherent to the entire market or market segment. Cannot be eliminated through diversification.
- Examples: Interest rate changes, inflation, recessions, political instability.

Unsystematic Risk

- Risk specific to a single company or industry. Can be mitigated through diversification.
- Examples: Company management, product recalls, regulatory changes

Major types of Risks

Business risk : The chance that the firm will be unable to cover its operating costs. FSR

Financial risk: The chance that the firm will be unable to cover its financial obligations. FSR

Interest Rate Risk: The chance that changes in interest rates will adversely affect the value of an investment. Most investments lose value when the interest rate rises. SSR

Liquidity risk : The chance that an investment cannot be easily liquidated at a reasonable price. SSR

Market risk: The chance that the value of an investment will decline because of market factors that are independent of the investment (such as economic, political, and social events). SSR

Major types of Risks

Event risk : The chance that a totally unexpected event will have a significant effect on the value of the firm or a specific investment. Both

Exchange rate risk: The exposure of future expected cash flows to fluctuations in the currency exchange rate. Both

Purchasing-power risk : The chance that changing price levels caused by inflation or deflation in the economy will adversely affect the firm's or investment's cash flows and value. Both

Tax risk : The chance that unfavorable changes in tax laws will occur. Firms and investments with values that are sensitive to tax law changes are more risky. Both

Risk Preference

Risk preference means attitude of people/ managers/ firm toward risk.

- **Risk-indifferent :** The attitude toward risk in which no change in return would be required for an increase in risk.
- **Risk-averse :** The attitude toward risk in which an increased return would be required for an increase in risk.
- **Risk-seeking :** The attitude toward risk in which a decreased return would be accepted for an increase in risk. Theoretically, because they enjoy risk, these managers are willing to give up some return to take more risk.

Risk of a Single Assets

Scenario Analysis

- An approach for assessing risk that uses several possible-return estimates to obtain a sense of the variability among outcome. One common method involves making worst, expected, and best estimates of the returns associated with a given asset.

Range

- A measure of an asset's risk, which is found by subtracting the pessimistic (worst) outcome from the optimistic (best) outcome.

Risk of a Single Assets

- Let see the following table …

TABLE 5.3 Assets A and B

	Asset A	Asset B
Initial investment	$10,000	$10,000
Annual rate of return		
Pessimistic	13%	7%
Most likely	15%	15%
Optimistic	17%	23%
Range	4%	16%

Risk of a Single Assets

Probability

- The chance that a given outcome will occur.

Probability distribution

- A model that relates probabilities to the associated outcomes. The simplest type of probability distribution is the bar chart, which shows only a limited number of outcome–probability coordinates.

Continuous probability distribution

- A probability distribution showing all the possible outcomes and associated probabilities for a given even

Risk of a Single Assets

FIGURE 5.2

Bar Charts

Bar charts for asset A's and asset B's returns

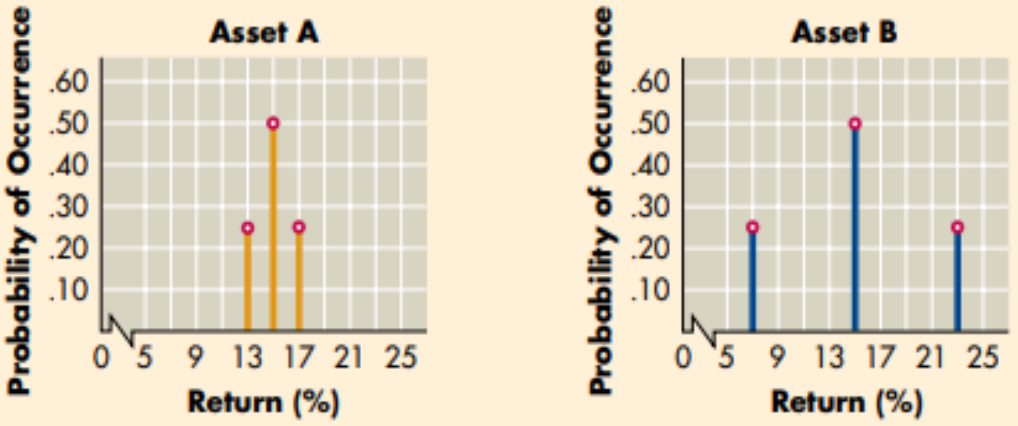
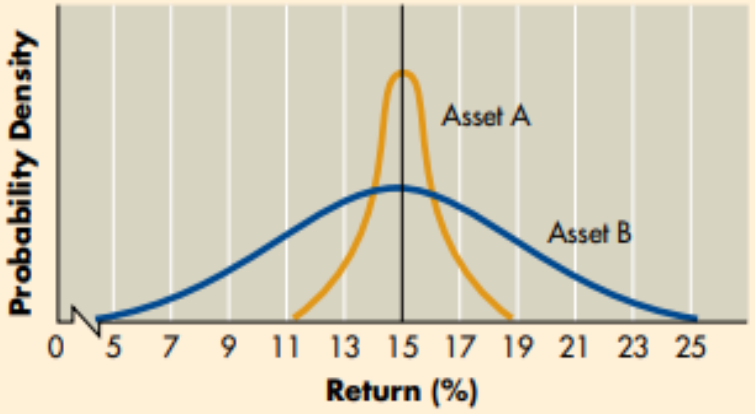


FIGURE 5.3

Continuous Probability Distributions

Continuous probability distributions for asset A's and asset B's returns



Risk of a Single Assets

- **Standard deviation**: The most common statistical indicator of an asset's risk; it measures the dispersion.

$$\text{Standard deviation: } \sigma = \sqrt{\sum_{i=1}^{n} (r_i - \bar{r})^2 x P_{ri}}$$

Where ,
r_i =rate of Return
$\bar{r}$ = Expected/Average Return
P_r =Probability of Return

$$\text{Expected return: } \bar{r} = \sum_{i=1}^{n} r_i \times P_{ri}$$

Where ,
r_i =rate of Return
P_r =Probability of Return

Risk of a Single Assets

- **Example 1:** Calculate Standard Deviation based on following

	Rate of return r_i	Probability P_{ri}
Asset F	0.40	0.10
	0.10	0.20
	0.00	0.40
	–0.05	0.20
	–0.10	0.10

Risk of a Single Assets

- Solution

	Rate of return r_i	Probability P_{ri}	Weighted value $r_i \times P_{ri}$	Expected return $\bar{r} = \sum_{i=1}^{n} r_i \times P_{ri}$
Asset F	0.40	0.10	0.04	
	0.10	0.20	0.02	
	0.00	0.40	0.00	
	–0.05	0.20	–0.01	
	–0.10	0.10	–0.01	
				0.04

Risk of a Single Assets

	$r_i - \bar{r}$	$(r_i - \bar{r})^2$	P_{ri}	σ^2	σ_r
Asset F	0.40 – 0.04 = 0.36	0.1296	0.10	0.01296	
	0.10 – 0.04 = 0.06	0.0036	0.20	0.00072	
	0.00 – 0.04 = –0.04	0.0016	0.40	0.00064	
	–0.05 – 0.04 = –0.09	0.0081	0.20	0.00162	
	–0.10 – 0.04 = –0.14	0.0196	0.10	0.00196	
				0.01790	0.1338

What is Return?

"Income received on an investment plus any change in market price, usually expressed as a percent of the beginning market price of the investment "

Components of Return

- **Yield**

  The most common form of return for investors is the periodic cash flows (income) on the investment, either interest from bonds or dividends from stocks.

- **Capital Gain**

  The appreciation (or depreciation) in the price of the asset, commonly called the Capital Gain (Loss).

Total Return

Total Return = Yield + Price Change

$$TR = [D_t + (P_t - P_{t-1})]/P_{t-1}$$

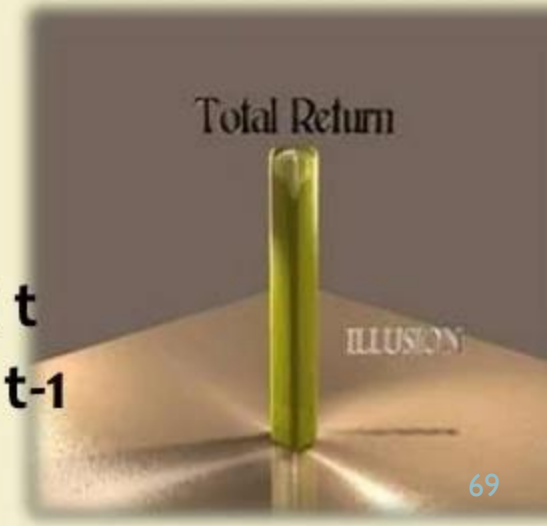
where,

TR = Total Return

D_t = cash dividend at the end of the time period t

P_t = price of stock at time period t

P_{t-1} = price of stock at time period t-1



Example

Ali purchased a stock for Rs. 6,000. At the end of the year the stock is worth Rs. 7,500. Ali was paid dividends of Rs. 260. Calculate the total return received by Ali.

Solution

$$TR = [D_t + (P_t - P_{t-1})]/P_{t-1}$$

Total Return $= \dfrac{\text{Rs.}[260+(7{,}500 - 6{,}000)]}{\text{Rs. } 6{,}000}$

$= 0.293$

$= 29.3\%$

Expected return

- The investor cannot be sure of the amount of return he/she is going to receive.
- There can be many possibilities.
- Expected return is the weighted average of possible returns, with the weights being the probabilities of occurrence

Expected return

Formula:

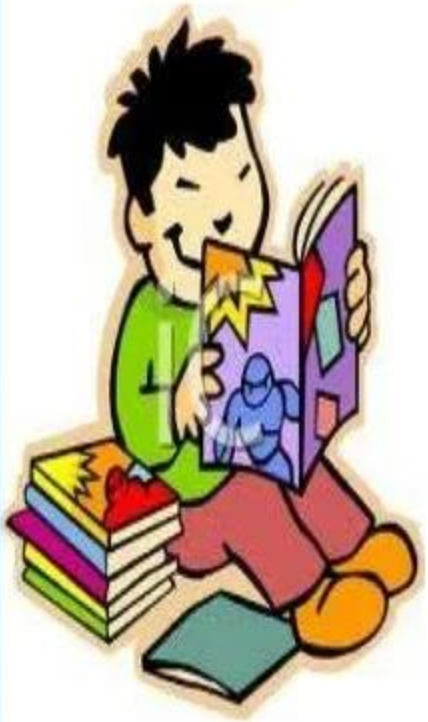
$$E(R) = \Sigma X^* P(X)$$

where **X** will represent the various values of return, **P(X)** shows the probability of various return

Example

Suppose, if you knew a given investment had a 50% chance of earning return of Rs.10, a 25% chance of earning a return of Rs. 20 and there is a 25% chance of bearing a loss of Rs.10.

What is your expected return?



Solution

Return (X)	P(X)	E(X) =X * P(X)
10	0.50	5
20	0.25	5
-10	0.25	-2.5
TOTAL		**7.5**

Relative Return

The relative return is the difference between absolute return achieved by the investment and the return achieved by the benchmark

Example

For example, the return on a stock may be 8% over a given period of time. This may sound rather high,

BUT,

If the return on the designated benchmark is 20% over the same period of time, then the relative return on that stock is in fact -12%.

Inflation adjusted return

- Also called real rate of return
- Inflation-adjusted return reveals the return on an investment after removing the effects of inflation.
- Formula

$$\text{Inflation - Adjusted Return} = \frac{(1+\text{Return})}{(1+\text{Inflation Rate})} - 1$$

Example

- Return on Investment = R = **7%**
- Inflation rate = IR = **3%**
- Inflation Adjusted Return **=?**

Solution:

Inflation Adjusted Return $= [(1+ R)/(1+IR)] - 1$

$= [(1+0.07)/(1+0.03)]-1$

$= 1.03883 - 1$

$= 0.0388$

= 4% approximately

Alternate Solution

- A simple approximation for inflation-adjusted return is given by simply subtracting the inflation rate from the rate of return

- Inflation Adjusted Return = **R – IR**

  = **7% - 3%**

  = **4%**

Week 9 & 10

Chapter : 4 Time Value of Money

Concepts and Calculations

biphos90@

Chapter Objectives

- Define and comprehend the concept of Time Value of Money (TVM) and its significance in financial decision-making.
- Calculate the future value of a sum of money based on different compounding frequencies and interest rates.
- Calculate the present value of future cash flows, considering discounting and different discount rates.
- Analyze and calculate the present and future values of annuities and perpetuities.

The concept of Time Value of Money

- The time value of money is a financial principle that states the value of a dollar today is worth more than the value of a dollar in the future.
- This philosophy holds true because money today can be invested and potentially grow into a larger amount in the future?

You will ask yourself :

- Do I have any thing better to do with that $100 than lending it for $10 extra?
- What if I take $100 now and invest it, would I make more or less than $110 in one year?

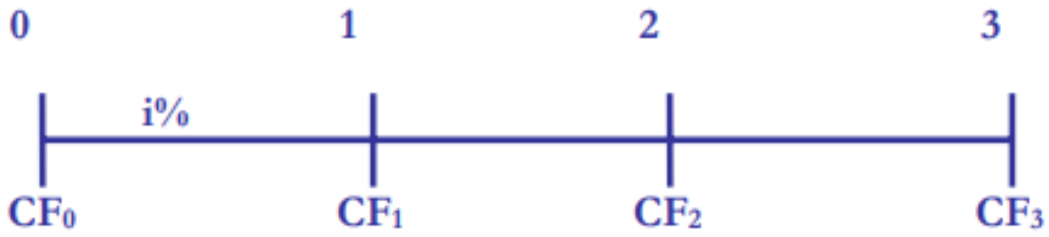
The concept of Time Value of Money

- **Note:** Two elements are important in valuation of cash flows:

1. What interest rate (opportunity rate, discount rate, required rate of return) do you want to evaluate the cash flow based on?
2. At what time do these the cash flows occur and at what time do you need to evaluate them?

Time Lines

- A horizontal line on which time zero appears at the leftmost end and future periods are marked from left to right and; can be used to depict investment cash flows.
- Tick marks occur at the end of periods, so Time 0 is today; Time 1 is the end of the first period (year, month, etc.) or the beginning of the second period.



Basic Pattern of Cash flows

- **Single Cash flows:** A lump-sum amount either currently held or expected at some future date.

Example : Invest 1000 TK today and receive 5000 TK after 5 years.

- **Annuity :** A series of equal cash flows.

Example: Paying out or receiving 1000 TK each year for the next 7 years.

- **Mixed Stream:** A series of Unequal cash flows.

Example: Paying out or receiving 1000 TK first year, 500 TK second year, and 1400 TK for third year.

Some Important concepts

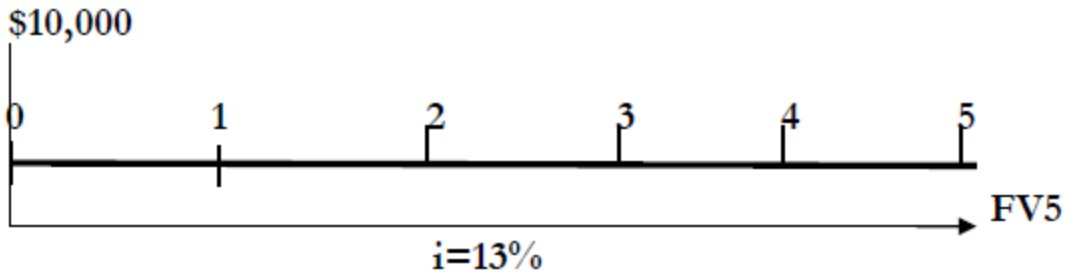
- **Future value:** refers to the estimated worth of an investment at some point in the future based on a certain rate of return. Calculated by applying compound interest over a specific period of time.
- **Compounding**: The Process of finding future value .
- **Principal:** The amount of money on which interest is paid.
- **Compound Interest**: Interest that is earned on a given deposit (principal amount) and has become part of principal at the end of a specific period.

Some Important concepts

- **Simple Interest**: Interest that is earned on a given deposit (principal amount) and has not become part of principal at the end of a specific period.
- **Present Value:** refers to the current value today of an amount of money, or stream of income, to be received at a particular future date.
- **Discounting:** The process of finding present value.

Single Cash Flow (Future Value)

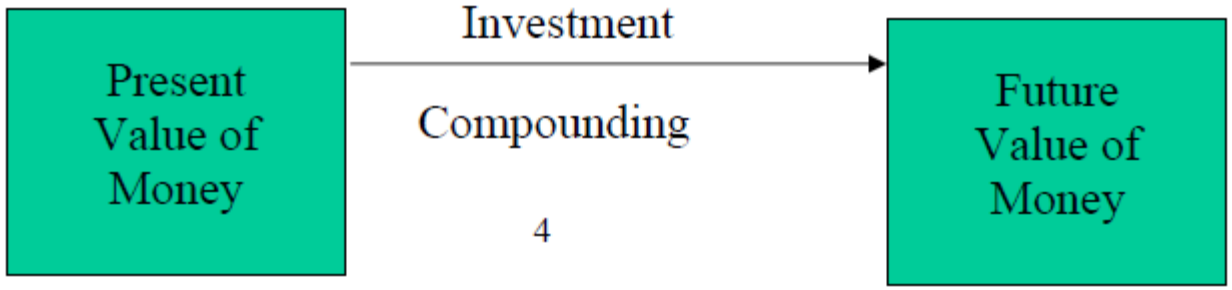
- **Future value** (FV) is the value of a current asset at a future date based on an assumed rate of growth
- You borrowed $10,000 from a bank and you agree to pay off the loan after 5 years from now and during that period you pay 13% interest on loan.



Single Cash Flow (Future Value)

- **Concept of Compounding**

Compounding typically refers to the increasing value of an asset due to the interest earned on both a principal and accumulated interest. This phenomenon, which is a direct realization of the time value of money (TMV) concept, is also known as compound interest.



Single Cash Flow (Future Value)

- **Example 1**: Salman Khan deposited $1000 in saving account earning 6% interest rate semi-annually. How much will Salman Khan money be worth at the end of 3 years?

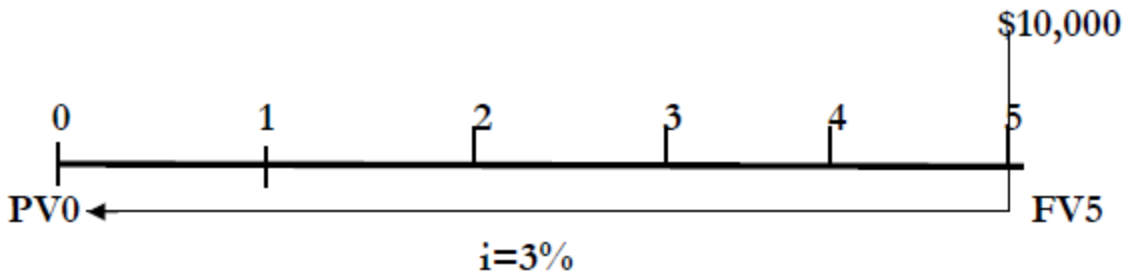
$$FVn = PV\left(1 + \frac{i}{m}\right)^{nXm} \text{ or } PV\ (1 + i)^n$$

Where, FV= Future value, PV= Present Value, i= Interest rate, n= years, and m= times.

- **Example 2**: Mr. Emaran Hashmi deposited $ 5000 in saving account earning 6% interest rate monthly. How much will Emaran money be worth at the end of 10 years?

Single Cash Flow (Present Value)

- **Present value** (PV) is the current value of a future sum of money or stream of cash flows given a specified rate of return.
- You need $10,000 for your tuition expenses in 5 years how much should you deposit today in a saving account that pays 3% per year?

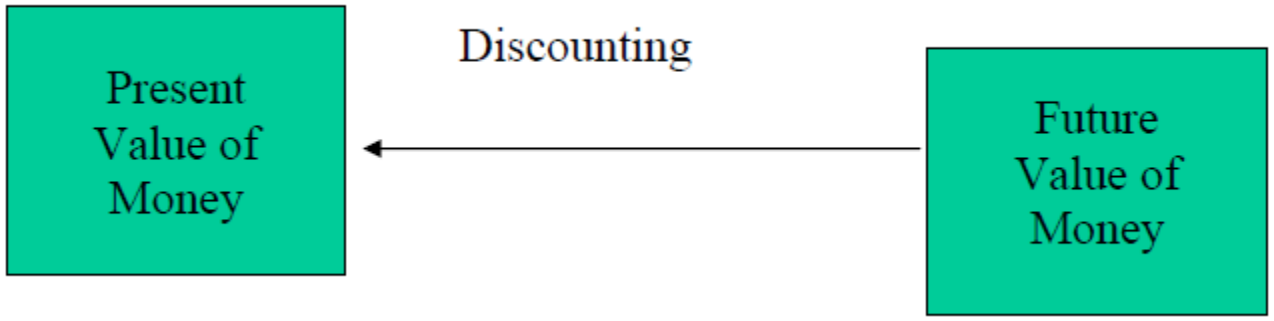


Single Cash Flow (Present Value)

- **Concept of Discounting**

Discounting is the process of converting a value received in a future time period to an equivalent value received immediately.

For example, a dollar received 50 years from now may be valued less than a dollar received today—discounting measures this relative value ?



Single Cash Flow (Present Value)

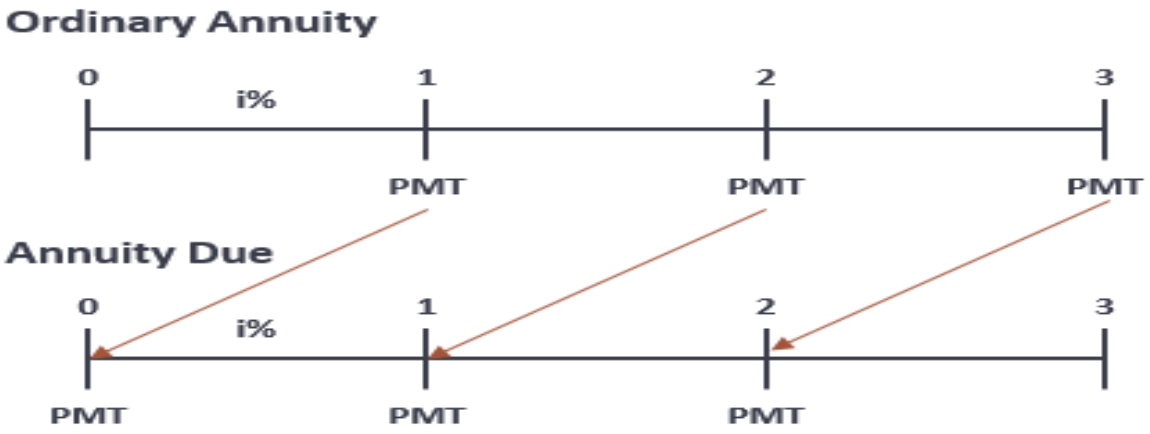
- **Example 3:** Jack need a $1191 in 3 years to give a diamond ring to his girlfriend. How much should jack should put in a saving account that earns 6% today?

$$PVn = \frac{FV}{(1+\frac{i}{m})^{nXm}} \text{ or } PV = \frac{FV}{(1+i)^{n}}$$

- **Example 4:** Suppose you want to buy a Mercedes Benz car for your wife worth 10 lakh dollar after 10 year . How much should your put today in a saving account that pays 10%?

Annuity (Future Value)

- An annuity can be defined as a series of cash flows of the same value occurring at equal intervals. In other words, a series of equal payments at fixed intervals for a specified number of periods.
- **Ordinary annuity**: Cash flows occur at the end of each period. **Annuity due**: Cash flows occur at the end of each period**.**



Annuity (Future Value)

- **Example 5:** Suppose you deposit $100 at the end of each year into a savings account paying 5% interest for 3 years. How much will you have in the account after 3 years? Answer: 1,591.80

$$FVAN_n = PMT\left[\frac{(1+i)^n - 1}{i}\right]$$

- **Example 6:** You agree to deposit $500 at the beginning of each year for 3 years in an investment fund that earns 6%. Calculate the future value ? Answer : 1,687.30

$$FVAND_n = PMT\left[\frac{(1+i)^n - 1}{i}\right](1+i)$$

Annuity (Present Value)

- **Example 7:** You agree to receive $500 at the end of every year for 3 years in an investment fund that earns 6%. Calculate the present value ? Answer: 1336.51

$$PVAN_n = PMT\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$$

- **Example 8:** Now assume that you receive the $500 at the beginning of the year for 3 years in an investment fund that earns 6%. Answer : 1416.70

$$PVAND_n = PMT\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right](1+i)$$

Perpetuity (Annuity)

- A perpetuity is an annuity that continues forever. In other words, a stream of cash flows that goes on forever. The formula of perpetuity when cash flows have zero growth.

$$PVp = \frac{CF}{i} \text{ or } \frac{PMT}{i}$$

- **Example 9:** Let's assume you receive $100,000 from a perpetuity as an annual payment. This is your cash flow. The interest rate for this period is 10%.

- **Example 10**: Let's assume your company invests in a perpetuity with a first-year cash flow of $60,000 and is set to grow at a rate of 3% with an interest rate of 6%.

$$PVp = \frac{CF1}{i-g}$$

Mixed Stream (Future value)

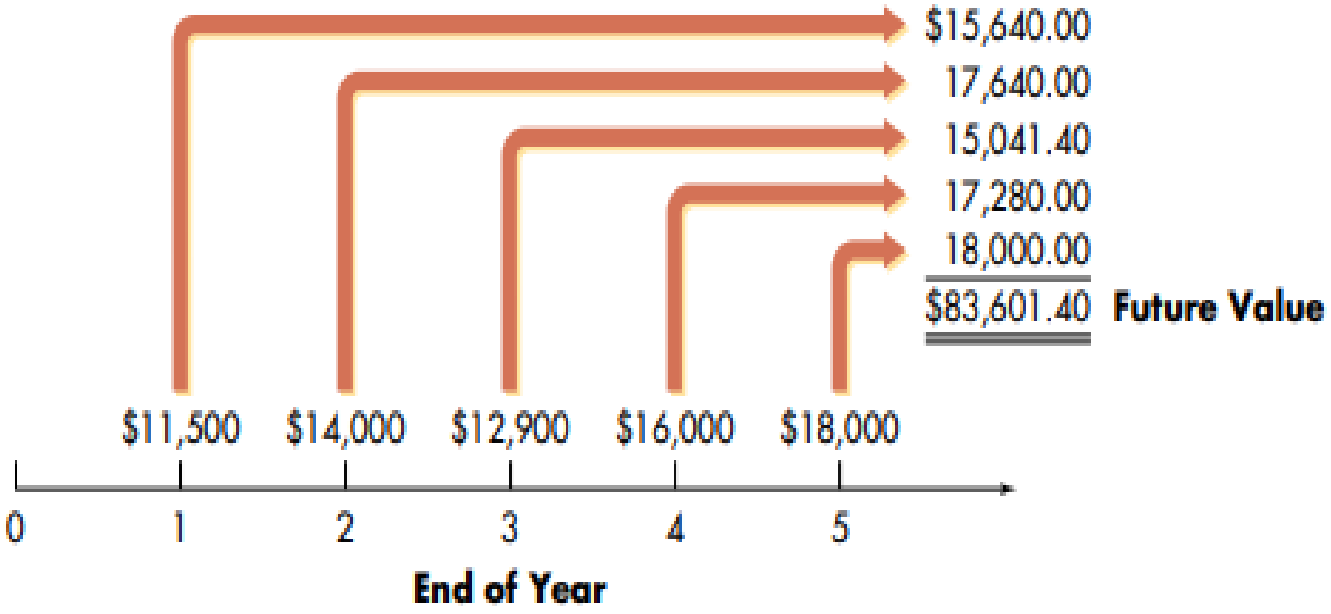
- **Example 11:** ABC company expects to receive the following mixed stream of cash flows over the next 5 years from one of its small customers.

End of year	Cash flow
1	$11,500
2	14,000
3	12,900
4	16,000
5	18,000

If the company expects to earn 8% on its investments, how much will it accumulate by the end of year 5 if it immediately invests these cash flows when they are received?

Mixed Stream (Future value)

- **Solution:**



Mixed Stream (Present value)

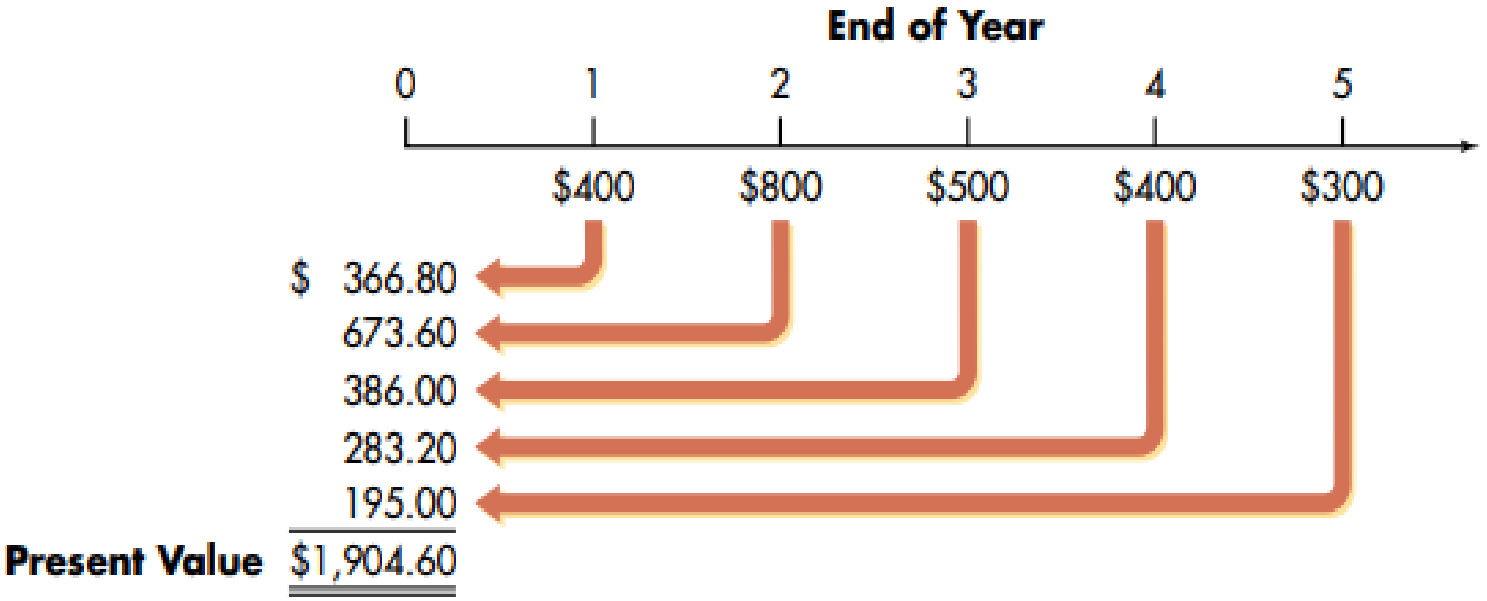
- **Example 12:** Frey Company, a shoe manufacturer, has been offered an opportunity to receive the following mixed stream of cash flows over the next 5 years:

End of year	Cash flow
1	$400
2	800
3	500
4	400
5	300

If the firm must earn at least 9% on its investments, what is the most it should pay for this opportunity? ?

Mixed Stream (Present value)

- **Solution:**



Nominal and Effective Annual Rate

- **Nominal (stated) annual rate**: Contractual annual rate of interest charged by a lender or promised by a borrower.
- **Effective Annual Rate (EAR):** The annual rate of interest actually paid or earned.

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

- **Example 13:** Fred Moreno wishes to find the effective annual rate associated with an 8% nominal annual rate when interest is compounded (1) annually, (2) semiannually, and (3) quarterly.

Nominal and Effective Annual Rate

- Solution:

1. *For annual compounding:*

$$EAR = \left(1 + \frac{0.08}{1}\right)^1 - 1 = (1 + 0.08)^1 - 1 = 1 + 0.08 - 1 = 0.08 = 8\%$$

2. *For semiannual compounding:*

$$EAR = \left(1 + \frac{0.08}{2}\right)^2 - 1 = (1 + 0.04)^2 - 1 = 1.0816 - 1 = 0.0816 = 8.16\%$$

3. *For quarterly compounding:*

$$EAR = \left(1 + \frac{0.08}{4}\right)^4 - 1 = (1 + 0.02)^4 - 1 = 1.0824 - 1 = 0.0824 = 8.24\%$$

Problems For Practice

1. You would like to buy a house that is currently on the market at $85,000, but you cannot afford it right now. However, you think that you would be able to buy it after 4 years. If the expected inflation rate as applied to the price of this house is 6% per year, what is its expected price after four years? ($107,311 ♥)

2. Jack has deposited $6,000 in a money market account with a variable interest rate. The account compounds the interest monthly. Jack expects the interest rate to remain at 8% annually for the first 3 months, at 9% annually for the next 3 months, and then back to 8% annually for the next 3 months. Find the total amount in this account after 9 months. ($6,385.58 ♥)

Problems For Practice

3. You expect to receive $10,000 as a bonus after 5 years on the job. You have calculated the present value of this bonus and the answer is $8000. What discount rate did you use in your calculation?

Thanks

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Week 11, 12 & 13

Chapter: 5 The Cost of Capital

Chapter objectives

At the end of the Chapter, Students will be able to -

- Define the concept of Cost of Capital and understand its importance in financial decision-making.
- Understand how to calculate the cost of debt, considering factors such as interest rates, taxes, and credit ratings.
- Identify and calculate the different components of cost of capital, such as cost of debt, cost of equity, and weighted average cost of capital (WACC).
- Calculate the WACC, which represents the overall cost of capital for a firm considering its capital structure.

Meaning of cost of capital

- The cost of capital is an important financial concept. It links the company's long-term decisions with the wealth of the shareholders as determined in the market place. Whenever, a business organizations raises funds, it has to keep in mind its cost. Hence computation of cost of capital is very important and finance managers must have a close look on it.
- The term cost of capital refers to the minimum rate of return which a firm must earn on its investments so that the market value of the company's equity shares does not fall

Characteristics cost of capital

- i) Cost of capital is a rate of return, It is not a cost as such.
- ii) This return, however, is calculated on the basis of actual cost of different components of capital.
- iii) A firm's cost of capital represents minimum rate of return that will result in at least maintaining (If not increasing) the value of its equity shares.
- iv) It is related to long term capital funds.

Factors Affecting the Cost of Capital

- ✓ General Economic Conditions

  Affect interest rates
- ✓ Market Conditions

  Affect risk premiums
- ✓ Operating Decisions

  Affect business risk
- ✓ Financial Decisions

  Affect financial risk
- ✓ Amount of Financing

  Affect flotation costs and market price of security

Risks related to cost of capital

Return at Zero Risk Level : This refers to the expected rate of return when a project involves no risk whether business or financial.

- **Premium for Business Risk** : Business risk is possibility where in the firm will not be able to operate successfully in the market. Greater the business risk, the higher will be the cost of capital.
- **Premium for Financial Risk** : It refers to the risk on account of pattern of capital structure. In other words, a firm having a higher debt content in its capital structure is more risky as compared to a firm which has a comparatively low debt content.

Importance of cost of capital

The determination of the firm's cost of capital is important from the point of view of the following :

i) It is the basis of appraising new capital expenditure proposals. This gives the acceptance / rejection criterion for capital expenditure projects.

ii) The finance manager must raise capital from different sources in a way that it optimizes the risk and cost factors. The source of funds which have less cost involve high risk. Cost of capital helps the managers in determining the optimal capital structure.

iii) It is the basis for evaluating the financial performance of top management.

iv) It helps in formulating appropriate dividend policy.

Cost of debt

- The formula for computing the Cost of Long Term debt in case of debenture issued at par

  $Kd = (1 - T)\ R$

- Where Kd = Cost of long term debt
- T = Marginal Tax Rate
- R = Interest Rate
- For example, if a company has issued 10% debentures and the tax rate is 50%, the cost of debt will be
- (1 - .5) 10 = 5%

Cost of debt

- In case the debentures are issued at premium or discount, the cost of debt should be calculated on the basis of net proceeds realized. The formula will be as follows :

$$Kd = \frac{I}{NP}(1-T)$$

- Where Kd = Cost of debt after tax
- I = Annual Interest Payment
- NP = Net Proceeds of Loans
- T = Tax Rate

Cost of debt

- Illustration No. 1 : A company issue 10% irredeemable debentures of Rs. 10,000. The company is in 50% tax bracket. Calculate cost of debt capital at par, at 10% discount and at 10% premium .

$$\text{Cost of debt at par} = \frac{\text{Rs. } 1{,}000}{\text{Rs. } 10{,}000} * (1 - .50) = 5\%$$

$$\text{Cost of debt issued at 10\% discount} = \frac{\text{Rs. } 1{,}000}{\text{Rs. } 9{,}000} * (1 - .50) = 5.55\%$$

Cost of debt

- Calculation of debt issued at Premium

$$\text{Cost of debt issued at 10\% premium} = \frac{\text{Rs. } 1{,}000}{\text{Rs. } 11{,}000} * (1 - .50)$$

$$= 4.55\%$$

Cost of Preference Stock

- The preference share represents a special type of ownership interest in the firm. Preference shareholders must receive their stated dividends prior to the distribution of any earnings to the equity shareholders. The cost of preference shares can be estimated by dividing the preference dividend per share by the current price per share, as the dividend can be considered a continuous level payment. The formula of cost of Preference capital is

$$\text{Cost of Preference Capital} = \frac{\text{Dividend}}{\text{Market Price} - \text{Issue Cost}}$$

$$\mathbf{Kp} = \frac{Dp}{Pp - F}$$

Cost of Preference Stock

For example, A company is planning to issue 9% preference shares expected to sell at Rs. 85 per share. The costs of issuing and selling the shares are expected to be Rs. 3 per share.

Solution

The first step in finding out the cost of the preference capital is to determine the rupee amount of preference dividends, which are stated as 9% of the share of Rs. 85 per share. Thus 9% of Rs. 85 is Rs. 7.65. After deducting the floatation costs, the net proceeds are Rs. 82 per share.

Cost of Preference Stock

Thus the cost of preference capital :

$$\frac{7.65}{82}$$

$$= 9.33\%$$

Now, the companies can issue only redeemable preference shares. Cost of capital for such shares is that discount rate which equates the funds available from the issue of preference shares with the present values of all dividends and repayment of preference share capital. This present value method for cost of preference share capital is similar to that used for cost of debt capital, the only difference is that in place of `interest' stated dividend on preference share is used.

Cost of Equity Capital

- "Cost of equity capital is the cost of the estimated stream of net capital outlays desired from equity sources" E.W. Walker.
- James C. Van Horne defines the cost of equity capital can be thought of as the rate of discount that equates the present value of all expected future dividends per share, as perceived by investors.
- Problems measuring the cost of equity

i) The cost of equity is not the out of pocket cost of using equity capital.

Cost of Equity Capital

ii) The cost of equity is based upon the stream of future dividends as expected by shareholders (very difficult to estimate).

iii) The relationship between market price with earnings is known. Dividends also affect the market value (which one is to be considered).

Dividend Growth Rate Method

A method of measuring the cost of common equity which is comparatively more realistic as i) considers future growth in dividends, ii) it considers the capital appreciation. It is also known as Gordons growth model.

$$Ke = \frac{D1}{Po} + g$$

- Where, Po = the current price of the equity share, D1 = dividend expected at the end of year.
- Ke = Cost of equity and G = the constant annual rate growth in dividends and earnings.

Dividend Growth Rate Method

Example 1, The market price of a share of common stock is $60. The dividend just paid is $3, and the expected growth rate is 10%.

$Ke = \frac{3\ (1+0.10)}{60}$ $= 0.155$ $= 15.5\%.$	Here, Do= 3 D1= Do (1+g) = 3(1+0.10) Po= $60 and G= 10% = 0.10

Capital Asset Pricing Model

- The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for pricing risky securities and generating expected returns for assets given the risk of those assets and cost of capital. The formal of CAPM
- $Ke = Rrf + \beta * (Rm - Rrf)$
- **Where:** Ke =Cost of equity.
- Rrf =Risk free rate, Rm=Expected return of the market
- β=The beta of the security
- $(Rm - Rrf)$=Equity market premium

Capital Asset Pricing Model

- **Example 1,** Suppose a stock has the following information. It is listed on the London stock exchange and operates throughout Europe. The yield on a UK 10 year treasury is 2.8%. The stock in question will earn 8.6% as per historical data. The Beta for the stock is 1.4, i.e., it is 140% volatile to the changes in the general stock market.
- **CAPM Formula (**Expected return) = Risk free return (2.8%) + Beta (1.4) * Market risk premium (8.6%-2.8%)
- = 2.8 + 1.4*(5.8)
- = 2.8 + 8.12
- **Expected Rate of Return = 10.92 %**

Cost of Reattained earning

- Some authors do not consider it necessary to calculate separately cost of retained earnings. They say that the cost of retained earnings is included in the cost of equity share capital. They say that the existing share price is used to determine cost of equity capital and this price includes the impact of dividends and retained earnings. There are authorities who also suggest that cost of retained earnings is to be determined separately.
- Cost of Retained Earnings= Ke (1-T) (1-B)

Where T= Shareholder Tax rate

- B= Percentage of brokerage cost .
- Ke= Cost of equity capital based dividend growth model

Cost of Reattained earning

- For example, A firm's cost of equity capital is 12% and tax rate of majority of shareholders is 30%. Brokerage is 3%

Cost of retained earning = 12% (1 – 30%) (1 – 3%)

= 12 * .70 * .97

= 8.15%

Cost of New common stock

- Cost of ***New*** Common Stock
  - Must adjust the Dividend Growth Model equation for floatation costs of the new common shares. The formula is

$$k_n = \frac{D_1}{P_0 - F} + g$$

  - Where, F= Flotation cost

Example, If additional shares are issued floatation costs will be 12%. D_0 = \$3.00 and estimated growth is 10%, Price is \$60 as before.

Cost of New common stock

Solution

$$k_n = \frac{3(1+0.10)}{52.80} + .10$$

$= .1625$

$= 16.25\%$

Weighted Average Cost of Capital

- Weighted cost of capital is also called as composite cost of capital, overall cost of capital, weighted marginal cost of capital, combined cost of debt and equity etc. It comprises the costs of various components of financing. These components are weighted according to their relative proportions in the total capital.

WACC= $k_a = (W_d \times k_d)(1-t) + (WT_p \times k_p) + (W_c \times k_c) + (W_r \times k_r)$

Weighted Average Cost of Capital

Example, Assume that Gallagher's desired capital structure is 40% debt, 10% preferred and 50% common equity and the related cost is 10%, 11.9% and 15%. Calculate WACC?

Solution

- **WACC = .40 x 10% (1-.4) + .10 x 11.9% + .50 x 15%**
  - **= 11.09%**

Marginal cost of capital

The **marginal cost of capital** is defined as the average cost of the extra amount of capital that a company raises to fund its operations. It only accounts for the costs of the additional sources of finance that a company uses. Its amount is determined by the amount of extra capital that a company requires because the amount increases with the increase in the amount of capital that a company raises within a particular period.

WACC is for all projects running by company. If MCC and WACC both are given in the question, I would say choose MCC as MCC is more appropriate for choosing the new project, especially when "optimal" word is given in the question. WACC might not yield the correct decision as it could be either very low or very high.

Some Misconception

i) The concept of cost of capital is academic and impractical.

ii) It is equal to the dividend rate.

iii) Retained earnings are either cost free or cost significantly less than external equity.

iv) Depreciation has no cost.

v) The cost of capital can be defined in terms of an accounting based manner.

vi) If a project is heavily financed by debt, its weighted average cost of capital is low.

- Thanks

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Week 14, 15, & 16

Chapter 6: Capital Budgeting Technique

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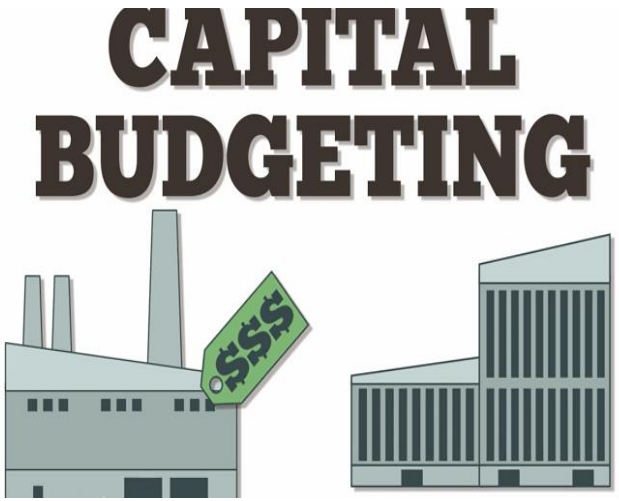
Learning Objectives

At the end of the Chapter, Students will be able to -

- Understand the concept of the capital budgeting.
- Techniques of capital budgeting.
- Evaluate and Calculate Discounting Technique Net present value (NPV), Internal Rate of return (IRR), Profitability Index (PI), Calculation and , interpretation.
- Compare NPV and IRR techniques, conflict in rankings and strengths of each approach.

Concept of Capital Budgeting

- Capital budgeting is the process of evaluating and selecting long-term investments projects that will ultimately maximize the firm's goal of maximizing owner wealth.
- A capital expenditure is an outlay of funds by the firm that is expected to generate benefits over a period of time which is more than one year.



Capital Budgeting Process

- **Proposal for projects**: Proposals for new investment projects are made by finance personnel and key management body.
- **Review and analysis of projects**: Financial managers including key management body perform formal review and analysis to assess the merits and demerits of investment proposals
- **Decision making about proposals**: Firms typically delegate capital expenditure decision making on the basis of capital availability and limits.
- **Selection and implementation**: Following approval and selection, expenditures are made and projects implemented.
- **Follow-up and review process**: Results are monitored and actual costs and benefits are compared with those that were expected. Action may be required if actual outcomes differ from projected ones.

Some basic Concept

- **Independent versus Mutually Exclusive Projects**

☐ Independent projects are those whose cash flows are unrelated to (or independent of) one another; the acceptance or rejection of one does not eliminate the others from further consideration.

☐ Mutually exclusive projects are those that compete with one another, so that the acceptance of one eliminates further consideration all other projects that serve a similar function.

Some basic Concept

Unlimited Funds versus Capital Rationing

- **Unlimited funds** is the situation in which a firm is able to accept all projects that provide an acceptable return.
- **Capital rationing** is the situation in which a firm has only a limited availability of fund for capital expenditures, and have numerous projects compete for investment.

Some basic Concept

Accept-Reject versus Ranking of projects

- An **accept–reject approach** is the evaluation of capital expenditure proposals to determine whether they meet the firm's minimum acceptance criterion or not.
- A **ranking approach** is the process of ranking of capital expenditure projects on the basis of some predetermined measure, such as the rate of return.

Capital Budgeting Methods

Payback Period

The **payback method** is the amount of time required for a firm to recover its initial investment in a project, as calculated from cash inflows. Decision criteria:

- Determination of the length of the maximum acceptable payback period.
- If the calculated payback period of a project is less than the maximum acceptable payback period, accept the project.
- If the payback period of the project is greater than the maximum acceptable payback period, reject the project.

Methods of PBP Calculation

- There are two methods of calculating the PBP.

a) The first method can be applied when the cash inflow is equal. In such a situation the initial cost of the investment is divided by the constant annual cash flow:

$$PBP = \frac{Initial\ Investment}{Constant\ Annual\ Cash\ inflow}$$

Methods of PBP Calculation

B) The second method is used when a project's cash inflows are not equal. In such a situation PBP is calculated by the process of cumulating CFAT till the time when cumulative cash flow becomes equal to the original investment outlays.

PBP= Year before recovery year + (recovery requirement amount /cash inflow of recovery year)

Example of PBP Calculation

ABC Ltd. is a medium sized metal fabricator that is currently contemplating two projects: Project A requires an initial investment of Rs. 42,000, project B an initial investment of Rs. 45,000. The relevant operating cash flows for the two projects are presented in Table I and depicted on the time lines in Figure

Table 1: Capital Expenditure of ABC Ltd.

	Project A	Project B
Initial investment (outflow of cash)	Rs. 42,000	Rs. 45, 000
Year	Operating cash inflows	
1	Rs. 14,000	Rs. 28,000
2	Rs. 14,000	Rs. 12,000
3	Rs. 14,000	Rs. 10,000
4	Rs. 14,000	Rs. 10,000
5	Rs. 14,000	Rs. 10,000

Example of PBP Calculation

For project A,

The payback period is 3.0 years (Rs.42,000 initial investment ÷ Rs.14,000 annual cash inflow).

For Project B

In year 1, the firm will recover Rs.28,000 of its Rs.45,000 initial investment.

By the end of year 2, Rs.40,000 (Rs.28,000 from year 1 + Rs.12,000 from year 2) will have been recovered.

At the end of year 3, Rs.50,000 will have been recovered (28000 year 1+12000 year 2+10000 year 3). But it is more than initial investment which 45000. Therefore PBP= 3+5000/10000 = 3.5 years

Decision Rules

- The PBP can be used as a decision criterion to select investment proposal.
- If the PBP is less than the maximum acceptable payback period, accept the project.
- If the PBP is greater than the maximum acceptable payback period, reject the project.
- This technique can be used to compare actual pay back with a standard pay back set up by the management in terms of the maximum period during which the initial investment must be recovered.
- The standard PBP is determined by management subjectively on the basis of a number of factors such as the type of project, the perceived risk of the project etc.

Merits of PBP

- It is simple both in concept and application and easy to calculate.
- It is a cost effective method which does not require much of the time of finance executives as well as the use of computers.
- It is a method for dealing with risk. It favors projects which generates substantial cash inflows in earlier years and discriminates against projects which brings substantial inflows in later years . Thus PBP method is useful in weeding out risky projects.
- 4. This is a method of liquidity. It emphasizes selecting a project with the early recovery of the investment.

Demerits of PBP

- The major drawback of the payback period is that the appropriate payback period is merely a subjective determined number. – It cannot one to be specified in light of the wealth maximization goal of the firm because it is not based on discounting cash flows to determine whether they add to the firm's value or deteriorated.
- A second weakness is that this approach completely ignore the time factor in the value of money.
- A third weakness of payback is its failure to recognize cash flows that occur after the payback period.

Net Present Value

Net present value (NPV) is a modern capital budgeting technique used by project managers in their analysis; found by subtracting a project's initial investment from the present value of its cash inflows discounted at a rate equal to the firm's cost of capital or required rate of return or hurdle rate which one is preferred by the project manager. Formula is as;

- NPV = Present value of cash inflows – Initial investment

$$NPV = \frac{\text{Cash flow}}{(1+i)^t} - \text{initial investment}$$

where:

$i = \text{Required return or discount rate}$

$t = \text{Number of time periods}$

Decision Rules

- If the NPV is greater than Rs. 0 (Zero), accept the project.
- If the NPV is less than Rs. 0 (Zero), reject the project. If the NPV is greater than Rs.0, the firm will earn a return greater than its cost of capital or required rate of return or hurdle rate which one is preferred by the project manager. Such action should increase the market value of the firm, and therefore the wealth of its owners by an amount equal to the NPV.

NPV Calculation

- **Example 1 (Lum sum)**
- Dexable Inc. is planning a project with an initial investment of $5,000. The investment is projected to generate a cash flow of $5,600 in the next year. What is the NPV assuming that the required rate of return is 10% and there is no salvage value at the end of the project?
- **Solution**

NPV = [$5,600/ (1+0.1) ^1] - $5,000

NPV = $90.90

This NPV shows that the project will be profitable, so managers can accept it.

NPV Calculation

Example 2 (Annuity)

Project R requires an initial investment of $45,000 and is expected to generate $30,000 per year for two years. What is the NPV if the discount rate is 8%?

Solution

To estimate the NPV of this project, you will find the individual NPV of both cash flows and add the results. Then you will deduct the initial investment from the sum of the NPVs.

- NPV of project R = [$30,000/ (1+0.08) ^1] + [$30,000/ (1+0.08) ^2] - $45,000
- NPV = ($27,777.78 + $25,720.17) - $45,000
- NPV = $8,497.95

NPV Calculation

- **Example 3 (Mixed Stream)**
- The initial investment for Project Nathan is $50,000. It is expected to provide revenues of $13,000, $26,000 and $23,000 for the first, second and third years, respectively. What is the NPV for the project if the company's cost of capital is 13%?
- **Solution**
- NPV of Project Nathan = [$13,000/ (1+0.13) ^1] + [$26,000/(1+o.13) ^2] + [$23,000/ (1+0.13)] - $50,000
- NPV = ($11.504.43 + $18,012.37 + $15,940.15) - $50,000
- NPV = $45,456.95 - $50,000
- NPV = -$4,543.05
- The NPV for Project Nathan shows that the investment will result in a loss. Therefore, planners should reject the project.

Internal Rate of Return

- Internal Rate of Return, or IRR, is the rate of return at which a project breaks even and is used by management to evaluate potential investment.
- The **Internal Rate of Return (IRR)** is a sophisticated capital budgeting technique; the discount rate that equates the NPV of an investment opportunity with Rs.0 (Zero) (because the present value of cash inflows equals the initial investment); it is the rate of return that the firm will earn if it invests in the project and receives the given cash inflows.

Internal Rate of Return

- The formula of IRR is Similar to NPV. However, we need to keep in mind that we have to make NPV 0. In order to make the NPV which have to find out the IRR Internal rate of return which will not be given

$$0 = NPV = \sum_{n=0}^{N} \frac{CFn}{(1+IRR)^n}$$

- NPV = Net present value.
- N = Total number of time periods
- n = Time period (*e.g.*, for the first year of a project, n = 1)
- CF0 = Initial investment
- CF1, CF2, CF3, etc. = Cash flows (i.e. income or investments)
- IRR = Internal rate of return

How to calculate IRR

1. Select two estimated discount rates

Before you begin calculating, select two discount rates that you'll use. These are estimates that you'll use to try and set the net present value to zero.

2. Calculate the net present Values

Using the two values you selected in step one, calculate the net present values based on each estimation. You'll want to get as close to zero as you can.

How to calculate IRR

- **3. Calculate the IRR**
- Now that you have your two discount rates and two net present values, begin calculating the IRR. Use the following formula when calculating the IRR:
- **IRR = R1 +** $\left(\frac{NPV1\ (R2-R1)}{(NPV1-NPV2)} \right)$
- Where:
- **R1 = Lower discount rate**
- **R2 = Higher discount rate**
- **NPV1 = Higher Net Present Value**
- **NPV2 = Lower Net Present Value**

Practice of IRR

- Example: Invest $2,000 now, receive 3 yearly payments of $100 each, plus $2,500 in the 3rd year.
- **Let us try 10% interest:**
- Now: PV = **-$2,000**
- Year 1: PV = $100 / 1.10 = **$90.91**
- Year 2: PV = $100 / 1.10^2 = **$82.64**
- Year 3: PV = $100 / 1.10^3 = **$75.13**
- Year 3 (final payment): PV = $2,500 / 1.10^3 = **$1,878.29**
- Adding those up gets:
  - **NPV** = -$2,000 + $90.91 + $82.64 + $75.13 + $1,878.29 = **$126.97**

Practice of IRR

- **Let's try a better guess, say 12% interest rate:**
- Example: (continued) at 12% interest rate
- Now: PV = **-$2,000**
- Year 1: PV = $100 / 1.12 = **$89.29**
- Year 2: PV = $100 / 1.12^2 = **$79.72**
- Year 3: PV = $100 / 1.12^3 = **$71.18**
- Year 3 (final payment): PV = $2,500 / 1.12^3 = **$1,779.45**
- Adding those up gets:
  - **NPV** = -$2,000 + $89.29 + $79.72 + $71.18 + $1,779.45
    = **$19.64**

Practice of IRR

- **Ooh .. so close. Lets try 12.4% ?**
- Example: (continued) at 12.4% interest rate
- Now: PV = **-$2,000**
- Year 1: PV = $100 / 1.124 = **$88.97**
- Year 2: PV = $100 / 1.124^2 = **$79.15**
- Year 3: PV = $100 / 1.124^3 = **$70.42**
- Year 3 (final payment): PV = $2,500 / 1.124^3 = **$1,760.52**
- Adding those up gets:
- **NPV** = -$2,000 + $88.97 + $79.15 + $70.42 + $1,760.52 = **-$0.94**

Practice of IRR

- IRR = R1 + ($\frac{NPV1\ (R2-R1)}{(NPV1-NPV2)}$)

= 0.12+ ($\frac{19.64\ (0.124-0.12)}{(19.64-(-0.94)}$)

= 0.12+ $\frac{0.0785}{20.58}$

= 0.12+ 0.0038

= 0.1238

= 12.38%

Limitations of IRR

- However, there are several limiting factors of IRR.
- IRR is based on estimates, so it should only be used as a guide and in conjunction with other measures that calculate return.
- The rate presents a limited view when comparing investments or projects with different characteristics, such as varying time periods. You cannot accurately compare a project with a one-year duration to another with five years using only IRR.

Profitability Index

- The profitability index (PI), alternatively referred to as value investment ratio (VIR) or profit investment ratio (PIR), describes an index that represents the relationship between the costs and benefits of a proposed project. It is calculated as the ratio between the present value of future expected cash flows and the initial amount invested in the project. A higher PI means that a project will be considered more attractive.
- The PI is calculated by dividing the present value of future expected cash flows by the initial investment amount in the project.
- A PI greater than 1.0 is deemed as a good investment, with higher values corresponding to more attractive projects.
- Under capital constraints and mutually exclusive projects, only those with the highest PIs should be undertaken.

Profitability Index

- $PI = \frac{Present\ Vlaue\ of\ Cash\ Flows}{Intital\ Investment}$ Or
  - $PI = 1 + \frac{Net\ Present\ Value}{Intital\ Investment}$

Calculation of PI

- **Example**

Your company has $100 million available for investment in the following potential investment opportunities: Now rank the project based on PI and suggest what should the company do?

Project	NPV	Initial Investment
A	$5 million	$15 million
B	$15 million	$50 million
C	$10 million	$10 million
D	$20 million	$60 million
E	$12 million	$35 million

Calculation of PI

- **Solution**

Project	Profitability Index	
A	1 + 5/15	= 1.33
B	1 + 15/50	= 1.30
C	1 + 10/10	= 2.00
D	1 + 20/60	= 1.33
E	1 + 12/35	= 1.34

Decision Making

- The ranking based on profitability index is: Project C, Project E, Project A and D and Project B. Now, we need to maximize total net present value that can be achieved using $100 million investment by applying the concept of capital rationing.

THANKS

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Week 17

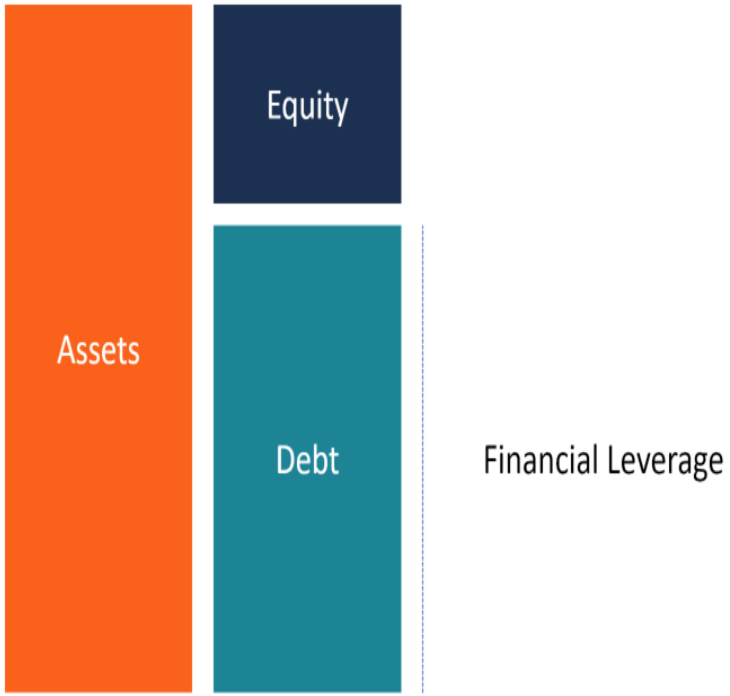
Chapter 7: Leverage

Chapter Objectives

- ✓ Understand the concepts of financial leverage, operating leverage and total leverage
- ✓ Explain the computation process of leverages
- ✓ Assess the behavior and applications of leverages
- ✓ Analysis the relationship between EBIT and EPS
- ✓ Discuss the importance of leverages
- ✓ illustrate various practical problems of leverage

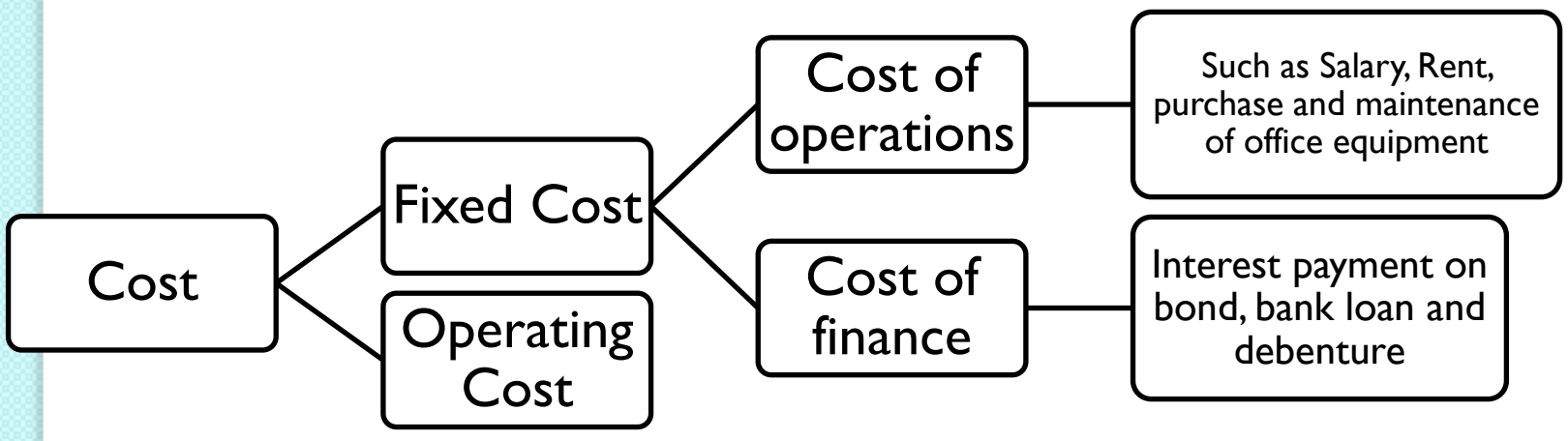
Concept of Leverage

- Leverage is used to describe the firm's ability to use fixed cost assets or funds to magnify the return to its owners.
- **James van Home** has defined leverage, as "**the employment of an asset or funds for which the firm pays a fixed cost or fixed return.**"



Leverage Explanation

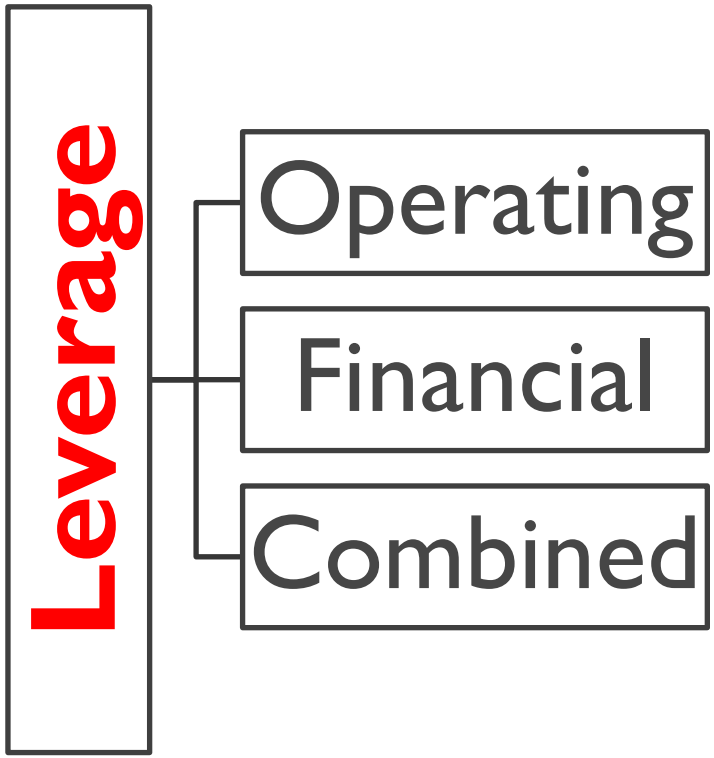
- There are two types of cost in business



Leverage Explanation

- When a firm uses fixed assets, it results in fixed operating costs. Similarly when a firm uses those sources of finance in its capital structure on which it is required to pay fixed cost or fixed rate of interest, it results in fixed financial costs. Higher is the degree of leverage higher is the risk and higher is the expected return and vice versa.
- The leverage can be favorable or unfavorable as the fixed cost or return has to be paid irrespective of the volume of sales, the amount of such cost or return has a significant effect on the profits available for equity shareholders.

Types of Leverage



Types of Leverage

- **Operating leverage :** refers to the use of fixed operating costs such as depreciation, insurance of assets, repairs and maintenance, property taxes etc. in the operations of a firm. But it does not include interest on debt capital. Higher the proportion of fixed operating cost as compared to variable cost, higher is the operating leverage, and vice versa.
- **Financial leverage**: is primarily concerned with the financial activities which involve raising of funds from the sources for which a firm has to bear fixed charges such as interest expenses, loan fees etc. These sources include long-term debt (i.e., debentures, bonds etc.) and preference share capital.
- **Combined Leverage**: Total leverage used by a firm.

Types of Leverage

Sales	xxx	Operating Leverage	Degree of Combined Leverage
Less: Variable Cost	(xxx)		
Contribution	xxx		
Less: Fixed Cost	(xxx)		
Operating Profit/ EBIT	xxx		
Less: Interest	(xxx)	Financial Leverage	
Earnings Before Tax (EBT)	xxx		
Less: Tax	(xxx)		
Profit After Tax (PAT)	xxx		
Less: Pref. Dividend (if any)	(xxx)		
Net Earnings available to equity shareholders/ PAT	xxx		
No. Equity shares (N)			
Earnings per Share (EPS) = (PAT ÷ N)			

Importance of Operating Leverage

- 1. It gives an idea about the impact of changes in sales on the operating income of the firm.
- 2. High degree of operating leverage magnifies the effect on EBIT for a small change in the sales volume.
- 3. High degree of operating leverage indicates increase in operating profit or EBIT.
- 4. High operating leverage results from the existence of a higher amount of fixed costs in the total cost structure of a firm which makes the margin of safety low.
- 5. High operating leverage indicates higher amount of sales required to reach break-even point.
- 6. Higher fixed operating cost in the total cost structure of a firm promotes higher operating leverage and its operating risk..

Importance of Financial Leverage

- 1.It helps the financial manager to design an optimum capital structure. The optimum capital structure implies that combination of debt and equity at which overall cost of capital is minimum and value of the firm is maximum.
- 2. It increases earning per share (EPS) as well as financial risk.
- 3. A high financial leverage indicates existence of high financial fixed costs and high financial risk.
- 4. It helps to bring balance between financial risk and return in the capital structure.
- 5. It shows the excess on return on investment over the fixed cost on the use of the funds.
- 6. It is an important tool in the hands of the finance manager while determining the amount of debt in the capital structure of the firm.

Difference between Operating Leverage and Financial Leverage

- Operating leverage is related to the firm's operating cost structure while Financial leverage is related to the firm's capital structure.
- Operating Leverage is helpful in measuring the business risk of the firm while Financial Leverage is helpful in measuring the financial risk of the firm.
- Operating Leverage is determined by the relationship between Sales revenue and EBIT (Operating Income) of the firm while Financial Leverage is determined by the relationship between EBIT (Operating Income) and EPS (Earning Per Share) of the firm.
- Higher Degree of Operating Leverage (DOL) shows the higher degree of Business risk to the firm while Higher Degree of Financial Leverage (DFL) shows the higher degree of Financial risk of the firm.

Break even Analysis

We know that

Profit= Total Revenue –Total cost

Total Revenue= Price (P) x Quantity Sold (Q)

- Suppose Price per Unit of a Pen= TK 20 and quantity sold 1000 units then Total Revenue = 20x1000= 20,000 TK

Total Cost= Variable cost (VC) + Fixed cost (FC)

- It is important to remember that VC= **Unit variable cost (UVC) x quantity sold (Q)**
- Fixed cost (FC) = Expenses that occurs regardless of any unit of products

Break even Analysis

Now the formula becomes

Profit= (P x Q)–{ (UVC x Q)+ FC}

Suppose, It is given that Selling price of per unit pen is TK 20 and the quantity of pen is sold 1000 units. Where unit variable cost is TK 10 and fixed cost = 4000 TK, Calculate profit, Contribution margin and Break even point ?

We Know,

Profit = (20 x1000)- { (10 x1000)+ 4000}

= 20000-14000

= 6000

Contribution Margin = P-UVC

= 20-10 = 10 TK

Break even Analysis

Break Even Means when Total Revenue = Total cost

Then Break even Quantity = Fixed cost / Contribution margin

- = 4000/10
- = 400 Units

Break even Sales = 400 x 20

= 8000 TK

Degree of Operating Leverage

- The earnings before interest and taxes (i.e., EBIT) changes with increase or decrease in the sales volume. Operating leverage is used to measure the effect of variation in sales volume on the level of EBIT.
- A high degree of operating leverage is welcome when sales are rising i.e., favorable market conditions, and it is undesirable when sales are falling. Because, higher degree of operating leverage means a relatively high operating fixed cost for recovering which a larger volume of sales is required.

$$\text{Degree of operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

Here, contribution = Sales – Variable cost

EBIT = Sales – Variable cost – Fixed cost

Degree of Operating Leverage

- **The degree of operating leverage is also obtained by using the following formula:**
- Degree of operating leverage (DOL) = Percentage change in EBIT / Percentage Change in Units Sold
- The value of degree of operating leverage must be greater than 1. If the value is equal to 1 then there is no operating leverage.

Operating Leverage

- The earnings before interest and taxes (i.e., EBIT) changes with increase or decrease in the sales volume. Operating leverage is used to measure the effect of variation in sales volume on the level of EBIT.
- A high degree of operating leverage is welcome when sales are rising i.e., favorable market conditions, and it is undesirable when sales are falling. Because, higher degree of operating leverage means a relatively high operating fixed cost for recovering which a larger volume of sales is required.

Degree of Financial Leverage

- A degree of financial leverage (DFL) is a leverage ratio that measures the sensitivity of a company's earnings per share (EPS) to fluctuations in its operating income, as a result of changes in its capital structure. The degree of financial leverage (DFL) measures the percentage change in EPS for a unit change in operating income, also known as earnings before interest and taxes (EBIT).

$$\mathrm{DFL} = \frac{\%\text{change in EPS}}{\%\text{change in EBIT}}$$

DFL can also be represented by the equation below:

$$\mathrm{DFL} = \frac{\mathrm{EBIT}}{\mathrm{EBIT} - \mathrm{Interest}}$$

Degree of Combined Leverage

- Degree of combined leverage (DCL) is a leverage ratio that summarizes the combined effect that the degree of operating leverage (DOL) and the degree of financial leverage has on earnings per share (EPS), given a particular change in sales. This ratio can be used to help determine the most optimal level of financial and operating leverage to use in any firm.
- The Formula for the Degree of Combined Leverage is

$$DCL = DOL * DFL$$

$$DCL = \frac{\text{Contribution Margin}}{\text{EBIT}} * \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

Degree of Financial Leverage

- Please calculate the degree of Combined leverage based on the following information-

Describe	Amount
Sale	1,000,000
Total Variable Cost	500,000
Total Fixed Cost	300,000
Interest	100,000
Tax	40%

THANKS

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